

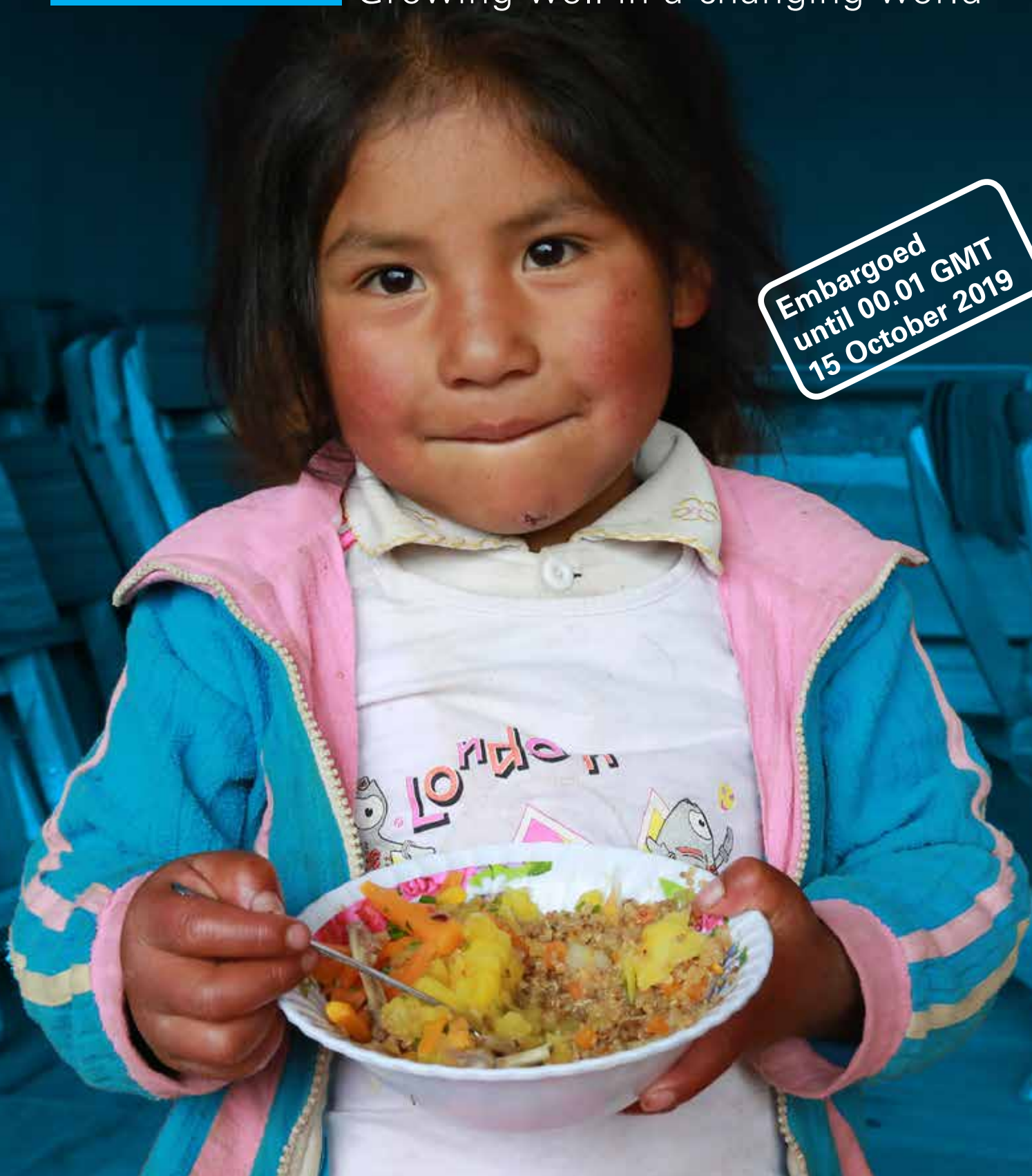
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THE STATE OF THE WORLD'S CHILDREN 2019

Children, food and nutrition

Growing well in a changing world

Embargoed
until 00.01 GMT
15 October 2019



Published by UNICEF since 1980, The State of the World's Children report seeks to deepen knowledge and raise awareness of key issues affecting children and advocates for solutions that improve children's lives.

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Suggested citation: UNICEF (2019). *The State of the World's Children 2019. Children, Food and Nutrition: Growing well in a changing world*. UNICEF, New York.

ISBN: 978-92-806-5003-7

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Cover photo: A girl eats lunch in the Hanaq Chuquibamba community in Peru.
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ACKNOWLEDGEMENTS

This report is the result of collaboration among many individuals and institutions. The report team thanks all who gave so willingly of their time, expertise and energy, in particular:

SENIOR ADVISORY GROUP

Victor M. Aguayo, Francesco Branca, Sandro Demaio, Jessica Fanzo, Lawrence Haddad, Purnima Menon, Ellen Piwoz, Victoria Quinn, Juan Rivera, Meera Shekar, Cesar Victora, Keith West for strategic direction, technical guidance, and policy advice.

INTERNAL ADVISORY GROUP

Yarlina Balarajan, France Begin, Silaja Birks, Luisa Brumana, Lizette Burgers, Stefano Fedele, Alison Fleet, Bernadette Gutmann, Diane Holland, Josephine Ippe, Roland Kupka, Joan Matji, David Matern, Christiane Rudert, Tamara Rusinow, Oren Schlein, Harriet Torlesse, Vilma Tyler, Amirhossein Yarpavar and Noel Marie Zagre for reviewing report drafts and providing guidance and advice.

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PRIVATE FUNDRAISING AND PARTNERSHIPS

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SPECIAL THANKS TO

UNICEF colleagues in Afghanistan, Australia, Bangladesh, China, Egypt, Ethiopia, Ghana, Guatemala, India, Indonesia, Kyrgyzstan, Mexico, Nigeria, Philippines, Serbia, the Sudan, the United States and Zimbabwe for facilitating *The State of the World's Children* workshops.

Alex Cadillo, Carolyn McCaffrey, Hugo Razuri, Carlos Rojas, Maria Elena Ugaz, Ines Villar and Marilu Wiegold, in Lima, Peru; Stephen Barrett, Marianne Clark-Hattingh, Maryam Halim, Zouhair Rosli, Marc Vergara and Faradiza Zahri, in Kuala Lumpur, Malaysia; Mx Balibago, Maria Evelyn Carpio, Mariella Castillo, Zafrin Chowdhury, Rene Galera, Wigdan Madani and Julia Rees, in Manila, Philippines; and Jee Hyun Rah and Kate Rose in Jakarta, Indonesia, for their patience, support and good humour during *The State of the World's Children* report team's site visits.

UNICEF colleagues in Bangladesh, Belize, Brazil, Burkina Faso, Cameroon, the Central African Republic, Côte d'Ivoire, El Salvador, France, Ghana, Indonesia, Liberia, Malawi, Malaysia, Mali, Mexico, Moldova, Myanmar, Nigeria, Sierra Leone, South Africa, Eswatini, Syria, Thailand, Tunisia, the United Kingdom, Ukraine, Vietnam and Zimbabwe for participating in *The State of the World's Children* U-Report Poll, and UNICEF Global Innovation Centre for carrying out and analysing the SOWC U-Report Poll.

Alejandro Calvillo Unna, Hilal Elver, Inge Kauer, Peter Bakker, Sania Nishtar, Scholastica Nguli, Sherrie Westin and Raya for participating in the *Perspectives* essay series, and to Viktoria Aberg, Hallie Ruvin, Moria Moderelli, Mark Wjine, Marisa Macari, Alison Cairns, Kristin Heume and Melissa Shapiro for their help with these essays.

Elyse Champaigne-Klassen, Catharine Fleming, Girish Lala, Virginia Schmied and Amanda Third from Western Sydney University for their work designing the methodology and analysing the results from *The State of the World's Children* workshops held globally for this report; and Peggy Koniz-Booher and Rafael Perez-Escamilla, who served on the project's Advisory Group.

Derek Headey for contributing to the development of the box on food pricing and nutrition, based on *The relative caloric prices of healthy and unhealthy foods differ systematically across income levels and continents* by Derek D. Headey and Harold H. Alderman.

The UNICEF Office of Research-Innocenti, the Global Alliance for Improved Nutrition, the Nutrition Section of UNICEF's Programme Division and attendees at the Food Systems for Children and Adolescents consultation, Florence, 5–7 November, 2018.

Ian Au, Jose Cuesta, Tara Dooley, Elizabeth Fox, Nada Hamadeh, Jens-Christian Holm, Sue Horton, Priscilla Idele, Achila Imchen, Faizal Karmali, Manmeet Kuar, Joseph Pell Lombardi, Makmende Media, Takaaki Masaki, William Masters, David Nabarro, Dan Parker, Marko Olavi Rissanen and The World Business Council for Sustainable Development for their help and support.

Lisa Rogers from WHO for providing original data used in this report.

UNICEF recognizes the support of the Kingdom of the Netherlands and of Norway for this report.

***The State of the World's Children* report is produced by the Office of Global Insights and Policy**
Laurence Chandy, *Director*.



THE STATE OF THE WORLD'S CHILDREN 2019

CHILDREN, FOOD AND NUTRITION

Growing well in a changing world

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Foreword



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In the spoonful a mother or father feeds to a toddler, food is love. In the feast a family cooks for a child’s coming of age, food is community. In the shouts and laughter of teenagers sharing snacks after school, food is joy. And for every child and young person everywhere, food is life – a fundamental right and a foundation of healthy nutrition and sound physical and mental development.

Sadly, as this *State of the World’s Children* report shows, far too many of our children and young people are not getting the diets they need, which is undermining their capacity to grow, develop and learn to their full potential. That hurts not just individual children and young people, it hurts us all.

This situation forces us to ask some difficult questions: How is it in the 21st century that we still have 149 million children under 5 with stunting and almost 50 million with wasting? How is it possible that overweight and obesity in children and young people are continuing to rise, and increasingly among the poor? And why are healthy diets becoming more expensive while unhealthy, non-nutritious diets are becoming cheaper?

Nutrition has long been at the core of UNICEF’s work. In 2018, we helped provide life-saving therapeutic feeding for 4.1 million children with severe acute malnutrition; we improved the quality of diets for over 15.6 million children through home-based fortification; we supported programmes to prevent anaemia and other forms of malnutrition for 58 million adolescent girls and boys; and we ensured that over 300 million children received services for the prevention of stunting and other forms of malnutrition.

Nutrition has also long been key to our thought leadership. In 1990, our pioneering malnutrition framework broke new ground in setting out the multiple causes of poor nutrition. In 2019, we have rethought our framework to emphasize what creates good nutrition – from the diets of children and women to the care they benefit from, the food environments in which they live, and the ways in which our societies underpin the right to adequate nutrition through our values and political commitment. Each of these determinants presents an opportunity to improve the nutrition of our children, young people and women.

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As Executive Director of UNICEF and Chair of the Lead Group of the Scaling Up Nutrition Movement, I want to emphasize again my commitment, and the commitment of UNICEF, to use all of these opportunities to work for better nutrition for every child, especially in the crucial first 1,000 days – from conception to age two years – and during adolescence, the two unparalleled windows of opportunity. We are underscoring this commitment by launching this report along with UNICEF’s new nutrition strategy, which sets out our priorities and plans to improve the nutrition of children, young people and women, in the years to come.

We already know so much of what works to prevent malnutrition in all its forms, from conception, through early childhood and into adolescence. But this is a battle we cannot win on our own. It needs the political determination of national governments, backed by clear financial commitments, as well as policies and incentives that encourage the private sector’s investment in nutritious, safe and affordable food for children, young people, women and families. And, increasingly, it needs a determination to make children’s nutrition a priority across not just the food system but also in the health, water and sanitation, education

and social protection systems. Success in each of these supports success in all.

Young people and women know the value of good nutrition and eating well. “Eating healthily is being responsible for your own health,” said a 16-year-old girl in China during one of more than 70 workshops organized for this report. In India, a 13-year-old girl told us that “food is important for us so that we are able to study well.” They are clear, too, on the barriers to healthy nutrition: “I don’t have enough money to buy food for me and my baby,” a 20-year-old mother said in Guatemala; “I lack knowledge about what kinds of food are healthy,” an 18-year-old girl said in Zimbabwe.

Good nutrition paves the way for a fair chance in life. Let us work together to lower these barriers and to ensure that every child, young person and woman has the nutritious, safe, affordable and sustainable diets they need at every moment of life to meet their full potential.



Henrietta H. Fore
UNICEF Executive Director



A child sells snacks to other children outside a clinic in Gaza City, State of Palestine. © UNICEF/UN068011/EI Baba

Children, food and nutrition | Growing well in a changing world

Key Messages

At least 1 in 3 children under 5 is undernourished or overweight and 1 in 2 suffers from hidden hunger, undermining the capacity of millions of children to grow and develop to their full potential.

- Globally, at least 1 in 3 children under 5 is not growing well due to malnutrition in its more visible forms: stunting, wasting and overweight.
- Globally, at least 1 in 2 children under 5 suffers from hidden hunger due to deficiencies in vitamins and other essential nutrients.
- Undernutrition continues to exert a heavy toll. In 2018, almost 200 million children under 5 suffered from stunting or wasting while at least 340 million suffered from hidden hunger.
- Overweight and obesity continue to rise. From 2000–2016, the proportion of overweight children (5 to 19 years old) rose from 1 in 10 to almost 1 in 5.
- The number of stunted children has declined in all continents, except in Africa while the number of overweight children has increased in all continents, including in Africa.

The triple burden of malnutrition – undernutrition, hidden hunger and overweight – threatens the survival, growth and development of children, young people, economies and nations.

- Stunting – a clear sign that children in a country are not developing well – is both a symptom of past deprivation and a predictor of future poverty.
- Wasting can be lethal for children, particularly in its most severe forms. Contrary to common belief, most wasted children around the world live in Asia and not in emergency settings.
- Hidden hunger harms children and women. Iron deficiency reduces children's ability to learn and iron deficiency anaemia increases women's risk of death during or shortly after childbirth.
- Child overweight can lead to early onset of type-2 diabetes, stigmatization and depression, and is a strong predictor of adult obesity, with serious health and economic consequences.
- The greatest burden of all forms of malnutrition is shouldered by children and young people from the poorest and most marginalized communities, perpetuating poverty across generations.

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The triple burden of malnutrition is driven by the poor quality of children's diets: 2 in 3 children are not fed the minimum recommended diverse diet for healthy growth and development.

- Only 2 in 5 infants under six months of age are exclusively breastfed, as recommended. Breastfeeding could save the lives of 820,000 children annually worldwide.
- Use of breastmilk substitutes is of concern. Sales of milk-based formula grew by 41 per cent globally and by 72 per cent in upper middle-income countries such as Brazil, China and Turkey from 2008–2013.
- Poor diets drive malnutrition in early childhood: 44 per cent of children aged 6 to 23 months are not fed fruits or vegetables and 59 per cent are not fed eggs, dairy, fish or meat.
- Only 1 in 5 children aged 6 to 23 months from the poorest households and rural areas is fed the minimum recommended diverse diet for healthy growth and brain development.
- Many school-going adolescents consume highly processed foods: 42 per cent drink carbonated soft drinks at least once a day and 46 per cent eat fast food at least once a week.
- Poor families tend to select low-quality food that costs less. Because of poverty and exclusion, the most disadvantaged children face the greatest risk of all forms of malnutrition.
- Climate shocks, loss of biodiversity, and damage to water, air and soil are worsening the nutritional prospects of millions of children and young people, especially among the poor.
- UNICEF and its partners treated more than 3.4 million children with severe malnutrition in humanitarian settings in 2018, from Afghanistan and Yemen to Nigeria and South Sudan.

Globalization, urbanization, inequities, humanitarian crises and climate shocks are driving unprecedented negative changes in the nutrition situation of children around the world.

- Globalization is shaping food options and choices: 77 per cent of processed food sales worldwide are controlled by just 100 large firms.
- In cities, many poor children live in 'food deserts', facing an absence of healthy food options, or in 'food swamps', confronted with an abundance of high-calorie, low-nutrient, processed foods.
- Improving children's nutrition requires food systems to deliver nutritious, safe, affordable and sustainable diets for all children.
- Millions of children are eating too little of what they need, and millions are eating too much of what they don't need: poor diets are now the main risk factor for the global burden of disease.
- National food systems must put children's nutrition at the heart of their work because their nutritional needs are unique and meeting them is critical for sustainable development.
- Financial incentives should be used to reward actors who increase the availability of healthy and affordable foods in markets and other points of sale especially in low-income communities.
- Financial disincentives on unhealthy foods can improve children's diets. For example, taxes on sugary foods and beverages can reduce their consumption by children and adolescents.
- Fortification of complementary foods and staple foods with micronutrients can be a cost-effective intervention to combat hidden hunger in children, young people and women.

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Food environments are crucial. When healthy options are affordable, convenient and desirable, children and families make better food choices

- Children, adolescents, young people, parents and families need support to demand nutritious foods, but food environments need to promote and support healthy diets.
- Innovative, fun, memorable and engaging communication strategies to promote healthy eating can leverage the cultural and social aspirations of children, adolescents and families.
- Legislation plays a key role in promoting good diets for children, such as by regulating the marketing of breastmilk substitutes to mothers and families, and of unhealthy food to children.
- The marketing of unhealthy foods and sugar-sweetened beverages is directly linked to growing overweight and obesity in children.
- Front of package labelling – visible, accurate and easy to understand – helps children, young people and families make healthier food choices and incentivizes suppliers to deliver healthy food.
- Governments need to promote healthy food environments in schools, including healthy meals and limiting the sale and advertising of 'junk food' in proximity to schools and playgrounds.
- The health, water and sanitation, education and social protection systems also have crucial roles to play in promoting and supporting good nutrition for children, adolescents and women.

Improving children's nutrition requires food systems to deliver nutritious, safe, affordable and sustainable diets for all children.

- Investing in child nutrition is key to human capital formation because nutrition is central to children's growth, cognitive development, school performance and future productivity.

- A large and young labour force – with a great creativity and productivity potential – is emerging in Africa and Asia. However, malnutrition risks limiting this demographic dividend.
- Returns from investment in nutrition are high. For example, every dollar invested in reducing stunting generates an economic return equivalent to about US\$18 in high-burden countries.

One word must be at the heart of our response to children's malnutrition – action. We need action that reflects the core role of food systems, that strengthens the supply of – and demand for – better food, that improves children's food environments, and leverages the role of key supportive systems.

With action comes another imperative: accountability. Progress must be measured, shared, acted on and celebrated. Sound nutrition is fundamental to children's well-being and the achievement of the Sustainable Development Goals. It needs to be put at the heart of government policy and supported by key stakeholders, including civil society and the private sector.

The State of the World's Children 2019 report concludes with the following **Agenda to Put Children's Nutrition Rights First:**

- 1 Empower families, children and young people to demand nutritious food.
- 2 Drive food suppliers to do the right thing for children.
- 3 Build healthy food environments for all children.
- 4 Mobilize supportive systems – health, water and sanitation, education and social protection – to scale up nutrition results for all children.
- 5 Collect, analyse and use good-quality data and evidence regularly to guide action and track progress. ■



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How the triple burden of malnutrition harms children, adolescents and women

● **Undernutrition: stunting and wasting**

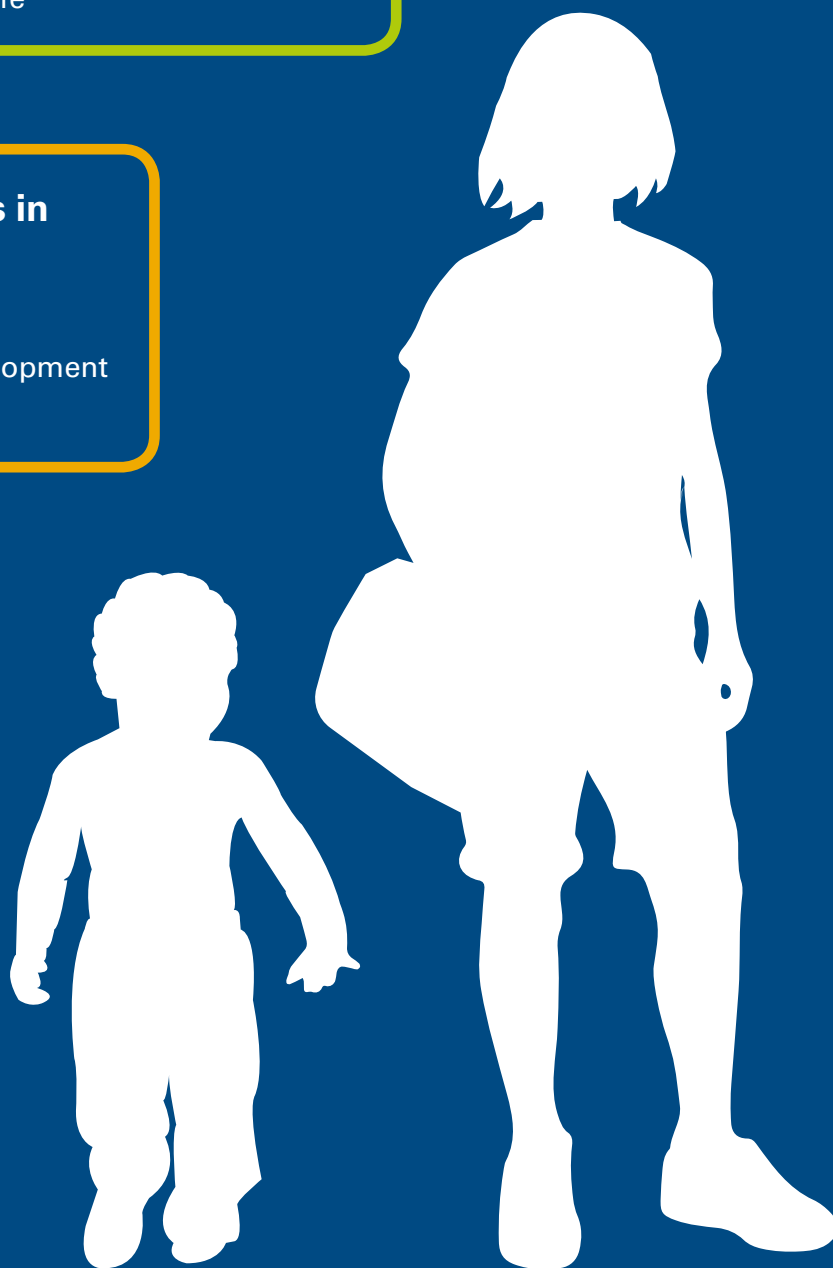
- Poor growth, infection and death
- Poor cognition, school-readiness and school performance
- Poor earning potential later in life

● **Hidden hunger: deficiencies in micronutrients**

- Poor growth and development
- Poor immunity and tissue development
- Poor health and risk of death

● **Overweight (including obesity)**

- Short-term: cardiovascular problems, infections and poor self-esteem
- Long-term: obesity, diabetes, and other metabolic disorders



CHILDREN AND ADOLESCENTS



PREGNANT WOMEN

● **Undernutrition: stunting and underweight**

- Perinatal complications
- Prematurity and low birth weight
- Chronic diseases for child in later life

● **Hidden hunger: deficiencies in micronutrients**

- Maternal mortality and morbidity
- Neural tube defects in newborns
- Prematurity, low birth weight and impaired cognitive development in newborns

● **Overweight (including obesity)**

- Gestational diabetes and pre-eclampsia
- Obstetric complications
- Overweight and chronic disease for child in later life



149 million children under-5 stunted

+



Almost 50 million children under-5 wasted

+



40 million children under-5 overweight

=



More than 1 in 3 children not growing well



Over 340 million children suffering from deficiencies of essential micronutrients (vitamins and minerals)

=



At least 1 in 2 children with hidden hunger

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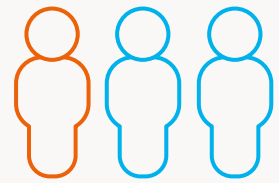


Introduction

GROWING WELL IN A CHANGING WORLD

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At least one in three children is not getting the nutrition they need to grow well, particularly in the crucial first 1,000 days – from conception to the child's second birthday – and often beyond. An increasing number of children and young people are surviving, but far too few are thriving because of malnutrition. To meet the challenges of the 21st century, we need to recognize the impact of forces like urbanization and globalization on nutrition, and focus increasingly on using local and global food systems to improve the diets of children, young people and women.



- Globally, at least 1 in 3 children is not growing well due to malnutrition in its more visible forms: stunting, wasting and overweight. At least 1 in 2 suffers from hidden hunger due to deficiencies – often not visible – in essential nutrients.
- This triple burden of malnutrition – undernutrition, hidden hunger and overweight undermines children's health and physical and cognitive development.
- Food systems are key: They need to provide children and young people with diets that are nutritious, safe, affordable and sustainable.

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mal·nu·tri·tion
/, maln(y)oo'triSH(ə)n/
noun

lack of proper
nutrition, caused by
not having enough
to eat, not eating
enough of the right
things, or being un-
able to use the food
that one does eat

Bad diets across
the population are
now the leading
cause of death
worldwide

A changing world

It is 20 years since *The State of the World's Children* report last examined children's nutrition. In that time, much has changed.

We have changed where we live: more and more families have left the farm and the countryside behind and have moved to cities, a global shift that will only grow in the years to come.

We have changed our roles. In societies around the world, women are increasingly joining the formal workforce, balancing work responsibilities with their role as primary caregivers, and often with little support from families, employers or society at large.

The conditions of life on our planet have changed. The crisis of climate change, the loss of biodiversity, and the damage done to water, air and soil, now raise concerns over whether we can feed this generation of children sustainably, never mind the generations to come.

Finally, we have changed what we eat. We are leaving behind traditional and indigenous diets and embracing modern diets that are frequently high in sugars and fats, low in essential nutrients and fibre, and often highly processed.

This is the backdrop to children's malnutrition today. As with so much else, it, too, is changing. A word once inextricably linked in the public's mind with images of hunger and famine, malnutrition must now be used to describe a much broader swathe of children – children with stunting and wasting, but also those suffering from the hidden hunger of deficiencies in essential vitamins and minerals, as well as the growing numbers of children and young people who are overweight or obese.

These are the children who are not growing well.

Their numbers are worryingly high (see *Figure A.1*). Globally, at least one in three children under the age of 5 is stunted, wasted or overweight and, in some cases, suffers from a combination of two of these forms of malnutrition. Further, at least one in two children suffers from hidden hunger due to deficiencies – often not visible – in vitamins and essential nutrients, which can harm survival, growth and development at every stage of life.

Malnutrition – a triple burden

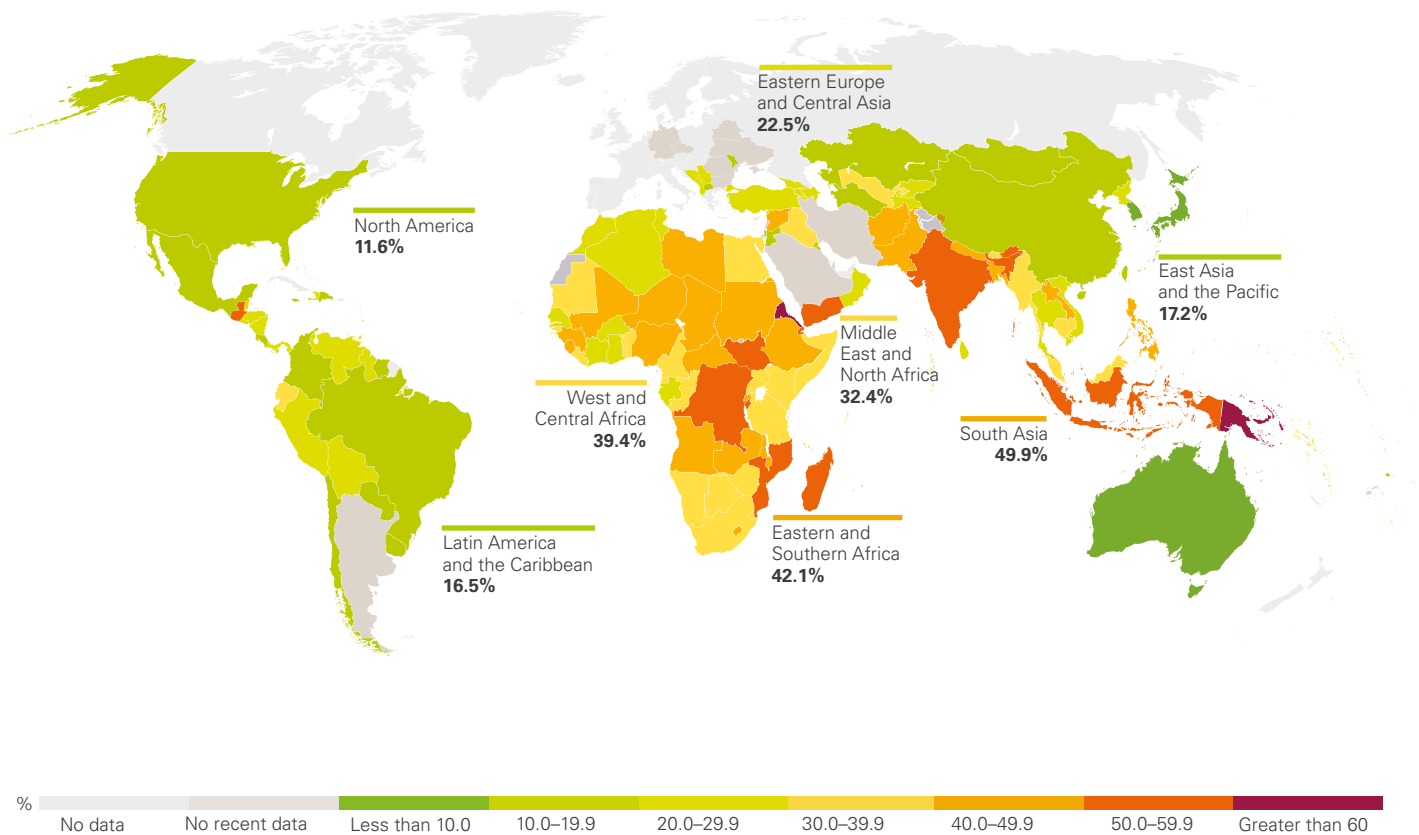
The children who are not growing well are the victims of the three strands of the triple burden of malnutrition that is rapidly emerging in communities around the world, including in some of the world's poorest countries.

The first strand is **undernutrition**. Despite some declines, undernutrition continues to affect tens of millions of children. Its presence is visible in the stunted bodies of children deprived of adequate nutrition in the crucial first 1,000 days – from conception to the child's second birthday – and often beyond. These children may carry the burden of early stunting for the rest of their lives and may never meet their full physical and intellectual potential. Undernutrition is also evident in the wasted bodies of children at any stage of life when circumstances such as food shortages, poor feeding practices and infection, often compounded by poverty, humanitarian crises and conflict, deprive them of adequate nutrition and, in far too

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Where are children not growing well?

FIGURE A.1 | Prevalence of children under 5 who are not growing well (stunted, wasted or overweight), 2018



1 in 3 children
worldwide under
the age of 5 is not
growing well



Note: Country data are the most recent available estimate between 2006 and 2018; where only data prior to 2000 are available, the dark grey color denoting no recent data is used. The designations employed in this publication and the presentation of the material do not imply on the part of the United Nations Children's Fund (UNICEF) the expression of any opinion whatsoever concerning the legal status of any country or territory, or of its authorities or the delimitations of its frontiers.

'Growing well' is defined as free from stunting, wasting and overweight. See Note on Figures on p. 179 for more information.

Source: UNICEF analysis of UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates, 2019 edition. *Levels and trends in child malnutrition: Key findings of the 2019 edition of the Joint Child Malnutrition Estimates.*

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More children and young people are surviving, but far too few are thriving

many cases, result in death. In 2018, 149 million children under 5 were stunted and almost 50 million were wasted.

The second strand of malnutrition is **hidden hunger**. Deficiencies of essential vitamins and minerals – often referred to as micronutrients – rob children of their vitality at every stage of life and undermine the health and well-being of children, young people and women. This heavy toll is made all the more insidious by the fact that hidden hunger is rarely noticed until it is too late to do anything. The numbers of children affected by hidden hunger are striking. Based on the most recent data available, UNICEF estimates that at least 340 million children under 5 suffer from micronutrient deficiencies.¹

The third strand is **overweight** and, in its more severe form, obesity. The numbers of obese girls and boys between the ages of 5 and 19 have soared since the mid-1970s, rising by between 10- and 12-fold globally.² Overweight, long thought of as a condition of the wealthy, is now increasingly a condition of the poor, reflecting the greater availability of ‘cheap calories’ from fatty and sugary foods in almost every country in the world. It brings with it a heightened risk of non-communicable diseases, such as type 2 diabetes and coronary heart disease. Analysis carried out as part of the Global Burden of Disease study suggests that diets lacking adequate nutrition are now the leading cause of death worldwide.³

Behind all these numbers are the real lives of the children and women. They are the toddlers like Moteab, who, like hundreds of thousands of other children in Yemen, has had to fight for his life from severe wasting. Moteab survived, but many other children living through

conflicts and humanitarian crises around the world have not. They are the infants like Joemar in the Philippines, who live far from warzones but who also suffer from severe wasting. They are the children of mothers like Uruma in Tanzania, who go to school on an empty stomach because their parents cannot afford to buy food. They are the teens like Zahfa in Indonesia, who get too little time to exercise and who are surrounded by unhealthy food options. And they are the mothers like Xaiathon in rural Laos, who must balance breastfeeding her child and feeding her family with the demands of working on a farm.

Surviving, but not thriving

The state of children’s malnutrition in the 21st century can be summed up like this: more children and young people are surviving, but far too few are thriving. They are not thriving in the crucial first 1,000 days, when the foundations for healthy, lifelong physical growth and mental development are laid. And they are not thriving at other crucial development stages of life across childhood and into adolescence.

Malnutrition has many causes. A mother’s nutritional status, for example, profoundly affects her child’s survival, growth and development, as does the child’s feeding in the first hours and days of life. For far too many children, the causes of malnutrition also include poor access to essential health services and to clean water and adequate sanitation, which can lead to illnesses that prevent the child from absorbing nutrients (*see Chapter 3*).

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But to understand malnutrition, there is an increasing need to focus on food and diet, and at every stage of the child's and young person's life. The picture that emerges is a troubling one: **far too many children and young people are eating too little healthy food and too much unhealthy food.**

These problems start early on. In their first six months, only two out of five children are being exclusively breastfed, depriving them of the best food a baby can get. When it comes to the 'first foods' (or complementary foods) that infants should start consuming at around the age of 6 months, these too are, in far too many cases, not meeting children's needs. Fewer than one in three children between 6 and 23 months is eating the diverse diet that can support their rapidly growing bodies and brains. For the poorest children, the proportion falls to only one in five. Among older children, low consumption of fruits and vegetables is widespread.⁴ This is true, too, of many adolescents, many of whom also regularly miss or skip breakfast and consume soft drinks and fast food.⁵

The diets of children today increasingly reflect the global 'nutrition transition', which is seeing communities leave behind often more healthy, traditional diets in favour of modern diets.⁶ For many families, especially poorer families, this means an increasing reliance on highly processed foods, which can be high in saturated fat, sugar and sodium and low in essential nutrients and fibre, as well as on 'ultra-processed' foods, which have been characterized as formulations containing little or no whole food and which are extremely palatable, highly energy dense, and low in essential nutrients.⁷ Often missing from these diets are whole grains, fruit, nuts and seeds, vegetables, and omega-3 fatty acids.⁸

There is increasing concern about the impact of these diets on human health. Much of the focus is on rising overweight and obesity, but modern diets are also implicated in undernutrition. In Nepal, a recent study suggested that children under 2 may be getting on average a quarter of their energy intake from items such as biscuits, instant noodles and juice drinks, which is lowering their intake of essential vitamins and minerals. Children eating the most of these sorts of snacks and beverages were shorter than their peers.⁹

A greater focus on food systems

Health impacts are not the only concern around modern diets. In a world facing multiple environmental crises, there is also concern about the sustainability of these diets. Food production accounts for almost a third of greenhouse gas emissions and 70 per cent of fresh water use, and current modes of food production are the leading cause of environmental change.¹⁰ Climate-related shocks, such as flooding, are already challenging the capacity of some communities to feed themselves and are exposing children to increased risk from waterborne diseases. If current trends continue, the impact of food production on the environment will only grow, with food demand set to increase by at least half by mid-century.¹¹ This demand will have to be satisfied against the backdrop of a world that, after decades of decline, is seeing a slow rise in hunger, with 820 million people suffering from undernourishment in 2018.¹²

In response to these challenges, and in this UN Decade of Action on Nutrition,

Far too many children and young people are eating too little healthy food and too much unhealthy food

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To make food systems work better for children, we need to understand the unique nutritional needs of children at every stage of life

there is a growing focus on the role of **food systems** – all the elements and activities involved in the “production, processing, distribution, preparation and consumption of food” as well as the outcomes of these activities, including nutrition and health.¹³ In other words, everything and everyone involved in bringing food ‘from farm to mouth’.

Food systems are becoming more complex. More food now crosses borders, and production is concentrated in the hands of a relatively small number of businesses – just 100 large firms account for 77 per cent of processed food sales worldwide.¹⁴ For families around the world, business is playing a growing role in providing the food they eat and, through marketing, in shaping what they want to eat and their aspirations. Understanding how food systems work is essential to improving our diets.

Far too often, the interests of a very important group of people are left out of food systems analysis – children. This is a dangerous omission. Children are a unique group. Poor diets have lifelong impacts on their physical growth and brain development. That is why they must be at the heart of our thinking about food systems. **If food systems deliver for children, they are delivering for us all.**

Making food systems work for children

Thirty years ago, the Convention on the Rights of the Child spoke of the need to provide children with “adequate nutritious foods” to

combat malnutrition and disease. That goal has not changed. What has changed are the contexts in which this needs to happen, and the realization that food systems are a key – and underappreciated – part of the puzzle.

To make food systems work better for children, we need to understand the **unique nutritional needs of children** at every stage of life, particularly in the first 1,000 days – but also on day 1,001, and then on through the school years, when a well-nourished child can focus better and learn more in the classroom, and throughout the vital years of adolescence, when physical and mental development again speeds up and when lifelong eating habits are established.

To make food systems work better for children, we need to understand the rapidly evolving contexts that are shaping and reshaping children’s diets. Climate change, urbanization and globalization are profoundly altering how and what children eat, as well as the social and cultural values we attach to food.

To make food systems work better for children, we need to respond to the challenges children, young people, women and families are facing around the world – food deserts, the high cost of healthy foods, time pressures, the limited availability of nutrient-rich foods, including fruits and vegetables – and the pressure many children, adolescents and families feel from marketing and advertising.

To make food systems work better for children, we need to address the scandal of child labour in agriculture and food production, much of which is hazardous. In 2016, 108 million

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children aged between 5 and 17 were engaged in agricultural labour, accounting for 71 per cent of all child labour.¹⁵

And to make food systems work better for children, we need to ensure food systems work with, and are not undermined by, all the other systems that affect children's lives. The health, water and sanitation, education and social protection systems must all work together to provide children and their families with the knowledge, support and services they need to ensure that nutritious diets translate into better growth and development.

When food systems work better for children, we all benefit. Good nutrition can break the vicious intergenerational cycles through which malnutrition perpetuates poverty, and poverty perpetuates malnutrition. Children who are well nourished have a firm foundation from which they can develop to their full potential. When children do that, societies and economies develop better, too.^{16, 17}

Our goal must be to give children diets that are **nutritious, safe, affordable** and **sustainable**. ■

A father carries his daughter of 7 months through a grocery store in Maitland, Cape Town, South Africa. © UNICEF/UN0315717/Sokol

Good nutrition can break the vicious intergenerational cycles through which malnutrition perpetuates poverty, and poverty perpetuates malnutrition

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About this report

This edition of *The State of the World’s Children* report examines children, food and nutrition. It seeks to deepen understanding around the causes and consequences of children’s malnutrition in all its forms and to highlight how governments, business, families and other stakeholders can best respond.

Chapter 1 examines the changing face of children’s malnutrition. It sets out the current state of undernutrition, hidden hunger and overweight worldwide, explores the lives of children affected by severe acute malnutrition, and investigates the cost to children and to us all of malnutrition. It also introduces in greater detail some of the main ideas around food systems.

Chapter 2 investigates malnutrition across the life of the child, from development in the womb to the point where a young person is entering adulthood. It explores the developmental impacts of malnutrition and the unique nutritional needs and influences at each stage of childhood.

Chapter 3 explores malnutrition in a changing world. Globalization and urbanization are changing children’s diets while disasters and conflict worsen nutritional prospects for millions of poor and excluded children. Without transformation of today’s food systems, healthy diets will remain out of reach for the most vulnerable children, perpetuating intergenerational cycles of disadvantage.

Chapter 4 examines the current state of responses to children’s malnutrition, including the increased attention – at the global and national level – to the importance of addressing malnutrition across multiple systems, with particular emphasis on the food system in synergy with the health, water and sanitation, education and social protection systems, and on how different stakeholders are responding.

Finally, **Chapter 5** sets out an agenda to put children’s nutrition rights first (*see opposite page*). This agenda is driven by two imperatives. First, children have unique nutritional needs and can suffer unique harm from malnutrition. Putting children’s needs first is key to ensuring that every child and young person has the nutrition they need to get the best start in life. Second, all children and young people will need nutritious, safe, affordable and sustainable diets if societies are to meet the economic, social and environmental challenges of our changing world in the 21st century.

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Put children's nutrition first

1. Empower families, children and young people to demand nutritious food

Demand affects supply as food producers respond to consumers' behaviours and aspirations. When healthy options are affordable, convenient and desirable, parents and caregivers make better food choices for children. As children grow older, knowledge and information can make them powerful agents of change. Stimulating demand for nutritious foods means not only educating consumers on the benefits of healthy diets, but also leveraging cultural and social aspirations.



2. Drive food suppliers to do the right thing for children

Demand alone is not enough: healthy food must be available, affordable, safe and convenient. Food producers and suppliers have a key role to play, and so do governments, which must create a level playing field for all producers and suppliers and help ensure that their actions align with children's best interests. Food systems are diverse, and so are the solutions, but all food production and consumption must become sustainable if we are to protect children's nutrition today and tomorrow.



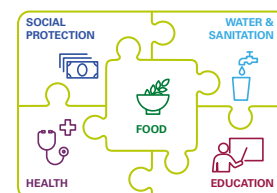
3. Build healthy food environments for all children

The personal and external food environments are where children and their caregivers interact with the food system. While the forces of supply and demand shape food environments, context-appropriate actions such as mandatory front-of-pack labelling and protection against exploitative marketing practices can help create food environments that are conducive to nutritious diets for children.



4. Mobilize supportive systems to scale up nutrition results for every child

As well as food systems, four other key systems must be mobilized to deliver nutrition services, improve nutrition practices and achieve nutrition outcomes at scale. The health, water and sanitation, education and social protection systems must all deliver interventions in a coordinated fashion. A systems approach to children's nutrition can help ensure that children and families have access to healthy diets and that children receive the nutrition services they need to develop to their full potential.



5 | Collect, analyse and use good-quality data and evidence regularly to guide action and track progress

Lack of adequate data prevents governments from responding with effective policies, strategies and programmes. Accurate and timely data are needed to understand malnutrition, take coordinated, evidence-based action, and to hold all actors to account. Data collection methods and frequency must be transformed to expand what we know about the diets and nutrition of children, adolescents and women at every stage of life. Data systems must become responsive and a culture of data-sharing and transparency must be developed.



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What do young people think about food and nutrition?

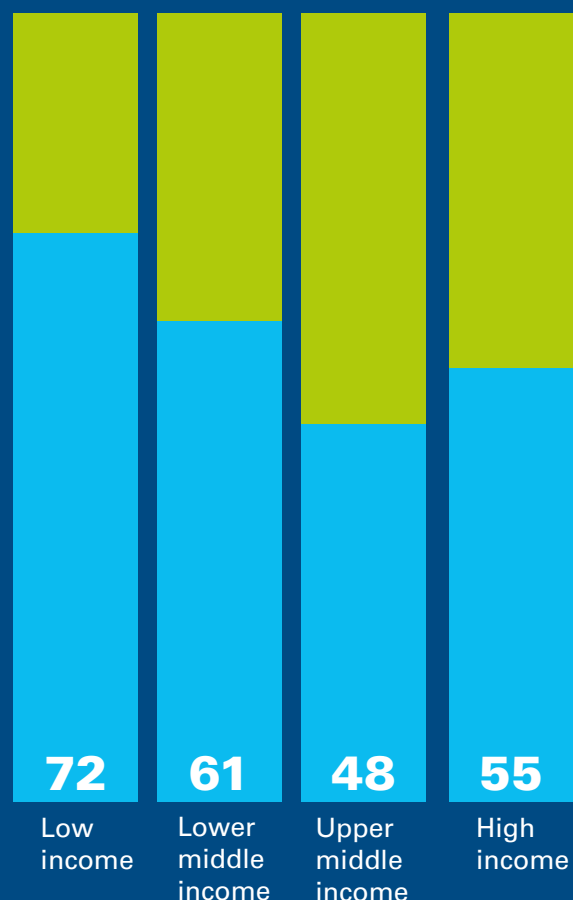
More than **150,000 adolescents** and young people in over **35 countries** told UNICEF's U-Report about their attitudes towards food, nutrition and body image.

U-Report is an innovative social messaging tool used by more than 7 million young people around the world to share their views on a range of common concerns.

*All numbers refer to the percentage of respondents.
(Numbers may not add up to 100% due to rounding)*

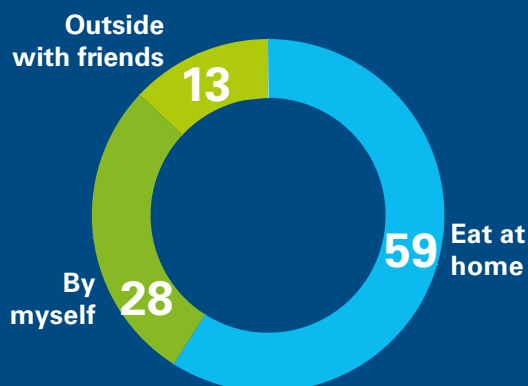
Do you eat healthily?

Most U-Reporters, especially in low-income countries, say they eat healthily

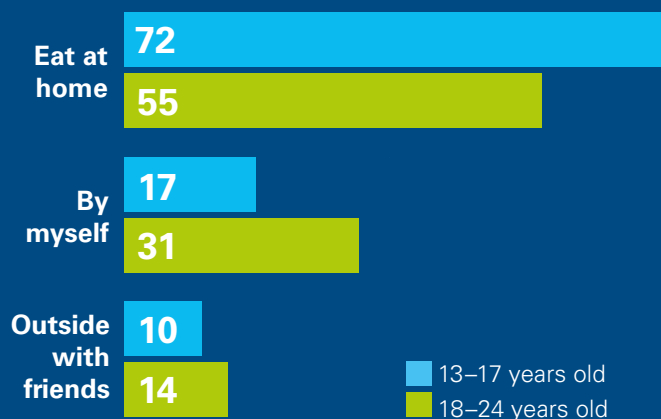


Where do you mostly eat?

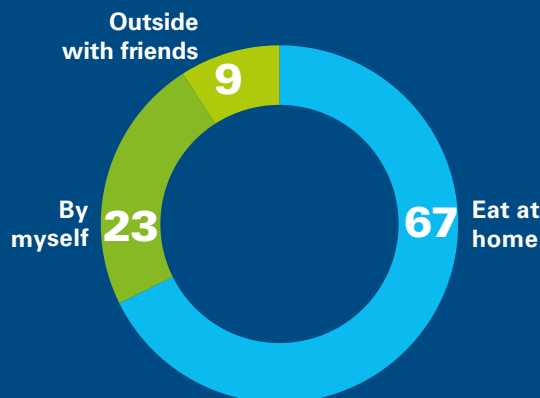
U-Reporters mostly eat at home with family



Older U-Reporters are more likely to eat alone



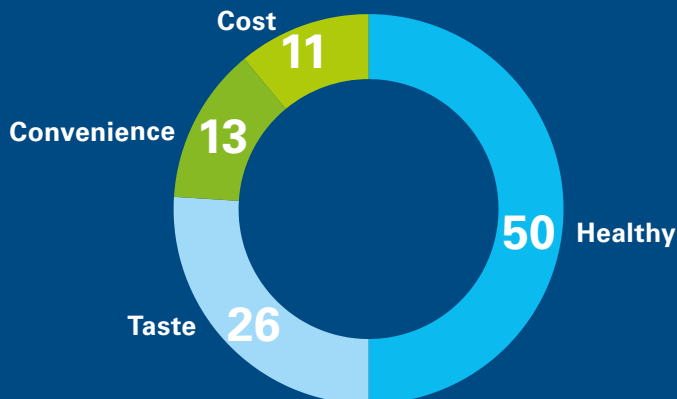
Eating with the family means eating healthier



Of U-Reporters who say they eat healthily more than 2 out of 3 say they mostly eat at home with their families

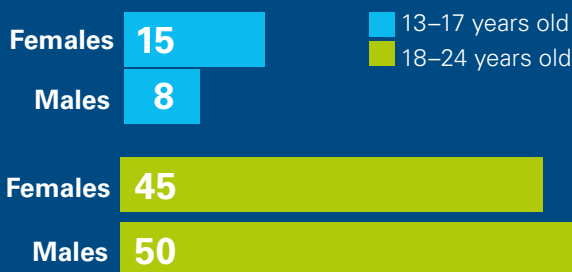
What is the most important factor when deciding what to eat?

Healthiness is the main concern in low- and lower-middle-income countries



But taste comes first in upper-middle and high-income countries

Bodyweight is also a concern in food choices



Older U-Reporters are more likely to say weight is a relevant factor in food choices

In high-income countries, weight is a concern for around 3 out of 5 females but only for around 1 in 2 males.

What's stopping you from eating healthier?

"Healthier food is often expensive, so my family can't afford it."

Female, 16, Eswatini

"Because my father has no means and I am a student of the 11th grade sciences."

Male, 17 Mali

"Nutritious food is quite costly and scarce."

Female, 23, India

"Can't buy healthy food because I can't afford it. We'll eat vegetables and fruits sometimes but it's just so expensive to buy it every day."

Female, 21, Philippines

"Not enough time to cook, lack of really fresh and useful products on store shelves."

Female, 19, Ukraine

"Unhealthy foods are unfortunately tasty."

Male, 16, Brazil

"Because of the appearance and taste of [healthy] food. It does not look colorful and is tasteless."

Male, 18, Thailand

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What do young people think about healthy eating?

More than 450 young people in 18 countries took part in **The State of the World's Children 2019 workshops** to talk about what they eat and why. The workshops were held along with similar events for mothers (see page 29). For a note on the workshop methodology, see page 178. Here we present an initial analysis of what participants in 12 countries said about the obstacles to eating healthily and how they try to improve their diets. A full analysis will be published in 2020. Responses have been translated and edited for clarity where necessary.

Do young people know which foods are healthy?

Overall, the adolescents who participated in the workshops reported making more healthy than unhealthy food choices.¹¹⁵ After describing what they ate over a 24-hour period, they were asked to rate whether the items were healthy or unhealthy. Their assessments were accurate for around half of the items, but inaccurate for about a fifth. For just under a third of the items, they were unable to say whether the choice was healthy or unhealthy. Overall, adolescents appear to have a limited understanding of the nutritional qualities of over half the foods they commonly encounter.

What prevents young people from eating healthily?

Adolescents said they faced significant barriers to healthy eating. Cost and taste were top of the list:

"We lack money here to stay healthy ... Our family is unable to find good jobs." *Girl, 16, India*

"Some of the food is hard to afford." *Boy, 16, Zimbabwe*

Many perceived healthy foods to be more expensive:

"Cheap food is not healthy, and healthy food is not cheap." *Girl, 13, China*

Taste was another barrier:

"I really like junk food." *Girl, 14, Guatemala*

"Healthy food is mainly not delicious." *Girl, 14, Kyrgyzstan*

Taste was a particularly relevant factor for urban participants. Some suggested that their food preferences had been affected by the ready availability of junk food:

"We are not able to eat healthy food because we have already tasted junk food and are now attracted to that only." *Boy, 14, India*

Many adolescents reported that nutritious foods were not sold near their homes:

"Meat is not available. We have money to buy meat, but the place is too far away." *Girl, 14, Ghana*

"Unhealthy food is easier to come by." *Boy, 17, USA*

Access and affordability were acute issues for some. In the Sudan, adolescents in a refugee camp were nearly three times more likely than rural participants to identify cost as a barrier to healthy eating. Lack of access to healthy food was also a key barrier.

The workshop participants pointed to the role of parents and caregivers in determining what they eat. They also highlighted time constraints for both themselves and their parents:

"My choice of food is not prepared for me. My parents decide what we will eat." *Girl, 15, Ghana*

"Sometimes, there is no time to cook so I eat fast food." *Girl, 15, Guatemala*

"Mothers do not have time." *Boy, 14, Mexico*

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How do adolescents try to improve their own diets?

Young people from all the countries surveyed reported taking personal action to eat better. Many said they valued eating well and set themselves personal goals:

"I remind myself to prioritize my health for at least one meal a day." *Girl, 18, USA*

"I try to make a better plan of what I'm going to do during the day to avoid those types of [unhealthy] food." *Girl, 15, Serbia*

Adolescents generally understood that some foodstuffs are not healthy, and took active steps to eat less unhealthy food:

"I avoid the things that will affect me too much ... junk food and street food." *Philippines, age and gender not indicated*

"I arrange time properly to have enough time to eat and start cooking for myself." *Girl, 13, China*

Sometimes they avoid unhealthy food by distracting themselves:

"If I get tempted to binge, I'll go for a walk, take a nap, or call a friend or talk to my mom. I think about how I'm going to feel later." *Girl, 17, USA*

Some said they ate foods they regarded as healthy even if they were not very tasty:

"I can tolerate the bad taste for the sake of my health." *Girl, 17, Egypt*

In lower-middle-income countries, gaining work was an important response to the high cost of food:

"Since there is no money to buy food, I have to ... work ... in order to get the money to buy it." *Boy, 14, Ghana*

"If I work ... to have money, then I will buy food for my family." *Boy, 13, the Sudan*

Saving money and eating home-grown and home-cooked food were other solutions:

"Sometimes I save some money during the week so that I can buy healthy food." *Girl, 16, Serbia*

"I ... plant fruits and vegetables." *Boy, 15, Guatemala*

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Summary

Large numbers of adolescents value healthy eating and go to some lengths to improve their own diets. However, many face significant obstacles, notably cost and access to healthy food.

What ideas do young people have to improve nutrition?

Workshop participants highlighted the need for increased knowledge and awareness about diet and nutrition:

"Educate people. Urge people to eat healthy meals. Hold meetings at the village library." *Group response, Egypt*

"Become informed through newspapers and the internet and purchase food accordingly." *Boy, 13, China*

They said governments, institutions and community leaders had a big role to play ...

"We need community leaders to talk to parents." *Group response, Ghana*

"Prevent [the] selling of unsafe food." *Group response, Serbia*

... as do young people:

"Form cooperative youth groups that deal with food issues and health." *Group response, Zimbabwe*

"We can spread ... the awareness necessary to solve problems. And write banners. We can create WhatsApp groups dedicated to solving problems." *Group response, Egypt*

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What feeding challenges do mothers face?

More than 320 women in 18 countries took part in **The State of the World's Children 2019 workshops** to talk about how they feed their babies and themselves. The workshops, organized with UNICEF country offices and national committees and Western Sydney University (WSU), were held along with similar events for young people (see page 26). For a note on the workshop methodology, see page 178. Here we present an initial analysis of what participants in 12 countries said about their infant feeding practices and the barriers they face in feeding their children and themselves well. A full analysis will be published in 2020. Responses have been translated and edited for clarity where necessary.

What are mothers' infant-feeding practices?

The World Health Organization recommends that babies be exclusively breastfed for their first 6 months of life, and then introduced to first (or complementary) foods, which gradually replace breastmilk between the ages of 6 and 23 months. Results from the workshop suggest that feeding practices in many instances are not optimal.

Almost all of the women breastfed either from birth or within the first 10 days after birth.¹¹⁶ However, around two out of five mothers introduced breastmilk substitutes (BMS) by the time their baby was 8 weeks old, and most were combining breastmilk and BMS (and, often, other liquids) before their baby reached 6 months of age.

Most mothers introduced first foods at 6 months of age, but a fifth started before their baby was 5 months old. Some waited until the baby was between 7 and 9 months.

What barriers do mothers face in feeding their babies well?

Overwhelmingly, the main barrier to feeding babies healthily was financial:

"I cannot even afford to give my baby unhealthy foods as I do not have the money." Age 20, Zimbabwe

"Money. I am not able to buy food to feed the child." Age 25, India

"There is no money at home." Age 24, Ghana

Mothers often echoed the perception of a 38-year-old workshop participant in the United States, who said, "Healthy food is expensive."

"In Australia, many things are expensive, like fish ... vegetables and meat. It should be cheap so that anyone can buy it." Age 29, Australia

"Sometimes, some foods are expensive." Age 22, Mexico

Access and availability are also obstacles:

"Sometimes healthy food is not available in the house." Age 28, Egypt

"It is difficult to get a vehicle to go ... to buy food." Age 30, Ghana

"It is hard to get fruits and vegetables, melon, watermelon, cucumber, carrot." Age 22, Guatemala

Mothers reported feeding challenges when babies disliked certain foods, or were 'fussy' or sickly.

"My baby doesn't like healthy food." Age 24, Egypt

"Children do not want to eat healthy food – they pester us, they start crying." Age 25, India

"[I find it difficult to find] food that my child wants; my child does not accept a particular type of food." Age 29, Sudan

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"My child does not like to suck my nipple."
Age 29, China

"When baby is not feeling well, when the baby is teething, it makes it difficult to feed."
Age 20, Ghana

Mothers also reported having to cope with unwanted family advice:

"My mother-in-law wants to feed my 8-month-old congee [a type of rice porridge] every day because these are easy-to-digest foods. I want the child to have all kinds of food." Age 27, China

"My husband's grandmother tells me what to feed him [my baby]." Age not specified, Mexico

What barriers do mothers face in feeding themselves well?

Mothers identified a range of creative workarounds to the barriers they face in feeding babies and themselves, including earning extra income and growing food themselves:

"Lack of money ... if I had money, I would purchase and prepare food as a mother [should]."
Age 25, Guatemala

"Sometimes I am short of money to buy some healthy foods." Age 25, Kyrgyzstan

"I eat healthy food when it is available. When it's not, I eat whatever is available." Age 20, Zimbabwe

"It is easier to acquire other foods [as opposed to healthy foods]." Age 19, Mexico

"It's a long distance from market to house."
Age 26, the Sudan

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What are mothers' solutions to the barriers they face?

Mothers identified a range of creative workarounds to the barriers they face in feeding babies and themselves, including earning extra income and growing food themselves:

"We can farm maize and sell it to get money; grow vegetables and sell to get money; sell cell phones for money; sell clothes for money." *Age 20, Zimbabwe*

"We can grow the food." *Age 26, Zimbabwe*

To overcome children's food preferences and 'fussiness', they described a range of creative solutions:

"I let her watch cartoons, rattle with toys, try to amuse her during the feeding." *Age 34, Serbia*

"I put mashed vegetables in the porridge and feed when the child talks." *Age 35, China*

"I blend the fruit and put it in the cake... I mix it with some food that she likes." *Age 25, Serbia*

To cope with unwanted advice from members of the family, women mostly said they tried to just ignore it, although this was not always possible:

"My mother told me to give my one-week-old baby some porridge, but I ignored her." *Age not specified, Australia*

"My mother-in-law constantly said I did not have enough milk, and in the end I stopped breastfeeding." *Age not specified, Australia*

Summary

Cost is by far the biggest obstacle to feeding and eating healthily for mothers, followed by a lack of availability and access to healthy foods. Many mothers described a range of other challenges, including babies' dislike of certain foods, 'fussy' eaters and family pressure.

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PERSPECTIVE

Upholding a child’s right to food and nutrition

Hilal Elver
United Nations
Special Rapporteur
on the
Right to Food

It should concern us all that so many children around the world suffer from malnutrition in all its forms. This situation demands a determined and effective policy response – a response that can only come about if there is political will to protect and respect children’s human rights, notably the right to adequate food, which guarantees freedom from hunger, and includes nutrition as a critical element. Safeguarding this right requires states to ensure that everyone – including children – has access to food that, at the very least, meets their basic nutritional needs and is culturally appropriate and safe.

States also need to respond to the structural and root causes of hunger and malnutrition from a human rights perspective. This should be guided by the principle that children’s economic, social and cultural rights are indivisible, a principle that underpins the Convention on the Rights of the Child (CRC), which marks its 30th anniversary this year. Nowhere is this indivisibility more relevant than in nutrition: the rights to clean water, health and an adequate standard of living, for example, are preconditions for the full realization of the right to food.

Similarly, the CRC extends additional protections to children to ensure their right to enjoy the highest attainable standard of health. For example, it calls on states to take measures to combat disease and malnutrition by, among other actions,

providing adequate nutritious foods, as well as nutrition information and education. Children also have rights to social protection, to an adequate standard of living, and to non-discrimination. This last principle is especially important for protecting adolescent girls from gender discrimination and violence, and for preventing discrimination against children of indigenous and rural communities.

Even short-term hunger can harm a child’s development. The CRC recognizes this unique vulnerability across the life course: it refers to the need to support those responsible for children’s care and to provide appropriate ante- and post-natal healthcare for mothers. This is supplemented by the Convention on the Elimination of All Forms of Discrimination Against Women, which promulgates rights for women during pregnancy and lactation. Unfortunately, that Convention falls short of protecting women’s individual right to adequate food and nutrition beyond their capacity as mothers. Granting women the autonomy to make everyday choices and the freedom to enjoy fundamental rights has been proven to improve reproductive health, family nutrition and child welfare.

Over the years, the Committee on the Rights of the Child has issued several General Comments to help states implement policies. General Comment No. 15, for example, emphasizes social protection,

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school-feeding programmes and preventive measures to avoid all forms of malnutrition. It also calls upon states to limit children's exposure to harmful food advertisements, and calls upon private companies to comply with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.

In considering the importance of breastfeeding, General Comment No. 7 advocates its promotion and protection, endorsing the World Health Organization's recommendations on exclusive breastfeeding. Nevertheless, many working mothers still face considerable obstacles in fulfilling this, in part because governments often fail to provide adequate maternity leave to protect both mothers and children.

Other General Comments cover the impact of private sector activities on the natural resources required to produce adequate food (No. 16), and the particular risks of malnutrition among children who are living with HIV/AIDS (No. 3). Also worth noting is General Comment No. 11, which, along with the Declaration on the Rights of Indigenous Peoples, focuses on indigenous children, for whom the

cultural significance of traditional land and the quality of the natural environment are intrinsically linked to the right to life and survival. A human-rights-based approach to child nutrition requires a clear understanding of the link between environmental degradation, access to natural resources and the rights of children to food and nutrition.

Integrating these human rights instruments and soft law documents, such as the Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security, into policymaking will ensure that rural children, children of migrants, refugees, and internally displaced peoples, as well as children affected by conflict and climate change, are not forgotten, and will help states to guarantee the right to food and nutrition in even the most marginalized communities. Applying a human-rights-based approach to the child's right to food and nutrition in a holistic manner requires good governance and political will at national and international levels. Once this political will is garnered, improving participation, accountability, monitoring and transparency are the first steps to implementing human rights principles effectively. ■

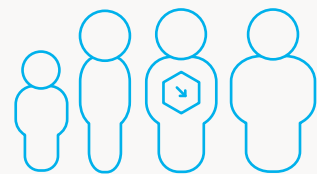
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01 CHILD MALNUTRITION TODAY

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Globally, almost 200 million children under 5 suffer from stunting, wasting, or both and at least 340 million from the hidden hunger of vitamin and mineral deficiencies. At the same time, 50 million children under 5 are overweight and the toll from overweight and obesity keeps rising, even in lower-income countries. These patterns reflect a profound triple burden of malnutrition that threatens the survival, growth and development of children and of nations.



- Far too many children continue to be affected by undernutrition and hidden hunger, while the numbers who are overweight are rising rapidly.
- Malnutrition is both a result, and a significant cause, of poverty and deprivation.
- Food systems offer a range of significant entry points to improve children's nutrition.
- Investment in nutrition brings high returns and is key to meeting the SDGs.

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All three strands
of malnutrition
– undernutrition,
hidden hunger and
overweight – are
interwoven

Introduction

In the 21st century, children’s malnutrition has three key strands. The first is the continuing scourge of undernutrition. Despite declines in some parts of the world, undernutrition deprives far too many children of the energy and nutrients they need to grow well and is linked to just under half of all deaths of children aged under 5 each year.¹ The second strand is hidden hunger – deficiencies in essential vitamins and minerals such as vitamins A and B, and iron and zinc. Unseen, and all too often ignored, hidden hunger robs children of their health and vitality and even their lives. The third strand is overweight and, in its more severe form, obesity. Once regarded as a condition of the rich, overweight now afflicts more and more children, even in some of the world’s least-developed countries. It is also fuelling a rise in diet-related non-communicable diseases (NCDs) later in life, such as heart disease, which is the leading cause of death worldwide.²

All three strands of malnutrition – undernutrition, hidden hunger and overweight – are interwoven. They can affect children, families and communities simultaneously and over the course of a single lifetime. The consequences are profound, not just for the child’s own prospects – in childhood itself and on into adulthood – but also for national economic development and the attainment of the Sustainable Development Goals (SDGs).

These forms of malnutrition also share many common causes. These begin with the diets of children and mothers, and stretch out to the ways in which access, affordability and decision-making power are distributed across our societies. Increasingly, we cannot think about the roots of these three strands

of malnutrition without talking about food systems – everything that happens to bring food ‘from farm to mouth’. Children’s malnutrition in the 21st century increasingly reflects the reality that too many food systems provide children with too little of the food they do need, and too much of the food they don’t need.

Child malnutrition today

Undernutrition – stunting and wasting

Undernutrition profoundly affects how children survive, grow and develop. Two of its most important forms are stunting and wasting.

Stunting

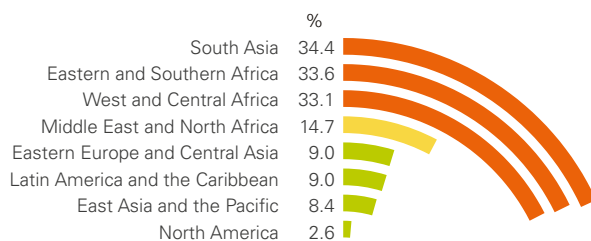
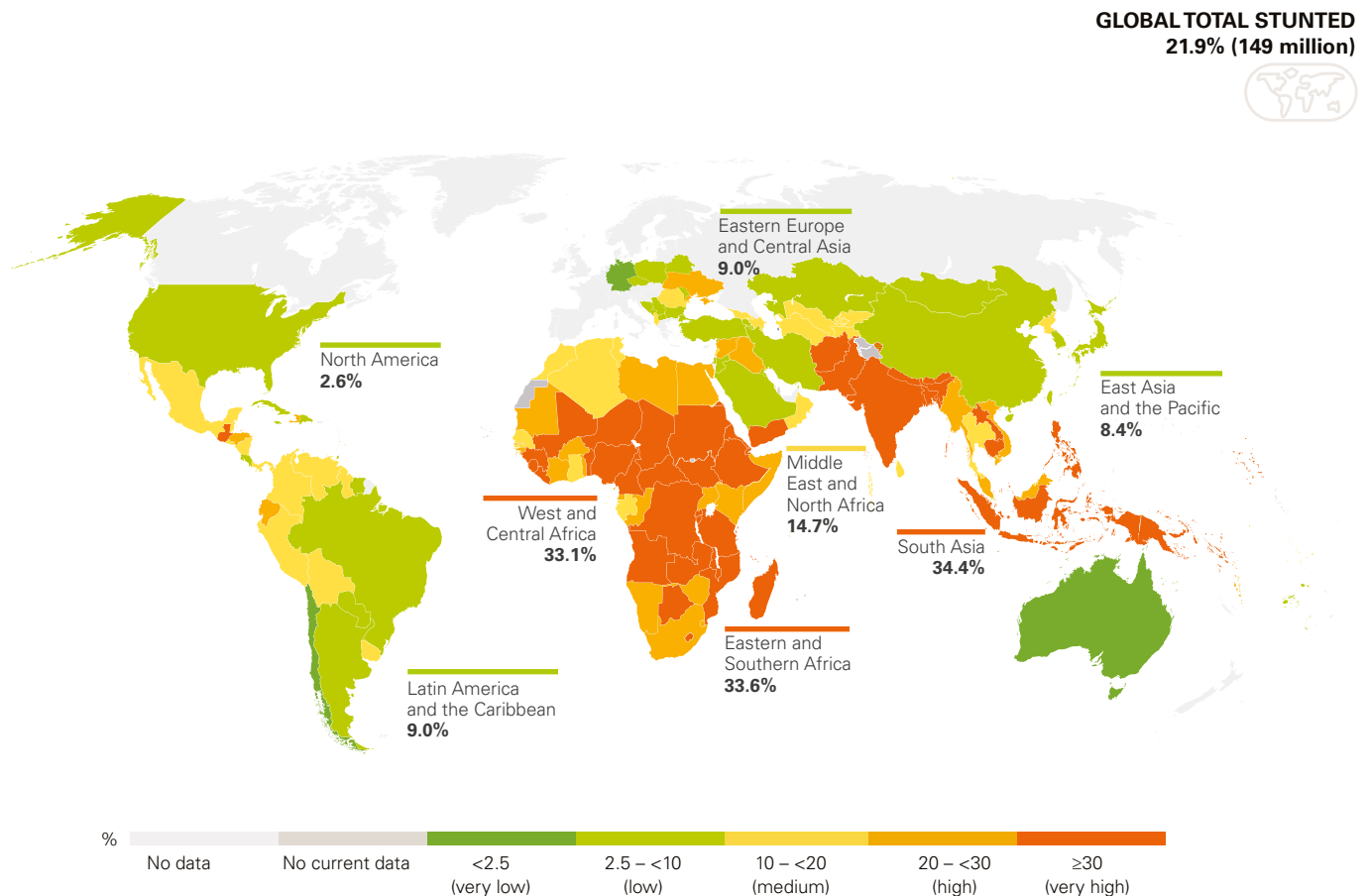
Stunting is used to describe populations of children who are too short for their age. But stunting is about far more than the height of an individual child – every community has shorter and taller children. Rather, it is a stark sign that children in a community are not developing well, physically and mentally, particularly in the first 1,000 days. Stunting has been described as not just the “best overall indicator” of children’s well-being, but also an “accurate reflection” of inequality in societies.³ As one report has noted, stunting “is both a symptom of past deprivation and a predictor of future poverty.”⁴

Sadly, in many communities, especially where short stature is common, the extent to which children are stunted is not fully recognized.⁵ Because of its lifelong consequences for children’s development, such failures are serious, not just for the well-being of individual children, but for broader economic and social development.

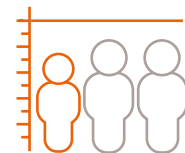
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Where do stunted children live?

FIGURE 1.1 | Percentage of stunted children under 5, 2018



In South Asia and sub-Saharan Africa, **1 in 3** children under five is stunted



Note: Country data are the most recent available estimate between 2000 and 2018; where only data prior to 2000 are available, the dark grey color denoting no recent data is used. The designations employed in this publication and the presentation of the material do not imply on the part of the United Nations Children's Fund (UNICEF) the expression of any opinion whatsoever concerning the legal status of any country or territory, or of its authorities or the delimitations of its frontiers.

Source: UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates, 2019 edition.

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Despite the encouraging declines in stunting, most parts of the world are currently not on course to meet targets for the SDG era

As with other forms of malnutrition, the causes of stunting start with the nutritional status of the mother. Mothers who suffered stunting in childhood are at greater risk of having stunted children. Women who are short of stature are also at greater risk of giving birth to pre-term children or children of low birthweight, who are, in turn, more likely to go on to be stunted. In 2015, an estimated 14.6 per cent of newborns had low birthweight, and about 9 out of 10 of these infants were in low- and middle-income countries.⁶ Stunting can thus be perpetuated across generations and, because of its close link to deprivation, can transmit poverty from one generation to the next.

This cycle can be broken. In just a single generation, women malnourished in childhood but who subsequently experience substantial improvements in their health, nutrition and living environment before conceiving can have children who are close to normal height.⁷ Evidence such as this underscores the importance of investing in maternal nutrition, not just to raise the life prospects of women, but also those of the next generation.

After a child is born, the nutritional status of the mother continues to be a factor through breastfeeding (see *Chapter 2*). Other factors also influence the child’s development, including the extent to which a child’s family has the resources to offer adequate food and care and its access to health services and clean water and sanitation. Repeated infections and gut inflammation can trap a child in a vicious cycle of disease and malnutrition: for example, a child with an inflamed gut finds it harder to absorb adequate nutrition, which weakens the child’s resistance to illness. It is estimated that a quarter of all cases of stunting in children aged 2

and under can be attributed to the child having experienced five or more cases of diarrhoea.⁸ Combating stunting thus requires investments in improving the quality of children’s diets and related nutrition practices and services.

Globally, the proportion and number of stunted children under 5 has been declining (see *Figure 1.2*). It fell by a quarter between 2000 and 2018 to 149 million children. In broad terms, this reflects rising incomes and improvements in governance in many countries.⁹ However, despite worldwide declines, progress in reducing stunting in much of Africa has been slow. Indeed, reflecting strong population growth, two UNICEF regions in the continent actually saw increases in the numbers of children affected between 2000 and 2018: the number of children under 5 with stunting rose by 1.4 million in Eastern and Southern Africa and by 6.5 million in West and Central Africa. The implications of this continuing burden of stunting for Africa’s human capital development are serious.

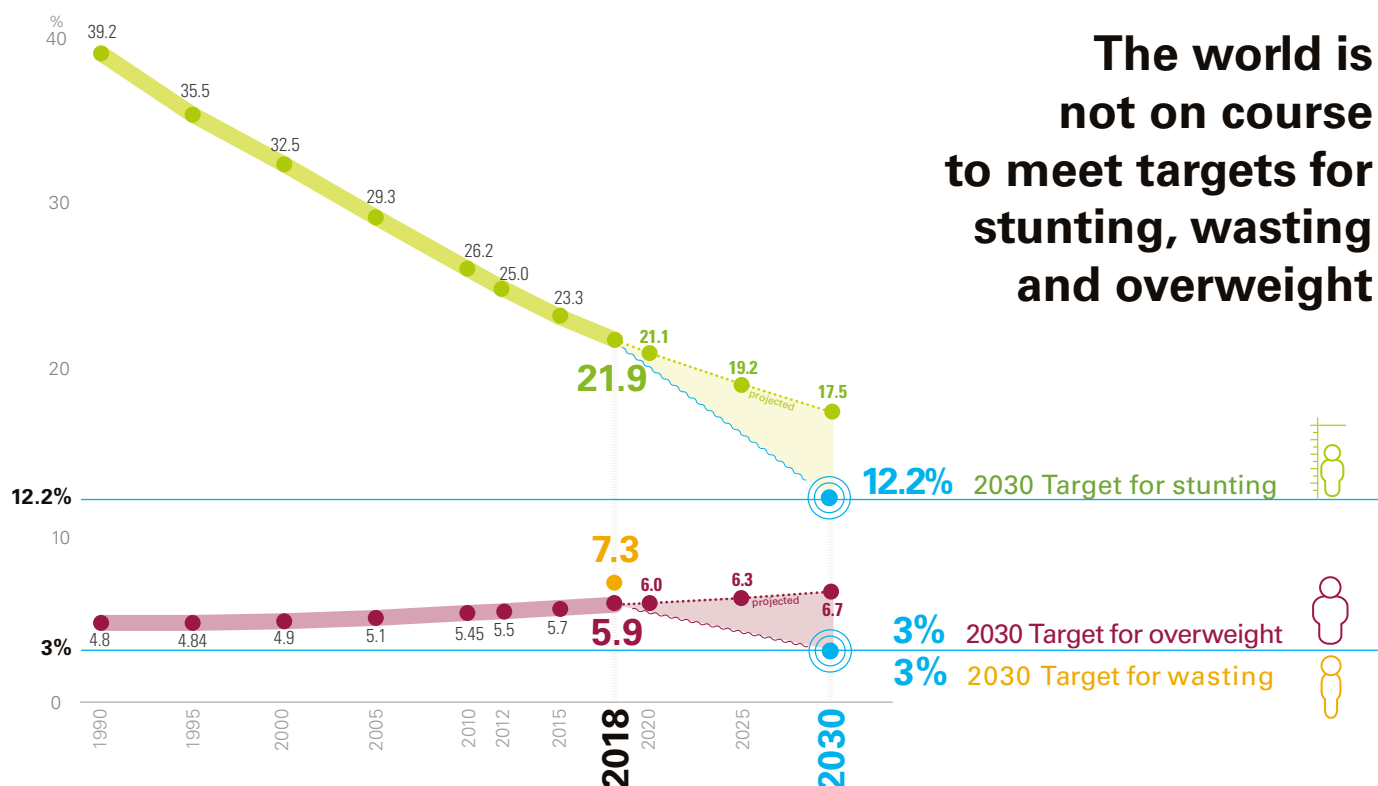
Despite the encouraging declines in stunting, most parts of the world are currently not on course to meet targets for the SDG era. Similarly, targets for wasting and overweight risk not being met without a sustained effort. The global reductions in stunting can also mask the reality that, in many countries, huge proportions of children still suffer from stunting – around 38 per cent of under-5s in India and Pakistan and 43 per cent in the Democratic Republic of the Congo.¹⁰ Even these national statistics paint only a partial picture. Within countries, there can be major differences between regions. In India, for example, almost half of children are stunted in the worst-affected state compared with a fifth in the least-affected state.¹¹

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FIGURE 1.2 | Projections for malnutrition in children under 5 compared to 2030 targets



Notes: WHA 2030 targets are a) 50% reduction in the number of children under-5 who are stunted, b) Reduce and maintain childhood overweight to less than 3% and c) Reduce and maintain childhood wasting to less than 3%. Wasting is an acute condition that can change frequently and rapidly over the course of a calendar year. This makes it difficult to generate reliable trends over time with the input data available and, therefore, this report provides only the most recent global and regional estimates. <https://data.unicef.org/resources/who-unicef-discussion-paper-nutrition-targets/>

Source: UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates, 2019 edition. Projections are based on analyses conducted by the UNICEF/World Health Organization/World Bank Income Group Joint Malnutrition Estimates Working Group.

Wasting

Globally, wasting threatens the lives of 7.3 per cent of the world's under-5s, or around 50 million children

Wasting describes a child who is too thin for his or her height. With important exceptions, it often reflects a *recent* loss of weight arising from severely poor nutrient intake, illness or both. Globally, wasting threatens the lives of 7.3 per cent of the world's under-5s, or around 50 million children. In 2013, wasting led to around 13 per cent

of worldwide deaths among under-5s representing 875,000 child deaths that could have been prevented.¹²

Trends in wasting can shift rapidly and frequently in response to factors like the seasonal availability of food and disease patterns for diarrhoea and malaria. Nevertheless, there is concern that the global declines seen in child stunting have not been seen in wasting.

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This seems to be particularly true in South Asia, a global epicentre for wasting, where 15.2 per cent of under-5s are affected, a proportion that international agencies class as ‘high’¹³ (other hotspots include sub-Saharan Africa, Southeast Asia and Oceania – see *Figure 1.3*), and where rates of wasting have shown little improvement.¹⁴ South Asia is also notable for when wasting occurs in a child’s life. Wasting in the region is most widespread in the first year of the child’s life, and less so in later childhood. In effect, many wasted children appear to be born wasted.¹⁵ This has important implications for solving the problem of wasting (as well as stunting) in the region: it clearly supports a strong prevention approach, particularly in supporting the nutrition of adolescent girls and mothers, and encouraging improved infant feeding and hygiene practices in the first two years of life (see *Chapter 3*).¹⁶

Wasting – the more widespread form of acute malnutrition – can be devastating for children, particularly in its most serious forms. Left untreated, children with severe acute malnutrition (SAM) are nearly 12 times more likely to die than a healthy child.¹⁷ SAM often results from a rapid deterioration in nutritional status, and is typically characterized by wasting, extreme thinness, or the swelling that is typical of nutritional oedema.^{18, 19} While the risk of death associated with SAM is highest for under-5s, school-age children and adolescents are also at risk. Children who appear to recover from SAM can still suffer cognitive impairments and other developmental problems, especially if they have stunted growth.²⁰

Global rates of severe wasting remain high: in 2018, around 16.6 million children under 5 were estimated to suffer from it.²¹ As with other forms of

Wasting can be devastating for children, particularly in its most severe forms

BOX 1.1 | Caring for wasted children at home

Recent years have brought significant breakthroughs in the treatment of SAM, notably with the rolling out of community management of acute malnutrition (CMAM) in many countries. Before CMAM, children with SAM were typically referred for lengthy and expensive in-patient hospital stays, a burden on many families that contributed to low rates of treatment. The CMAM approach instead empowers families to treat SAM at home, usually with ready-to-use therapeutic foods (RUTF) for children without medical complications, which comprise the majority of cases.

This approach has improved survival rates and has proved highly cost-effective, although more needs to be done to lower costs, for example through local production of RUTF).²⁷ While management of SAM is among the 10 highest impact nutritional interventions to reduce child mortality,²⁸ this impact can potentially be boosted still further: For example, health services that provide early detection of both SAM and HIV can be critical in improving survival rates among children by facilitating interventions at a critical point in disease progression and child development.■

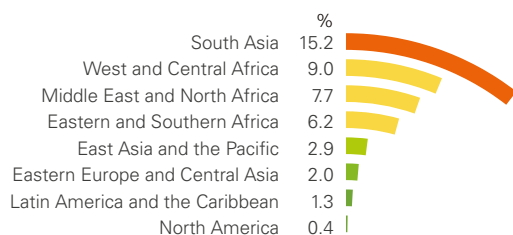
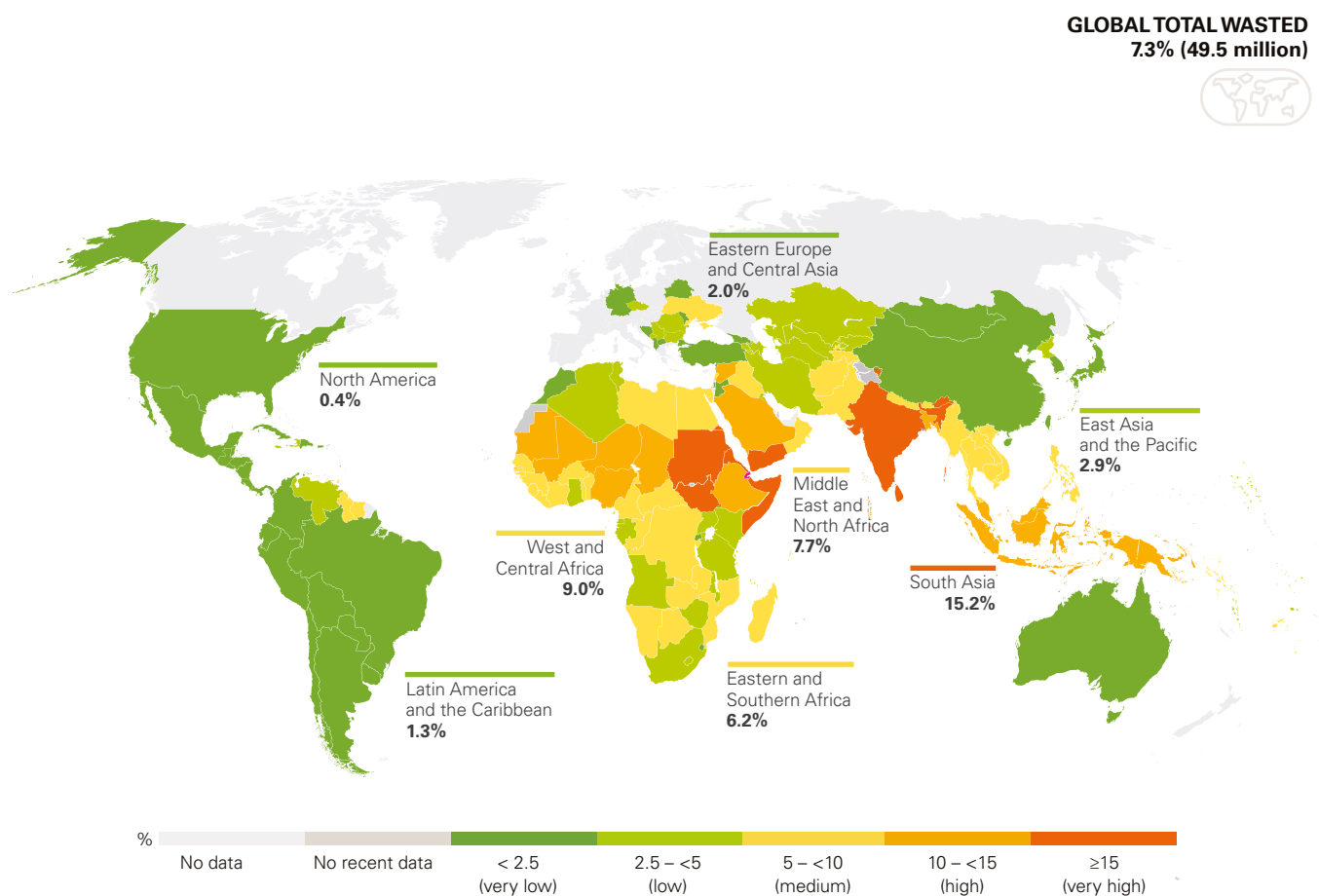


Born in the rural Philippine province of Palawan, Joemar comes from a deprived family in which both parents have suffered health problems. The family’s ethnic community has limited access to services and understanding of malnutrition. As a result, and despite showing clear symptoms, Joemar was not immediately diagnosed as suffering from severe acute malnutrition. Once treatment began, he made swift progress, doubling his weight in just a few months. Just like Joemar, more Filipino children are now getting a second chance: Supported by UNICEF, the Philippines is scaling up services and capacities to prevent and treat acute malnutrition and, by 2022, aims to put in place a nationwide programme of interventions, with a strategic focus on the first 1,000 days. © UNICEF/Philippines/2016

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Where do wasted children live?

FIGURE 1.3 | Percentage of wasted children under 5, 2018



In **South Asia** more than **1 in 7** children under 5 is wasted

Note: Country data are the most recent available estimate between 2000 and 2018; where only data prior to 2000 are available, the dark grey color denoting no recent data is used. The designations employed in this publication and the presentation of the material do not imply on the part of the United Nations Children's Fund (UNICEF) the expression of any opinion whatsoever concerning the legal status of any country or territory, or of its authorities or the delimitations of its frontiers.

Source: UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates, 2019 edition.

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malnutrition, poverty is often at the heart of SAM. Seasonal fluctuations matter, too: the rainy season is often the pre-harvest period when food stocks are low, roads are cut off, and the incidence of waterborne disease increases. Children who are ill are also at particular risk: those with HIV are three times as likely to die from SAM as their counterparts.^{22, 23, 24} HIV together with malnutrition among infants is particularly fatal.

Although children suffering SAM are often the face of humanitarian emergencies, most SAM cases actually occur in non-emergency settings. The mistaken assumption that SAM mainly occurs in emergencies – and is the responsibility of the humanitarian

community – has hampered effective prevention and treatment of SAM globally.

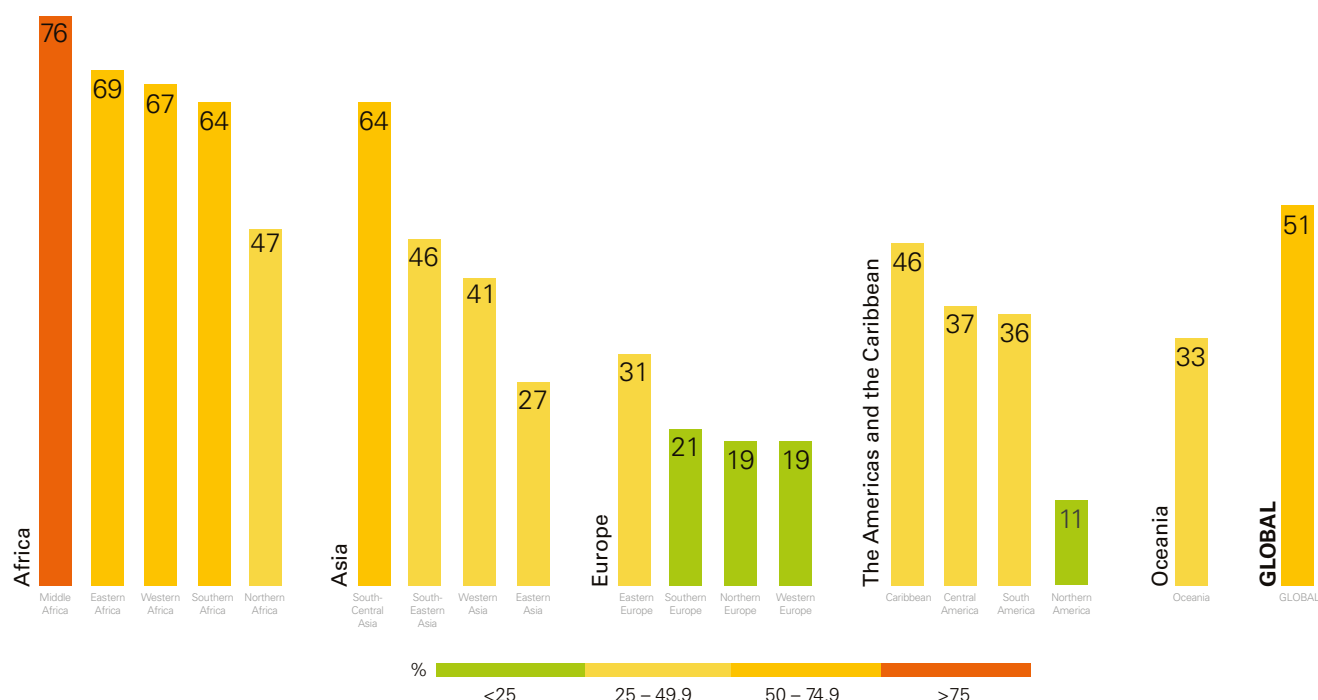
Overall, far too few children with SAM are being treated. Despite global progress in the number of children reached (from 1.1 million children in 2009 to 4.4 million in 2017), only about one in four children receives treatment.²⁵ Scaling up successful approaches requires supportive national policies, dedicated government resources and integration into routine national services. In countries where this has been achieved, efficiency and scale-up have been greatly increased.²⁶ Even so, although treatment saves lives, it does not address the underlying and basic causes that are key to ensuring the long-term prevention of wasting.

A girl receives Vitamin A drops at Mont Ngafula Health Centre in Kinshasha, Democratic Republic of Congo. Vitamin A deficiency is the leading cause of preventable childhood blindness and increases the risk of death from common childhood illnesses such as diarrhoea. Despite the increasing availability of fortified foods, about one in five children is deficient in vitamin A.⁴¹ © UNICEF/UNI44415/Pirozzi

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Where do children with hidden hunger live?

FIGURE 1.4 | Percentage of children under 5 with hidden hunger



Source: UNICEF estimates, 2019 based on Black et al, 2013 and Stevens et al, 2015. See Note on Figures on p. 179 for more information.

At least 340 million children under 5 (one in two) suffer from hidden hunger

Hidden hunger

Children and mothers who are deficient in micronutrients – the vitamins and minerals that are essential for survival, growth and development – can suffer devastating consequences. Some examples: vitamin A deficiency is the main cause of blindness in children.²⁹ Women with severe anaemia (often, although not exclusively, linked to a lack of iron in the diet) have double the risk of dying during or shortly after childbirth (see Figure 1.4).³⁰ Iodine deficiency, even in its mild forms, can harm a child's

ability to learn.³¹ UNICEF estimates that globally, at least one in two children under 5 – or 340 million – suffers from hidden hunger due to deficiencies in vitamins and other essential nutrients.³²

Often, however, the effects are invisible or may appear too late for anything to be done. That's why these deficiencies are often referred to as 'hidden hunger'. Hidden or not, the impact is very real. As UNICEF's Kul C. Gautam said in 2004, "You might not feel it in the belly, but it strikes at the core of your health and vitality."³³

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As with all forms of malnutrition, poor diets play a major role in hidden hunger. Indeed, dietary diversity is used as a measure of whether or not children and mothers are meeting their micronutrient needs.³⁴ These measures paint a worrying picture (*see Chapter 2*). But children and mothers also need to be physically able to absorb vitamins and minerals. Conditions such as diarrhoea and chronic gut inflammations can prevent that from happening, as can other factors, for example whether a micronutrient comes from an animal- or plant-source food.

More broadly, hidden hunger can exist with both traditional and modern diets. Some communities in low-income countries, for example, depend heavily on just a few staples, such as grains and tubers, and may only very occasionally eat more nutrient-rich items such as fruit, vegetables, meat, fish, eggs and dairy. Modern diets, too, are implicated. Processed and ultra-processed foods can be fortified with essential vitamins and minerals, and in many parts of the world this helps meet children's micronutrient needs (*see Chapter 4*). However, ultra-processed foods and drinks can also be deficient in essential vitamins and minerals.^{35, 36} And because some of these foods, such as cheap instant noodles and biscuits, can be very filling, they can reduce children's appetite for more nutrient-dense fruits and vegetables.³⁷

Precise and up-to-date estimates of the extent of hidden hunger are lacking, reflecting the challenge, cost and time-consuming nature of measuring it. Given the seriousness of hidden hunger's impact on children, there is an urgent need to improve understanding of the problem through the development of inexpensive and effective forms of testing. UNICEF's recent global estimate – of at least 340 million children under 5 – is a

conservative figure as it only reflects the estimated number of children who suffer from vitamin A and iron deficiencies.³⁸ In both high- and low-income countries, children are at greatest risk of hidden hunger and frequently suffer multiple deficiencies simultaneously, a reflection of their poor diet overall.^{39, 40}

Overweight and obesity

Overweight and obesity matter for children, both in childhood and in later life. In childhood, they can lead to a number of medical conditions, including gastrointestinal, musculoskeletal and orthopaedic complications, as well as the early onset of type 2 diabetes and behavioural and emotional problems, including depression and stigmatization. Childhood obesity is also a strong predictor of adult obesity, which can have serious health and economic consequences.⁴²

The number of overweight children has increased in every continent (*see Figure 1.5*). Based on recent trends, the number of overweight under-5s will rise from 40 million children to 43 million by 2025.⁴³

Overweight is sometimes seen as a problem only in wealthy countries, but it is striking just how much it now also affects low- and middle-income countries and how rapidly the problem is growing (*see Figure 1.6*). In 2018, almost half the world's overweight under-5s lived in Asia and a quarter in Africa; in Africa, the number of overweight under-5s rose by just under 44 per cent between 2000 and 2018.⁴⁴

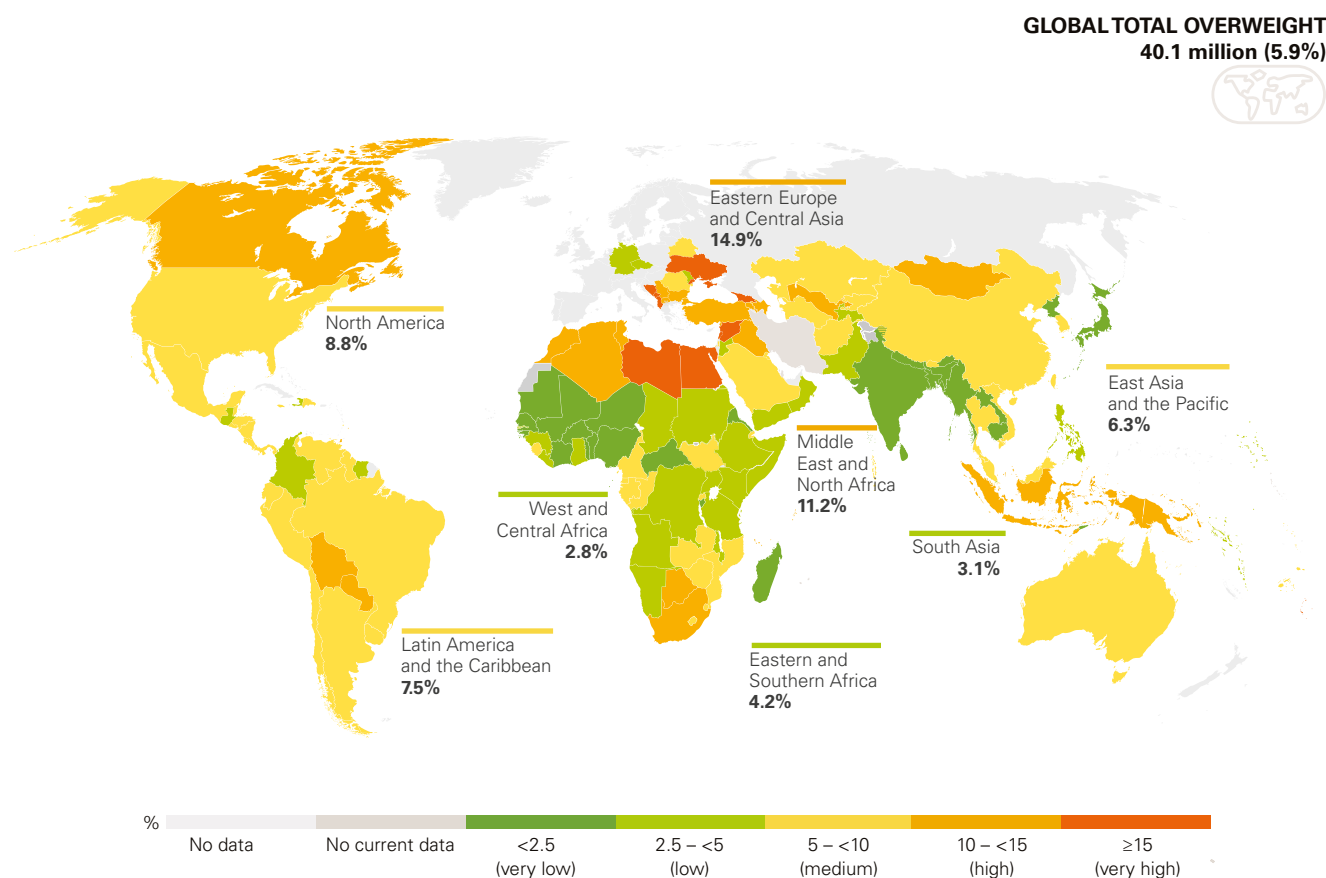
These data tell only part of the story, however. Estimates for older children help indicate the true scale of the overweight challenge. According to the NCD Risk Factor Collaboration, the

Overweight is sometimes seen as a problem only in wealthy countries, but it is striking just how much it now also affects low- and middle-income countries

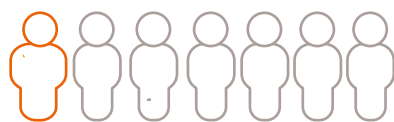
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Where do overweight children live?

FIGURE 1.5 | Percentage of overweight children under 5, 2018



| | |
|---------------------------------|-------|
| Eastern Europe and Central Asia | 14.9% |
| Middle East and North Africa | 11.2% |
| North America | 8.8% |
| Latin America and the Caribbean | 7.5% |
| East Asia and the Pacific | 6.3% |
| Eastern and Southern Africa | 4.2% |
| South Asia | 3.1% |
| West and Central Africa | 2.8% |



In **Eastern Europe and Central Asia**, almost **1 in 7** children under 5 is overweight

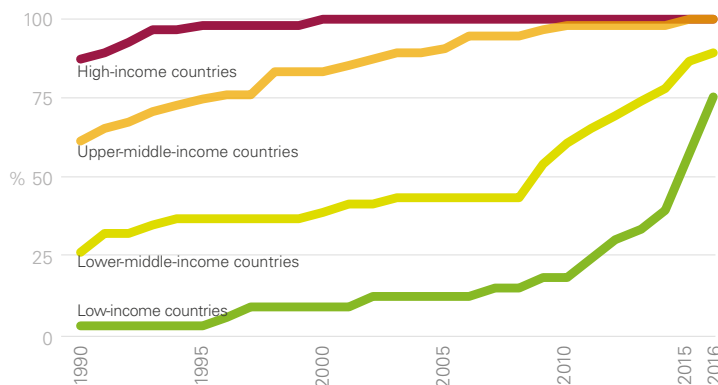
Note: Country data are the most recent available estimate between 2000 and 2018; where only data prior to 2000 are available, the dark grey color denoting no recent data is used. The designations employed in this publication and the presentation of the material do not imply on the part of the United Nations Children's Fund (UNICEF) the expression of any opinion whatsoever concerning the legal status of any country or territory, or of its authorities or the delimitations of its frontiers.

Source: UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates, 2019 edition.

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FIGURE 1.6 | **Trend in number of countries by World Bank income group where at least 10 per cent of children aged 5–19 years are overweight**

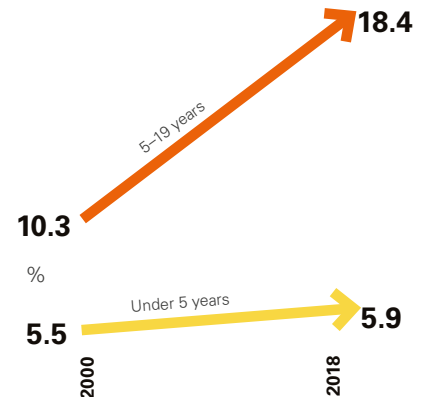
Low- and lower middle-income countries have seen a significant rise in overweight over the past decade.



Note: Income classifications are based on World Bank FY19 classifications.

Source: NCD Risk Factor Collaboration (NCD-RisC) (2017). 'Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: A pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults', *The Lancet*, 390(10113), pp. 2627–2642

FIGURE 1.7 | **Increase in overweight among under-5 and 5–19-year-old children and young people**



Source: UNICEF/World Health Organization/World Bank Group Joint Malnutrition Estimates and NCD Risk Factor Collaboration (2017).

proportion of overweight children aged between 5 and 19 rose from around 1 in 10 (10.3 per cent) in 2000 to a little under 1 in 5 (18.4 per cent) in 2016 (see *Figure 1.7*).

What's driving these increases? Research points to a few key factors. A rising intake of calories, a shift in what children are eating from traditional to modern diets, urbanization and falling levels of physical activity all play a part.⁴⁵ Some research also suggests that changes in the gut microbiome may be a factor.

Where are childhood trends going? There are signs that overweight has been levelling off in high-income

countries, albeit at very high levels – around a third of children aged 2 to 15 in the United Kingdom, for example.⁴⁶ However, this trend is not being seen in poorer communities, resulting in widening inequalities in rates of obesity between high- and low-income social groups. Children from poorer backgrounds also tend to have more severe forms of overweight.^{47, 48} In low- and middle-income countries, and especially in much of Asia, rates of overweight look likely to go on rising. Strikingly, there is little or no consistent evidence of countries achieving and sustaining a decline in obesity across the population since the 1980s,⁴⁹ underlining the need to focus on prevention.

Overweight is no longer a problem just for wealthier countries and is rising faster among older children

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SPECIAL SECTION

Overweight and obesity in OECD and EU countries

A century ago, overweight and obesity were linked to wealth. Not anymore. In wealthy countries, poor children are often the most likely to be overweight or obese.⁵⁰

Although rates of overweight in children have plateaued in many high-income countries, they have nevertheless settled at levels that put millions of children’s lives, health and futures at risk.⁵¹ Among 41 countries in the OECD and EU, not one has fewer than one in five children (aged 5–19 years) overweight, except for Japan (*see Figure 1.8*).

Overweight and disadvantage

The children who suffer overweight are usually from socio-economically disadvantaged families. In the United States, for example, overweight in children decreases as families’ education and income levels increase.⁵³ The link between obesity and socio-economic disadvantage has also been demonstrated in Europe.⁵⁴ A study using data from the 2008 WHO Childhood Obesity Surveillance Initiative in Europe linked parental socio-economic status and lack of education with obesity in children in Czechia, Portugal and Sweden.⁵⁵

The impact of overweight on lives and economies offers a cautionary tale as these health risks rapidly expand into low- and middle-income countries.⁵⁶ The effects are also economic. In Germany, the lifetime cost of overweight and obesity – due to factors including lost productivity and illness – is about 145 billion euros (about US\$162 billion).⁵⁸ In the United States, US\$190 billion a year is spent on treating obesity and obesity-related conditions – about a fifth of the country’s healthcare expenditures. In Brazil’s public hospitals, the estimated direct costs of diseases related to overweight and obesity were US\$2.1 billion annually.⁵⁸

Response

Despite growing awareness of the dangers of overweight, efforts to address the issue have not been systematic.⁵⁹ In recent years, however, countries including Belgium, Chile, Finland, France, Hungary and Mexico have begun to establish policies to address obesity, including taxes and easy-to-understand nutrition labels such as front-of-pack warning labels. These and other efforts are guided by WHO recommendations aimed at providing a holistic approach to addressing childhood obesity.^{60, 61, 62}

Globally, there is little information on government spending to address obesity and diet-related NCDs, such as diabetes, cardiovascular disease and some cancers.⁶³ In 2015, only about 0.01 per cent of global development assistance was spent on preventing and treating obesity- and diet-related NCDs.⁶⁴ As low- and middle-income countries begin to deal with the complex consequences of growing rates of overweight, the costs of prevention and treatment risk exceeding the capabilities of healthcare systems to respond. ■

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The children who suffer from overweight are usually from socio-economically disadvantaged families

FIGURE 1.8 | Percentage of children and adolescents 5–19 years who are overweight in 41 OECD and EU countries

| Country | Prevalence (%) 2016 | % increase since 1990 |
|-------------------|---------------------|-----------------------|
| United States | 41.86 | 49.7 |
| New Zealand | 39.46 | 44.6 |
| Greece | 37.26 | 48.9 |
| Malta | 37.11 | 20.1 |
| Italy | 36.87 | 39.1 |
| Chile | 35.54 | 61.1 |
| Mexico | 35.51 | 76.0 |
| Israel | 34.80 | 18.2 |
| Australia | 34.11 | 35.1 |
| Spain | 33.80 | 38.4 |
| Cyprus | 33.47 | 50.6 |
| Portugal | 32.57 | 86.2 |
| Canada | 32.15 | 45.1 |
| United Kingdom | 31.12 | 33.1 |
| Ireland | 30.86 | 84.4 |
| France | 30.09 | 38.7 |
| Turkey | 29.55 | 151.1 |
| Bulgaria | 28.47 | 120.6 |
| Hungary | 28.45 | 117.3 |
| Iceland | 28.33 | 15.3 |
| Croatia | 28.00 | 160.0 |
| Republic of Korea | 27.63 | 94.9 |
| Norway | 27.47 | 42.1 |
| Czechia | 27.19 | 81.2 |
| Slovenia | 27.18 | 168.8 |
| Finland | 26.81 | 35.7 |
| Austria | 26.68 | 48.8 |
| Germany | 26.58 | 37.0 |
| Luxembourg | 26.33 | 29.3 |
| Poland | 25.72 | 131.1 |
| Denmark | 25.11 | 13.6 |
| Netherlands | 24.77 | 61.9 |
| Romania | 24.56 | 171 |
| Belgium | 23.93 | -1.8 |
| Sweden | 23.62 | 24.6 |
| Slovakia | 23.36 | 157.0 |
| Switzerland | 21.87 | 39.4 |
| Latvia | 21.33 | 75.9 |
| Lithuania | 20.58 | 84.2 |
| Estonia | 20.46 | 68.0 |
| Japan | 14.42 | 14.3 |

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Undernutrition, hidden hunger and overweight share common causes, notably the poor quality of children's diets

Pulling the strands of malnutrition together

As noted earlier, the various strands of malnutrition – undernutrition, hidden hunger and overweight – are interwoven in many different ways. For example, two or three forms of malnutrition may strike children simultaneously or across the course of their lives. In addition, two, or increasingly all three, are simultaneously present in growing numbers of countries and communities – a **triple burden of malnutrition** (see Figure 1.9). Finally, all three share many common causes, notably the poor quality of children's diets.

of malnutrition is the coexistence of stunting and wasting. As one group of experts puts it, “a wasted child is more likely to become stunted and a stunted child is more likely to become wasted.”⁶⁵ Such children are likely to have experienced “an early environment characterized by harsh deprivation,” as one study notes.⁶⁶ This combination of stunting and wasting increases the risk of death, even compared with children who are severely wasted.⁶⁷ Given these links, there have been growing calls in recent years for nutrition programmes to address stunting and wasting simultaneously. Failure to do so risks undermining the effectiveness of programmes.⁶⁸

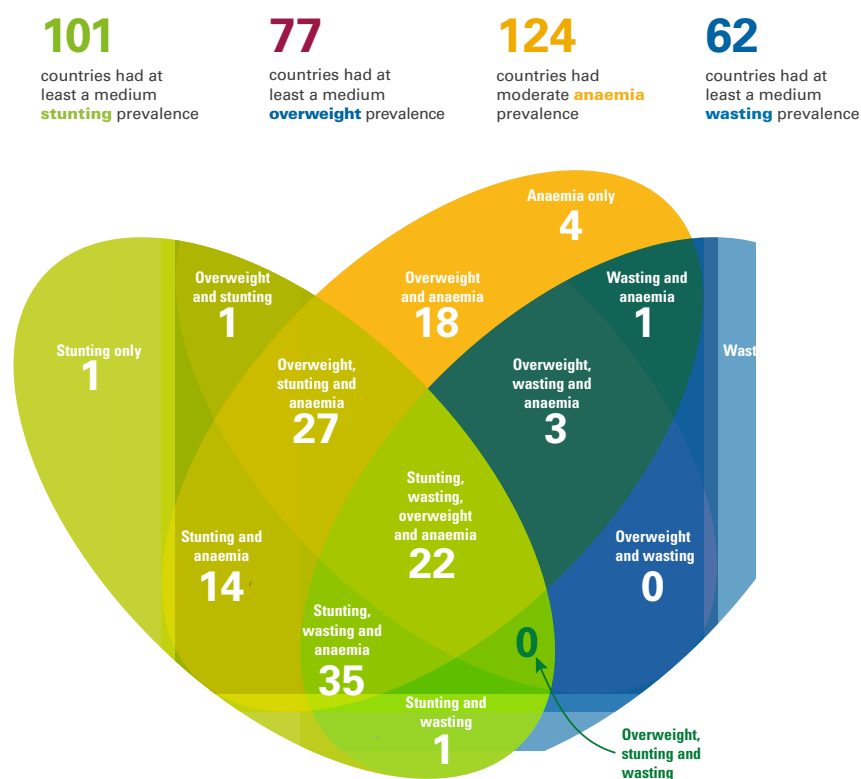
Coexistence in individuals

One of the most common ways in which a child can suffer multiple forms

Other forms of coexistence also exist. For example, 8.2 million children under 5 are estimated to suffer from both stunting and overweight globally while stunting,

FIGURE 1.9 | Number of countries with overlapping forms of childhood stunting, wasting, overweight and anaemia

How many countries face a triple burden of malnutrition?



Note: A medium stunting prevalence is defined as >10%; a medium overweight prevalence is defined as >5%; a medium wasting prevalence is defined as >5%; a moderate anaemia prevalence is defined as >20%. Analysis is based on 134 countries with recent estimates for at least three indicators.

Source: UNICEF, WHO, World Bank Group (2019). *Joint Child Malnutrition Estimates*. WHO, Geneva. Source for anaemia data: Global Health Observatory, World Health Organization (2019). *Anaemia in children <5 years – Estimates by country* [Data table]. Retrieved from <http://apps.who.int/gho/data/view.main.ANEMIACHILDRENREGV>.

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wasting and overweight often coexist with different forms of hidden hunger.⁶⁹ Individuals can also suffer from different forms of malnutrition across their lives: for example, stunting in early childhood may raise the risk of overweight in later life.⁷⁰

The triple burden of malnutrition

Many parts of the world are now facing the triple burden of malnutrition, which is evident in countries, communities and even individual families. One regularly cited example is where a family has an overweight mother and a stunted child. In India, analysis of 2011–2012 data suggests this may be the case in 5 per cent of rural and 8 per cent of urban households. For Egypt, the figure is 5.6 per cent of households, according to analysis of 2008 data. In both countries, the problem appears to be growing.⁷¹ In Egypt, researchers attribute part of the rise to families' increased consumption of sugary snacks, which fail to provide children with the nutrients they need for healthy growth and provide excess calories to the mother.⁷² These examples highlight the need to consider children's malnutrition in the wider family and household context.

More broadly, many low- and middle-income countries are now facing the challenge of coping with the continuing burden of stunting and wasting, various forms of hidden hunger and rising rates of overweight (see *Figure 1.9*). For many, these multiples challenges risk outpacing their capacity to respond.

Poverty, exclusion and malnutrition

Poverty is often at the heart of malnutrition. According to a 2016 UNICEF and World Bank Study, of the 385 million children living in extreme poverty around the

world in 2013, half lived in sub-Saharan Africa and just over a third in South Asia. More than four out of five of these children lived in rural areas. They are more likely to be underfed and malnourished, get sick, not complete school and fall back into poverty in the aftermath of drought, disease or economic instability. Poor children are also least likely to have access to safe water and adequate sanitation, to receive preventative healthcare such as vaccinations, and when ill are less likely to get adequate medical care. These problems are experienced even more intensely by children living through emergencies and other crises (see *Special section: Nutrition in emergencies*).

Poverty is about more than just financial resources. For many children and families, it is intertwined with social exclusion, discrimination and marginalization driven by gender, disability, ethnicity, geographic remoteness and displacement. At the individual level, such exclusion and inequity determine local access to goods and services, including healthy foods. At the societal level, they can mean that the voices and needs of poor and marginalized communities are not heard in broader decision-making.

The impact of **gender** is evident in every facet of malnutrition and its causes (see *Chapter 3, Special section: Girls and women need stronger support for better nutrition*). Research and programmatic experience show that women's empowerment is associated with better nutrition for children and women, yet in far too many places, women are still served last (and least) at mealtimes and have very limited autonomy, which can mean having limited or no control over their own and their family's income and being excluded from making decisions.

Poverty is often at the heart of malnutrition ... poor children are more likely to be underfed and malnourished, get sick, not complete school and fall back into poverty in the aftermath of drought, disease or economic instability

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Stigma around disability can result in newborns not being breastfed or children being given less nutritious or smaller portions of food

Disability can be both a cause and consequence of malnutrition. A lack of nutrients, vitamins and minerals, or exposure to high levels of toxins, for example, can lead to blindness or neurological damage. At the same time, some disabilities – such as intellectual and developmental disabilities or a cleft palate – can lead to a reduced nutrient intake or failure to meet increased nutritional needs. Stigma around disability can result in newborns not being breastfed or children being given less nutritious or smaller portions of food, or even not being fed at all.

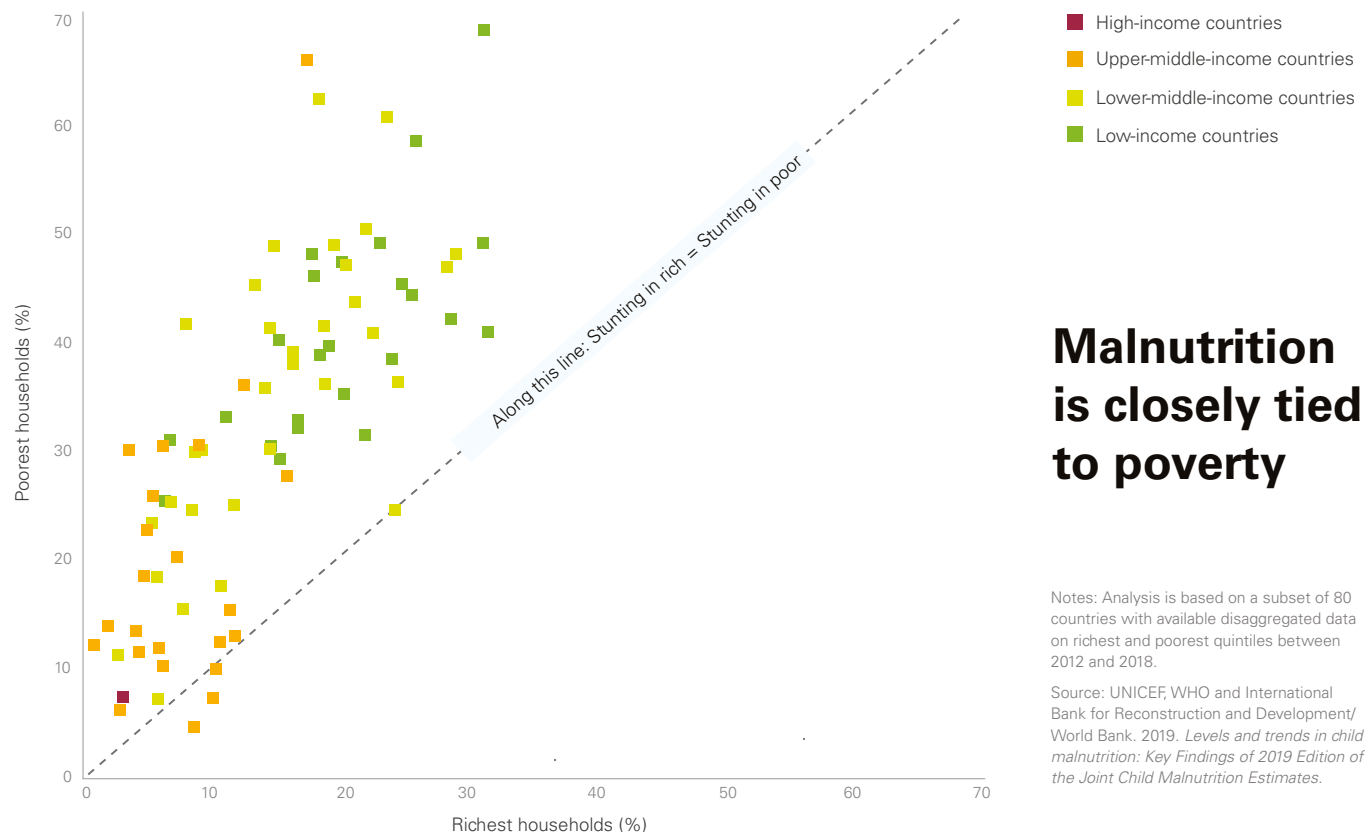
Indigenous people and other disadvantaged **ethnic groups** also

face greater risk of malnutrition.

In Brazil, for example, the rate of stunting among indigenous groups in 2013 was two to five times higher than among non-indigenous groups. Explanations for this difference include poorer nutrient intake, poorer sanitation and less access to primary healthcare services.⁷³

Geographical remoteness can also determine whether a family has access to essential foods and healthcare and nutrition services. Compared with their urban counterparts, children living in rural areas of Burundi, Honduras and Mali are twice as likely to be stunted, which rises to three times as likely in Peru.⁷⁴

FIGURE 1.10 | Percentage of stunted children in poorest vs. richest households in low-, lower-middle-, upper-middle- and high-income countries



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SPOTLIGHT

United Kingdom: Poorest children at greater risk of overweight and food insecurity

One in three children in England is overweight or obese by the time they leave primary school.¹¹⁴ Overweight and obesity prevalence is more than twice as high in the poorest areas, and the gap is widening as obesity continues to rise in the most deprived areas.¹¹⁵ The picture is similar for children elsewhere in the United Kingdom.¹¹⁶

Children's diets are heavily influenced by the environments in which they live. England's poorest areas are fast-food hotspots, with five times more outlets than in the most affluent areas.¹¹⁷ Children from poorer areas are disproportionately exposed to takeaways selling fried chicken, burgers and pizzas, and poorer areas also have more visible advertising for unhealthy foods than wealthier areas.¹¹⁸

The UK food retail environment encourages unhealthy foods consumption. Up to 40 per cent of foods purchased in supermarkets are on promotion, and unhealthy foods are more likely to be promoted.¹¹⁹ Promotions have been shown to increase the amount people buy, and locations such as end-of-aisle displays and checkouts are frequently used to promote unhealthy foods.¹²⁰

At the same time, nearly 2 million children in England live in food poverty,¹²¹ and less than one-fifth of 5-to-15-year-olds eat five portions of fruits and vegetables a day.¹²² In an affluent city like London, almost 1 in 10 children reports going to bed hungry.¹²³

The UK faces the dual challenge of confronting 'food swamps' in poor areas, by restricting the promotion of unhealthy food, while ensuring that retailers in poor areas offer affordable healthy food.

The UK Government has pledged to halve childhood obesity and reduce the obesity gap between children from the richest and poorest areas by 2030.¹²⁴ The UK introduced a sugary drinks levy and the world's first sugar reduction programme aimed at a 20 per cent reduction in the most popular products consumed by children.¹²⁵ The UK is also consulting on new legislation to ban unhealthy foods at checkout areas, store entrances and the end of aisles, as well as price promotions encouraging over-consumption of these products, such as 'buy one, get one free', multi-buy offers or unlimited refills.¹²⁶

Local authorities have been encouraged to use their planning powers to limit the opening of additional fast-food outlets close to schools, while the Mayor of London has banned advertising for unhealthy foods on the Transport for London network.¹²⁷

Recognizing that infancy and early childhood are critical times for establishing food preferences and dietary patterns, the UK has recently called for action to reduce sugar in commercial baby foods and end misleading labelling practices. Public Health England found that some sweet snacks marketed as suitable for babies and toddlers contain as much sugar as confectionery.¹²⁸

In parallel, the UK Government set up the Healthy Start Scheme to provide fruit and vegetable vouchers to low-income families with young children, which has helped increase these families' spending on fresh fruit and vegetables by 15 per cent.¹²⁹

Even though much remains to be done to tackle childhood obesity, the UK is paving the way to ensure that all children grow up in a healthy food environment. ■

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The role of food systems

The trends in children’s nutrition are clear: on the one hand, there have been some declines in undernutrition, notably in stunting, albeit at far too slow a rate to meet globally agreed targets. There is also evidence of some reductions in hidden hunger, but again at far too slow a rate. On the other hand, the proportion of children who are overweight is rising rapidly, even in countries that still struggle with undernutrition.

What explains these trends? In part, they reflect a world where children are increasingly able to satisfy their energy needs but not their *nutritional* needs. As part of the global nutrition transition described by Barry Popkin,⁷⁵ more and more people are moving towards modern diets high in saturated fats, trans-fats, sugar and salt. This transition is linked to a rising prevalence of diet-related NCDs. Low-quality diets are now believed to be the single biggest risk factor for the global burden of disease.⁷⁶

The result is that more children are surviving, but far too few are thriving – failing to develop to their full physical and mental potential. In such a world, we need increasingly to focus on the quality of children’s diets and ask this question: **Why are so many children eating too little of what they need, while an increasing number of children are consuming too much of what they don’t need?**

To answer this question requires getting to grips with **food systems** – everything that happens to bring food ‘from farm to mouth’. As work by numerous international experts – including the FAO, IFAD, the Global Panel on Agriculture and Food Systems

for Nutrition, and the High Level Panel of Experts on Food Security and Nutrition – has demonstrated, the processes and activities that shape what we eat today are becoming increasingly complex.^{77, 78, 79}

To better explain how these processes affect children, UNICEF worked with international experts to develop the Innocenti Framework on Food Systems for Children and Adolescents (see *below*).⁸⁰ This framework puts children’s diets at the heart of food-system analysis for two reasons: first, because children’s nutritional requirements are unique and critical; and second, because there are no ‘magic bullet’ solutions to improving children’s nutrition over the long term, other than having food systems that deliver nutritious, safe, affordable and sustainable diets for all children. Action is needed at different points in the food system – with synergistic actions in the health, water and sanitation, education, and social protection systems – (see *Chapter 4*) to both increase the supply of, and demand for, nutritious foods.

The Innocenti Framework has three main components – **drivers, determinants and interactions**.

Drivers

The ways in which societies supply and distribute food to children, the range of choices available to caregivers and consumers and the decisions that they take can all be affected by drivers that, at first glance, may appear distant from food systems. In recent decades, for example, factors such as rising incomes, technological innovation, marketing and globalization have all helped to transform food systems and the diets they deliver to children and adolescents.

Why are so many children eating too little of what they need, while an increasing number are consuming too much of what they don’t need?

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Determinants

The core of the Innocenti Framework consists of four determinants that

describe the processes, conditions and actors most directly involved in the production and consumption of food for and by children.

The processes and activities that shape what children eat today are becoming increasingly complex

BOX 1.2 | How can agriculture better support nutrition?

Agriculture is the foundation of all food systems and key to providing children with nutritious, safe, affordable and sustainable diets. However, the interaction between agriculture and children's nutrition is far from straightforward.

At one level, this reflects the reality that child nutrition goals may conflict with economic and political goals.⁸² For example, while investment in agriculture has improved productivity, food diversity has declined: just three crops (rice, wheat and maize) now account for nearly two thirds of the world's calorie intake.⁸³ At another level, this reflects the wide variety of food production systems globally – urban and rural, small and large, traditional and modern – all of which may affect nutrition outcomes in different ways.

Modern and industrialized food systems offer production efficiency gains and year-round access to low-cost foods, but they are increasingly oriented toward producing animal feed, industrial inputs for processed foods, and biofuels rather than food for primary consumption. This has both dietary and environmental impacts, including loss of biodiversity, soil and water contamination, and the production of greenhouse gases.⁸⁴

Smallholder opportunities

The dynamics are different in traditional food systems, where food safety and food loss are greater concerns.⁸⁵ Around four out of five of the world's rural poor make some or all of their living from agriculture,⁸⁶ many as smallholders – a loosely defined term that can be thought of as referring to small family-run holdings that produce a subsistence crop and one or two cash

crops. The decisions taken by – and options available to – smallholders can have major effects on the nutrition of some of the world's most disadvantaged children.

Smallholders face choices over whether to produce a more nutritious and diverse array of foodstuffs for the family's own consumption, or whether to sell what they produce to provide extra income. This income can be increased further if the family processes food before selling it; however, they may only be able to do this if they can access functioning markets and transportation.⁸⁷

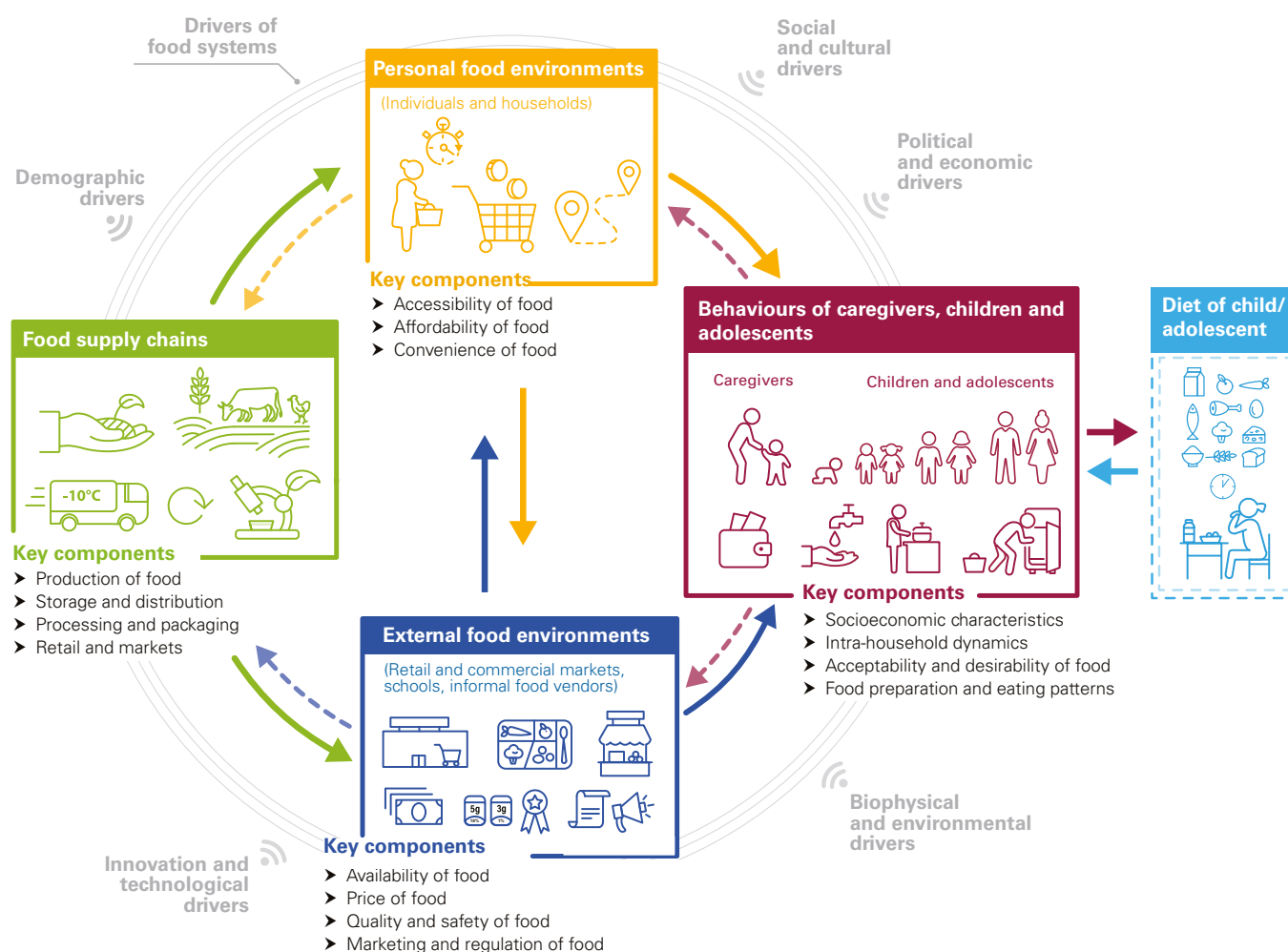
Another way in which smallholder agriculture can affect children's nutrition is if it leads to the empowerment of women, who play a major role in farm work, food processing and child feeding. Women's participation in agriculture has the potential to help shift control of household resources to them, which then become more likely to be directed toward child feeding and care.⁸⁸ However, programmes aimed at strengthening the role of women can unintentionally harm children's nutrition if they compete with child feeding and care – including breastfeeding – or impair women's own health and nutrition.⁸⁹ This underlines the need for initiatives for women in agriculture to be accompanied by other interventions, such as in nutrition counselling and support, behaviour change communication, and providing access to water, sanitation and health services.

While more work is needed to demonstrate how agriculture can best improve children's nutrition, the potential is clear, as is the certainty that fundamental change in children's nutrition cannot happen without the support of agriculture. ■

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The Innocenti Framework on Food Systems for Children and Adolescents

The Innocenti Framework identifies some of the key points in food systems where action can be taken to increase both the supply of, and demand for, nutritious foods for children and young people.



The Innocenti Framework puts children's diets at the heart of food-system analysis

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Food supply chains comprise all the actors and activities involved in producing, processing and distributing food (and, ultimately, to disposal or use of waste). Agricultural production is still the source of most of what children eat, and offers key opportunities for improving children's nutrition, for example by researching and developing more nutritious crops. Other interventions can include equipping smallholders and women to grow nutritious vegetables and to raise short-cycle livestock, such as poultry and goats, and developing mixed farming and cropping systems and aquaculture for fish production. There are also opportunities along the length of food chains to support better nutrition for children, such as fortifying foods with essential micronutrients, and reducing the use of saturated fats, trans-fats,

sugar and salt. Improved food storage and management can reduce food safety risks and contaminants, while minimizing food loss and spoilage.

External food environments describe, firstly, all the physical places where caregivers, children and adolescents go to purchase or consume food. What foods and food items are on offer in stores and markets do much to determine the accessibility, affordability and convenience of food choices. For families living in 'food deserts', for example, fresh produce may simply not be available (see *Chapter 3*). Also important in external food environments are marketing and advertising, which help to shape tastes and influence purchasing decisions.⁹⁰ Key interventions in external food environments to improve children's

Nutritional education and information are an important response to influence lifelong behaviour for healthier food choices, habits and overall nutrition



Traditional staples are the foundation of Uruma and her family's diet in Tanzania. She often struggles to find enough to feed her family. "The children sometimes go to school in the morning without eating anything," she says. When her husband earns a little extra, "I may return with meat, so the children can enjoy eating meat."

Produced/photographed by MAKMENDE

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nutrition can include enforcing standards on food fortification. In addition, a mix of taxes and tax incentives can lower demand for unhealthy foods and encourage the supply of healthy foods. Other actions can include regulation of packaging and labelling and of marketing, especially of foods targeted at children and young people (see *Chapter 4*).

Personal food environments represent the factors that help determine and, in many cases, limit the dietary choices of families and children. These include families and children's access to shops and markets and their purchasing power, which will determine the affordability and convenience of food (see *Chapter*

3). As well as a lack of income, lack of time is a significant burden. Rural women in particular must often balance unpaid farm work with their role as primary caregivers.⁹¹ Important responses can include providing families with cash transfers that, with appropriate nutrition counselling and support, can offer extra resources and desire to purchase nutritious food for children.⁹² There is also scope to address time poverty by reducing the burden of women's farm and domestic work. For example, improving access to household water sources can cut the amount of time women spend collecting water, and likewise, better tools can speed up planting and weeding, while day-care centres can support childcare.⁹³



In Mexico, Gabriela tries to feed her family healthy foods, such as salad at lunchtime, but six-year-old Ikal has other ideas. “Mom, can I have a candy?” he begs. Gabriela finds it overwhelming: “They’re just children,” she says, “Everything has pretty pictures on it. Everything ... has sugar. They’re still kids, so they want sweets all the time.”

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Like many young people, Indonesian teenager Rafsi is taking more of his own decisions about what to eat, especially when he hangs out with friends in the mall. Rafsi is trying to lose weight: “I go to the gym,” he says, “I hope I will lose more because still right now I’m overweight.” But it’s not easy: “It’s difficult to eat healthy when our friends are eating more delicious foods than healthy foods.”

Produced/photographed by MAKMENDE

The behaviours of caregivers, children and adolescents – or how families, children and young people procure and prepare food and how children are fed and supervised – is influenced by many factors. These include eating patterns, nutritional knowledge, taste preferences, appetite and levels of physical activity. Also important are socio-economic factors, such as food and dietary taboos, and the tendency in some cultures to prioritize boys and men over girls and women at mealtimes. Nutrition information, education and counselling are an important response to influence lifelong behaviour for healthier food choices, habits and overall nutrition.

Interactions

None of these four determinants stands completely alone. As the arrows in the framework indicate, they interact with each other, shaping and reinforcing each other in ways that can both help and harm children’s nutrition. For example, while the food offered in local markets helps shape the diets of children and families, it is in turn influenced by demand from children and families. These interactions show the importance of ensuring that policies to improve the supply of nutritious foods must also strengthen demand.

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Malnutrition can harm a child’s economic prospects and, as a consequence, broader socio-economic development in numerous ways

What are the economic impacts of children’s malnutrition?

The coming decades will see a dramatic shift in the contours of the world’s population – one that will see Africa become the centre of global population growth. By 2050, the population of Africa is forecast to have doubled since 2017, reaching a total of 2.5 billion people. In short, the future of humanity will be increasingly African. As populations age in much of the rest of the world, Africa over the coming decades will still be a young continent; in 2050, it will be the place where just over two out of five of the world’s children are born.⁹⁴

The emergence of a large and young labour force in such a short period of time will provide Africa – as well as India and some other countries in South and Southeast Asia – with the chance to harness their demographic dividend. But that potential will be realized only with improvements in human capital – people’s education, training, skills and health.⁹⁵ Malnutrition stands in the way of that happening.

The impact on children

There are numerous ways in which malnutrition can harm a child’s economic prospects and, as a consequence, broader socio-economic development. Stunting in the first 1,000 days is associated with poorer cognitive development and lower educational outcomes.⁹⁶ Evidence from a number of countries indicates that malnourished children spend less time in school, typically because of poorer brain development and school readiness, illness or because they start school

later in life and are more likely to have to repeat grades. In sub-Saharan Africa, for example, research has shown that children lost up to 2.5 years of schooling if there was a famine while they were in utero and during their childhood.⁹⁷

By contrast, there are also numerous examples of how better nutrition is associated with improvements in children’s school performance. In the 1940s, for example, the United States Government required bread to be fortified to help overcome widespread iron deficiency. Subsequent analysis showed improved rates of school enrolment.⁹⁸ Similarly, Tanzanian children who received intensive iodine supplementation in the late 1980s and 1990s spent up to around an extra half-year in school compared with children who had not been treated.⁹⁹ Studies on supplementation programmes in Guatemala¹⁰⁰ and in China¹⁰¹ also suggest that children improved their performance in areas such as mathematics and reading.

Perhaps the most direct way of demonstrating malnutrition’s effects on an individual’s economic prospects is to look at its association with reduced earnings – in effect, the impact of malnutrition on productivity. Available research indicated that the average lifetime lost earnings associated with stunting is US\$1,400 per child, ranging from under US\$300 in Tajikistan to over US\$30,000 in wealthier countries such as the Bahamas, United Arab Emirates, Kuwait and Qatar.¹⁰² Studies have also suggested that stunting is linked to lower earnings: according to one, an increase of one centimetre in height in adulthood was associated with a 4 per cent increase in wages for men and 6 per cent for women.¹⁰³

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An additional, and easily overlooked, way in which malnutrition can affect children's social and economic prospects is by fuelling conflict. There is growing evidence that poor economic and health status, including malnutrition, is associated with higher rates of armed conflict. According to one analysis in 2008, lowering the prevalence of under-5 malnutrition by 5 percentage points was associated with a decrease in the likelihood of conflict of up to 3.5 percentage points.¹⁰⁴ The reasons for this are not fully clear, but as John Boyd Orr, first Director-General of the FAO, once said, "We cannot build peace on empty stomachs."¹⁰⁵

All these impacts on the individual serve to undermine the ability of countries to develop their human capital, defined as the "aggregate levels of education, training, skills, and health in a population".¹⁰⁶ This loss is significant. According to the African Union's Cost of Hunger in Africa study, child malnutrition costs African economies between 1.9 per cent and 16.5 per cent of GDP every year.¹⁰⁷ More recent studies indicate that malnutrition continues to exert a heavy burden on Africa's economies.¹⁰⁸

Much less work has been done on estimating the cost of childhood obesity, especially in low- and middle-income countries. Overweight can have an impact on the broader economy by making individuals less productive – through lower levels of physical activity and higher rates of NCDs – and by raising the cost of healthcare to treat conditions such as hypertension, diabetes and stroke. According to estimates prepared for WHO, if current trends continue, economic losses in low- and middle-income countries from heart disease, cancer, diabetes and

chronic respiratory disease will reach more than US\$7 trillion over the period 2011–2025, equivalent to about 4 per cent of these countries' annual output.

Investing in nutrition

Nutrition must be seen as a cornerstone investment if the world is to achieve the Sustainable Development Goals by 2030. According to estimates by the World Bank and others, it would cost just an additional US\$8.50 per child per year to meet global targets for under-5 child stunting.¹⁰⁹ That's equivalent to just US\$5 billion a year. Two numbers help put that figure in perspective: it's a little less than the combined annual spend on advertising of around US\$7.2 billion a year by three of the world's largest food and restaurant multinationals in the early 2010s.¹¹⁰ It's equivalent to just under 1 per cent of the US\$620 billion that high-income and emerging economies spend each year on agriculture support¹¹¹ (which includes direct payments to farmers as well as tariff barriers and export subsidies).

Such investments have an impressive rate of return. Every dollar invested in reducing stunting generates estimated economic returns equivalent to about US\$18 in high-burden countries.¹¹² Even without these returns, investment in children's nutrition must be at the heart of any equity agenda. "Everyone puts all their eggs in the equality of opportunity basket," the former President of The World Bank, Jim Yong Kim, has said, "But we're essentially lying when 25% of children in the world are stunted. Inequality is baked into the brains of 25% of all children before the age of five. So the only way that we can realistically say there is equality of opportunity is if we bring stunting down to zero."¹¹³ ■

Every dollar invested in reducing stunting generates estimated economic returns equivalent to about US\$18 in high-burden countries

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PERSPECTIVE

Why is addressing children's nutrition important for a country's broader economic development?

Dr. Sania Nishtar
Special Assistant
to the Prime
Minister on
Poverty Alleviation
and Social
Protection,
Pakistan

After years of brutal conflict, Yemen has become one of the world's worst humanitarian crises and is descending into famine. Even if the conflict ends tomorrow, the consequences of this crisis will be long-lasting, not least because of the impact of malnutrition on brain development, which in turn shapes the cognitive abilities of future workforces. Today's food insecurity is starving Yemen of its future talent.

Unfortunately, malnutrition is not isolated to extreme hunger in warzones. Children around the world contend with multiple forms of malnutrition that go beyond undernutrition.

Many countries are grappling with the double burden of malnutrition. Undernutrition in young children and overweight later in life lead to higher risk of costly diseases, such as hypertension and diabetes. Both sides of the same coin of malnutrition can be on painful display within one country – quite feasibly within the same homes, classrooms and playgrounds.

Major diabetes epidemics in China, Cambodia and Ukraine have been linked to famines and starvation 40–50 years earlier. Severe food shortages in the Second World War could be an explanation for the current high rate of diabetes in Nauru, Singapore and Malaysia. This raises the possibility of future 'hotspots' of diabetes in regions that have droughts and famine or internal and regional fighting (e.g., the Horn of Africa and Yemen), once socio-economic conditions improve.

Malnutrition does not just lead to deaths and disease. It also undermines the human right to a healthy life, and negatively affects economic development by escalating healthcare costs and incurring productivity losses.

In the case of undernutrition, productivity losses are due to decreased physical and intellectual capacity, whereas in the case of obesity, lost workdays, lower productivity at work, mortality and permanent disability come into play.

The impact of these costs on a country's gross domestic product (GDP) can be massive. In Asia, the annual GDP losses from low weight, poor childhood growth and micronutrient deficiencies average 11 per cent. The global economic impact of obesity is estimated to be US\$2 trillion or 2.8 per cent of global GDP – roughly the same economic cost as smoking or armed conflict. Cumulatively, the estimated impact on the global economy of different forms of malnutrition could be as high as US\$3.5 trillion a year, or US\$500 for each individual.

Perhaps the most compelling association of nutrition with a country's economic development is seen in human capital. In 2018, the World Bank launched a Human Capital Index, emphasizing that this digital age requires countries to urgently invest in their people if they hope to compete in the economy of the future.

The Human Capital Index is a composite measure, factoring in child survival, years of

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schooling and stunting. It has enabled the insight that malnutrition is therefore directly responsible for the loss of human capital.

Individuals who have had stunted growth may lose schooling and experience delayed entry into the labour force, meaning that 43 per cent of children aged under 5 in low- and middle-income countries are at elevated risk of poverty because of stunting.

Investing in child nutrition would produce a long-term impact on development. The Copenhagen Consensus has indicated that for every dollar spent on nutrition in the first 1,000 days of a child's life, the benefit could be an average of US\$45.

An average annual investment of US\$7 billion over the next 10 years would be sufficient to achieve the global nutrition targets to reduce child wasting and stunting and maternal anaemia and to improve breastfeeding rates. With this investment, 3.7 million children's lives could be saved by 2025, with at least 65 million fewer stunted children, 105 million more children exclusively breastfed and 265 million fewer women suffering from anaemia compared to 2015. Without this investment, development opportunities will be missed.

Costly as malnutrition is, the solutions do not need to be. *The Lancet* estimates that over 820,000 children's lives could be saved through measures such as breastfeeding babies exclusively immediately after birth, and continuing to feature breastmilk as part of their diet up to 2 years of age and beyond.

However, the usefulness of free measures should not be used to understate how effective cash can be in the hands of those at the sharp end of malnutrition. Following the Pakistan Government's new prioritization of nutrition, I have been invited to lead the Benazir Income Support Programme (BISP), which is a national cash transfer system.

The US\$1.15 billion programme currently gets money into the hands of over 5.6 million poor and marginalized families. Independent evaluation has shown that the programme empowers women in particular, changing how they are viewed in their communities. I look forward to integrating a new nutrition-centred initiative within its framework in order to address malnutrition further.

There is increasing awareness and evidence that investments to reduce malnutrition do pay off and are much needed. For the sake of our health and economies, both now and in the future, countries need to take on the many-headed hydra that is malnutrition. ■

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02 FEEDING A CHILD FOR LIFE

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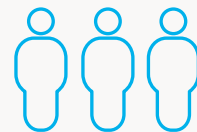
From the womb to adolescence, children at every stage of life have unique nutritional needs, eating behaviours and dietary influences, and are harmed in different ways by malnutrition. Early childhood is a time of rapid growth and nutritional vulnerability. School-age children are exposed to broader influences that affect their diets and food choices. Adolescence presents a window of opportunity for establishing healthy, lifelong nutrition.



- Malnutrition during pregnancy and early childhood can adversely affect brain development.



- Generally, school-age children around the world are eating too little nutrient-rich foods and too many unhealthy snacks.

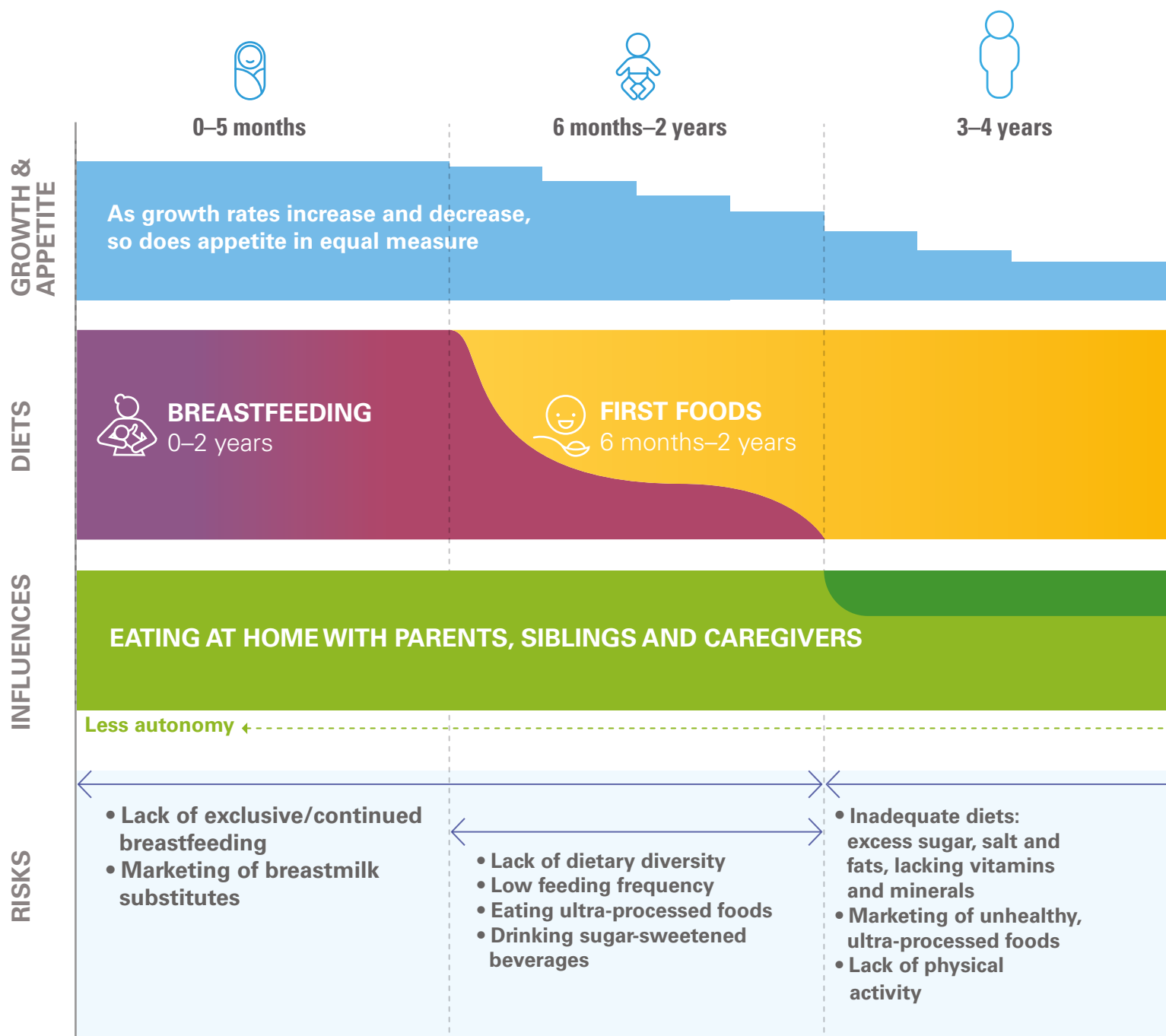


- Obesity in adolescence can have lifelong negative effects on the brain, contributing to early onset of cognitive dysfunction during ageing.

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Food and nutrition across childhood

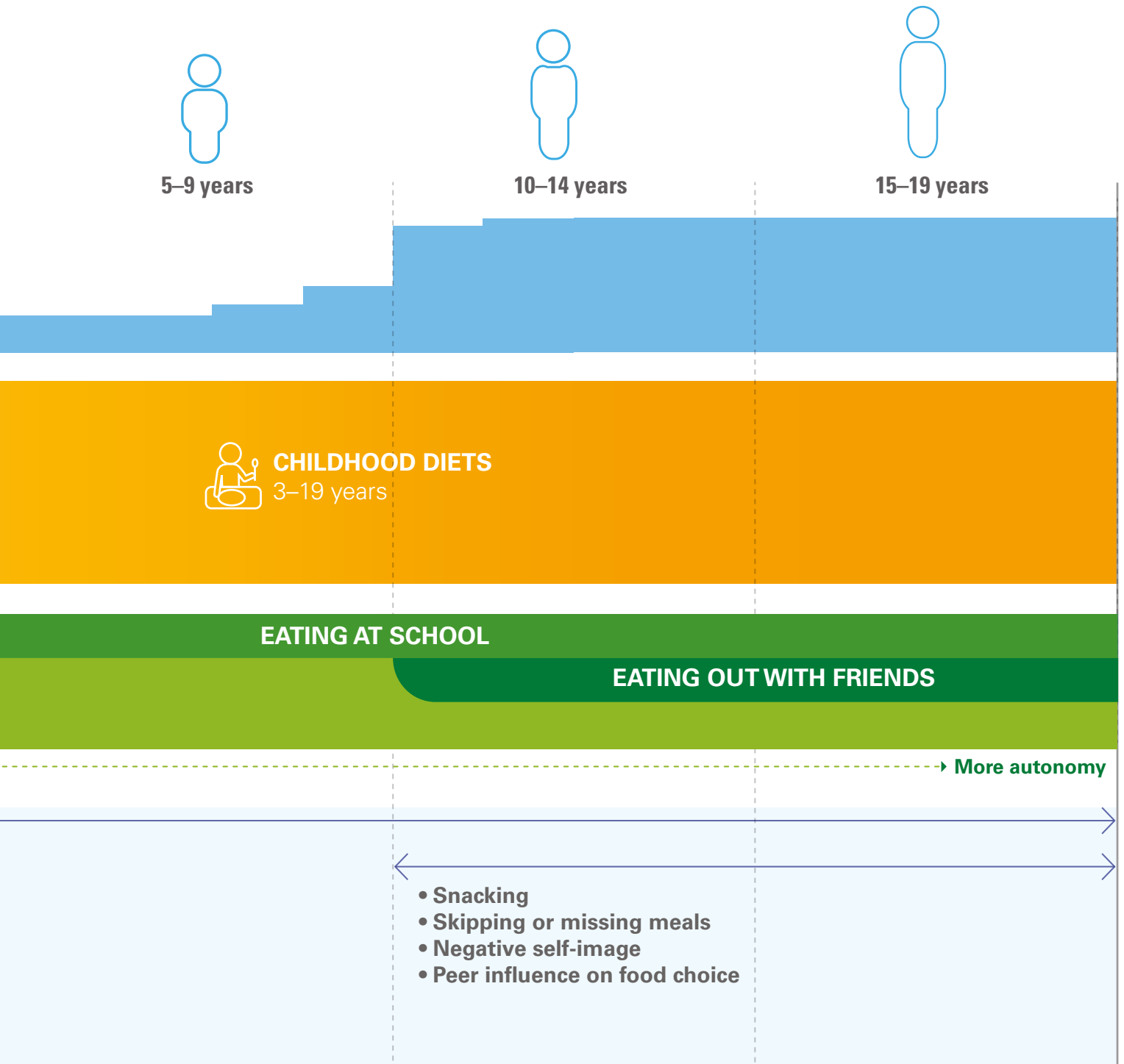
At all ages, children are not eating diets with enough nutrients or diversity, and they are eating too much sugar, salt and fat. The risks at each age can lead to one or more forms of malnutrition: stunting, wasting, hidden hunger or overweight and obesity. These conditions can affect school performance and lifelong economic opportunities, and present health risks into adulthood.



Source: Elizabeth Fox, 'Characteristics of children's dietary needs, intake patterns, and determinants that explain their nutrition behaviors' (unpublished).

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**At every stage of childhood,
children have unique
nutritional needs, risks
and eating behaviours**



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Lack of proper nutrition during the early years can have lifelong consequences

Introduction

Across every stage of childhood – from the womb until adulthood – a child’s nutritional needs, and the behaviours and influences on diet evolve and change. An infant undergoes vast physiological changes week by week. As children start school, eating patterns and diet can change drastically. Later, adolescents have opportunities to establish lifelong healthy eating habits, yet are vulnerable to the long-term effects of overweight and obesity. Proper maternal and child nutrition in the early stages of life lead to lower health risks across the life course and the prevention of non-communicable diseases (NCDs).¹ An understanding of these differences across childhood is important for the design of policies and programmes that support child nutrition effectively.

As a child grows, the main influencers on diet shift gradually from mainly parents and other caregivers in the early years to the staff of day-care centres and schools and, finally, to peers and friends in the school-age years and adolescence. Food marketing and broader social forces affect what parents and caregivers feed their children, and act more directly on children’s food choices as they grow older.

Early years: Vulnerability and opportunity (the first five years of life)

Early childhood is a time of rapid physical growth and brain development. Lack of proper nutrition and exposure to illness and infection during these early years can have lifelong consequences on educational attainment and health

and economic outcomes, especially for children from the poorest and most marginalized communities.

The first 1,000 days – from the point of conception to around the child’s second birthday – are especially crucial. Poor maternal nutrition before conception and while the child is in the womb, the absence of exclusive breastfeeding in the first six months, and the inability of caregivers to provide a diverse and nutritious range of ‘first foods’ can lead to stunting, wasting and micronutrient deficiencies. For children and their communities, the consequences can be profound and lifelong.

Impact of maternal malnutrition and malnutrition in early childhood

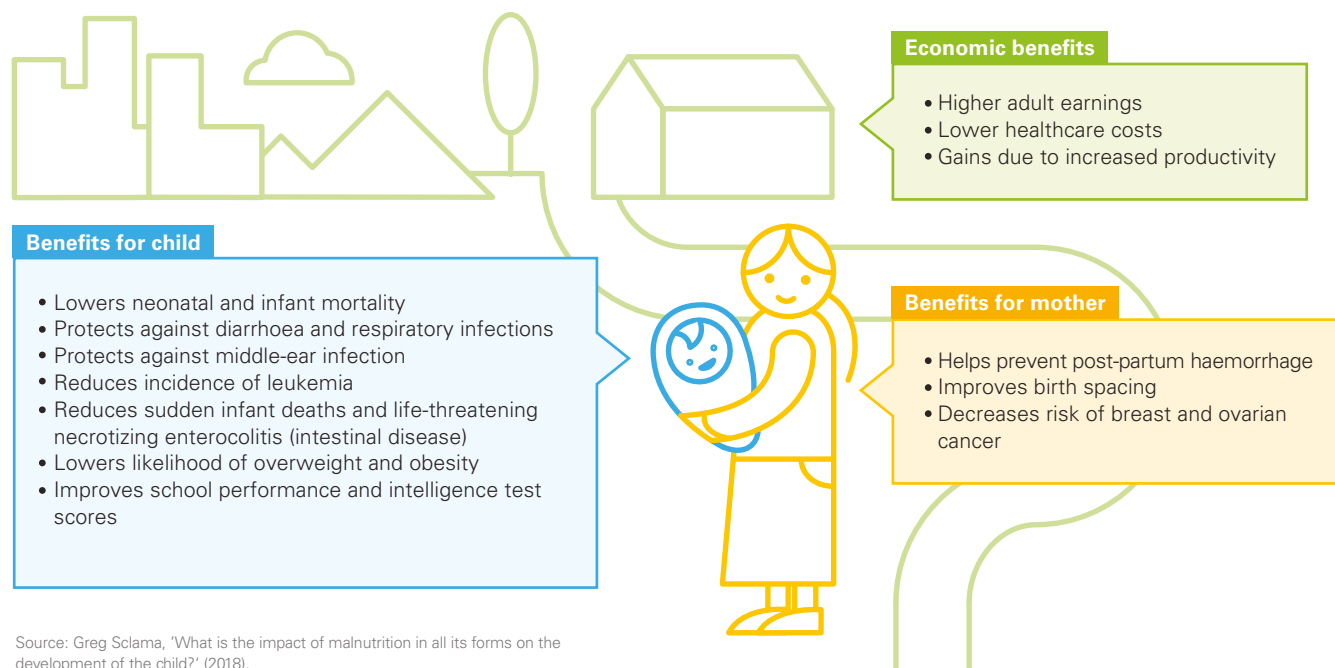
Good nutrition starts even before birth. Poor maternal nutrition affects the child while in the womb and during childbirth.

Maternal malnutrition, in the form of underweight and anaemia, increases the risk of pre-term birth and low birthweight, which in turn increase the risk of neonatal death, stunting and wasting. In addition, maternal overweight is a common complication of pregnancy;² it increases the risk of gestational diabetes and pre-eclampsia, a potentially life-threatening complication, and can lead to difficulties in labour and higher rates of post-partum haemorrhage. There are risks for the child too, including pre-term birth,³ low birthweight, not initiating breastfeeding, and an increased risk of overweight later in life.⁴

The developmental demands of the foetus increase micronutrient requirements; many pregnant women experience hidden hunger or micronutrient deficiencies (see *Chapter 1*). Iron deficiency can lead

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How breastfeeding helps the mother and child



to anaemia. In fact, iron deficiency is the most frequent cause of nutritional anaemia.⁵ Folate prevents neural-tube defects such as spina bifida in the foetus.⁶ Calcium reduces the risk of pre-eclampsia and pre-term birth.⁷ Vitamin A supports immune function and foetal development, especially during the third trimester.⁸ Finally, a lack of zinc in mothers is associated with low birthweight, poor foetal neural developments, pre-term delivery and increased neonatal mortality.⁹

While the effects of nutrition on the brain vary across childhood, brain development is fastest during the early years. Malnutrition during pregnancy and early childhood can adversely affect brain development, affecting cognition, school readiness, behaviour and productivity into the school-age years and beyond. Providing essential energy, protein, fatty acids and micronutrients to

a child during this period can establish lifetime brain function. A well-nourished child can interact with the environment and caregivers in a way that supports further healthy brain development.¹⁰

The power of breastfeeding

The wide-ranging benefits of breastfeeding – for a child's healthy immune system, brain development and microbiome – are well documented and reflected in a global consensus within the nutrition community. UNICEF and WHO recommend exclusive breastfeeding for the first six months and continued breastfeeding up to two years old or beyond. As the World Bank's Keith Hansen memorably wrote in *The Lancet* in 2016, "If breastfeeding did not already exist, someone who invented it today would deserve a dual Nobel Prize in medicine and economics."¹¹

Breastmilk is not just food – it's a powerful medicine tailored to the infant's needs

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Only 2 out of 5 newborns begin breastfeeding in the first hour of life

Breastfeeding has profound benefits for the child, especially in the first hour of life. Colostrum, the first milk produced by a mother, protects an infant's immature immune system against infection and inflammation.¹² Babies who begin breastfeeding in their first hour have a much lower risk of dying, even compared with babies who begin breastfeeding later on in their first day.¹³

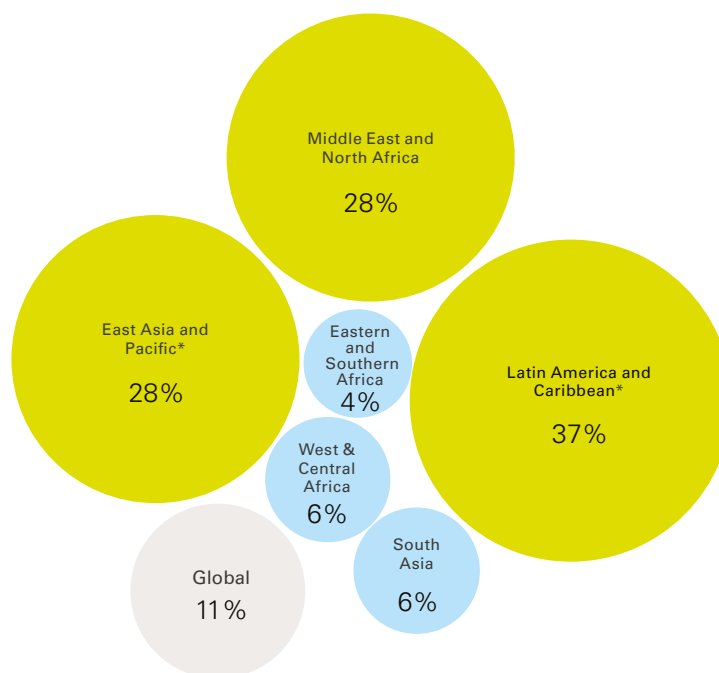
Breastmilk is not just food – it's a powerful medicine tailored to the infant's needs that can significantly reduce the risk of death.¹⁴ Universal breastfeeding could save the lives of 820,000 children under 5 annually worldwide. Breastfed children also have much lower rates of diarrhoea and

respiratory-related disease. Other benefits include improved school performance¹⁵ and higher adult earnings, as well as improved physical well-being. Growing evidence also points to breastfeeding reducing overweight, obesity and chronic diseases such as diabetes later in life.¹⁶

The dividends from breastfeeding are particularly high in lower-income countries, where families are often unable to access clean water and healthcare. Even in high-income countries, breastfeeding is still important for health and healthy growth and development. For example, it reduces sudden infant deaths and life-threatening necrotizing enterocolitis, a potentially fatal inflammation of the gut that affects mostly premature infants.

FIGURE 2.1 | Percentage of infants aged 0–5 months fed infant formula, by UNICEF region, 2018

The rise in use of breastmilk substitutes is an area of growing concern



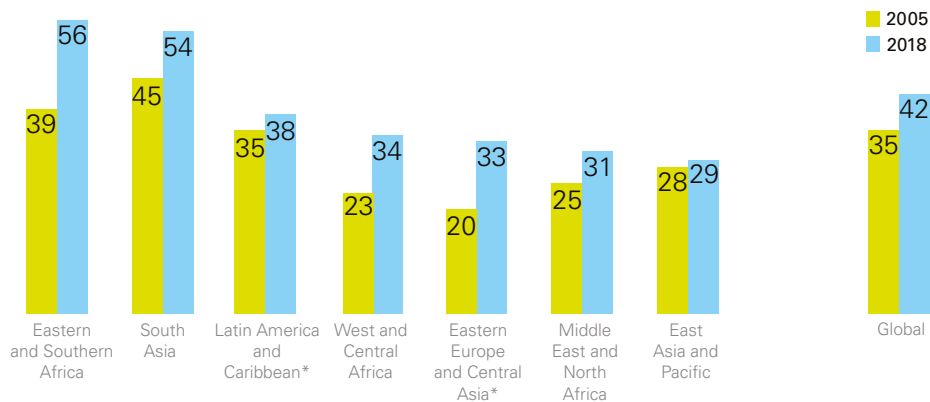
Notes: Between 2008 and 2013, sales of (typically cow's) milk-based formula grew by 41 per cent globally and by 72 per cent in upper middle-income countries such as Brazil, China, Peru and Turkey. Analysis based on a subset of 73 countries with available data between 2013–2018, covering 61 percent of the global population. Regional estimates are presented only where available data represents at least 50 percent of the region's population.

*To meet adequate population coverage, East Asia and Pacific does not include China and Latin America and Caribbean does not include Brazil. Data not available for Europe and Central Asia and North America.

Source: UNICEF global databases, 2019.

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FIGURE 2.2 | Trends in percentage of infants aged 0–5 months exclusively breastfed, by UNICEF region, around 2005 and around 2018



Many regions have made gains in exclusive breastfeeding

Notes: Analysis based on a subset of 80 countries with comparable trend data covering 74 per cent of the global population for around 2005 (2003–2008) and for around 2018 (2013–2018). Regional estimates are presented only where available data represents at least 50 percent of the region's population.

*To meet adequate population coverage, Latin America and Caribbean does not include Brazil and Eastern Europe and Central Asia does not include Russian Federation.

Source: UNICEF global databases, 2019.

Mothers benefit from breastfeeding too. It helps prevent heavy bleeding after birth and accelerates the contraction of the uterus. In addition, because lactating mothers are less likely to ovulate while breastfeeding, it improves birth spacing. There is also robust evidence of protection against breast and ovarian cancer,¹⁷ some evidence of a reduced risk of type 2 diabetes, and a reduction of hypertension and lower cardiovascular risk among mothers who breastfeed.¹⁸

Why are so many children not breastfed?

Despite these benefits, far too many babies are not breastfeeding optimally. Only just over two out of five (44 per cent) of newborns begin breastfeeding in the first hour of life and around the same proportion (42 per cent) of children under six months are exclusively breastfed. Why?

The answer is complex, but it includes factors such as the promotion of breastmilk substitutes, social and cultural taboos against breastfeeding, the struggle many women face to balance work with childcare, and lack of support for breastfeeding.

Breastmilk substitutes

In the first three days of life, 43 per cent of newborns worldwide are given liquids or foods other than breastmilk, most commonly sugar water, honey, tea, animal milk, infant formula or plain water.¹⁹ In West and Central Africa, water is the most common liquid given to infants in the first three days after birth, potentially exposing them to pathogens and other life-threatening substances. Elsewhere, many infants in Latin America and the Caribbean do not receive breastmilk at all and receive breastmilk substitutes – in Mexico, 48

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SPOTLIGHT

A day is (almost) never enough: The daily life of a breastfeeding working mother in rural Laos

Xaiathon lives in Houychengkao Village in rural Laos. At 33 years old, she has four sons ranging in age from 2 months to 15 years. Together with her husband, she farms a small lot and maintains a home with their children.

“My day starts very early, because of the long walk to the farm,” she says. Because of this, her breastfeeding practice is not as regular as her doctor has advised. In addition to farm work and preparing meals for the boys, Xaiathon gathers firewood, feeds the hog and cattle, does the laundry, cleans the house, and helps out at a neighbour’s farm to augment their barely-enough harvest.

She’s usually only able to breastfeed Kaka (her youngest son) when she’s at home in the morning before going to the farm (which is an hour’s walk from their home), and again in the evening when she’s back. “It is a challenge to keep up because of the farm work. Sometimes when it rains, I can’t go back home to breastfeed them, so in the rainy season I make sure there’s rice porridge left at

home. A few times I’ve had my fellow mothers in the neighbourhood breastfeed my boys,” she says.

To make up for the lack of breastmilk during the day, she chews pieces of meat and mixes them with the rice porridge that she has prepared for Kaka in the morning. Her heavy workload means Xaiathon is also unable to follow through with her visits to the health centre in town. “I would rather just spend the time at the farm instead,” she says, adding that their meagre harvest is the only source of income for their family of six.

As the sun sets and her husband approaches their home, the boys run to greet him, eager to see what fruits he has got for them along the way. For Xaiathon, the day is only halfway done: she still has to prepare dinner, do the dishes and feed her little son. She will try to get some rest as soon as the boys are back from evening playtime with their neighbours, mindful of another early start the next day. ■

Before heading out to the farm, Xaiathon gathers and cuts the fire wood, and clears their backyard garden of bushes. “I also consider this a bit of warm-up, before the real hard work at the farm awaits,” she says with a smile. © UNICEF/Laos/2018



per cent of infants 0–5 months and 33 per cent of children 6–11 months consume infant formula, while only 35 per cent of children under 2 consume breastmilk.²⁰

The rise in the promotion, sales and use of breastmilk substitutes, including follow-on formulas and toddler milks, is an area of growing concern. These products are often marketed with misleading claims that they improve young children's IQ and immune systems, or are necessary for healthy growth. Between 2008 and 2013, sales of (typically cow's) milk-based formula grew by 41 per cent globally and by 72 per cent in upper middle-income countries such as Brazil, China, Peru and Turkey.²¹

The fastest growing category of formula milk is toddler milks, marketed for children aged between 13 and 36 months. Global sales grew by 53 per cent between 2008 and 2013.²² Unnecessary for healthy growth, these drinks may also increase the child's preference for sweet tastes.²³ Compared with formulas, which contain added sugars, breastmilk exposes children to a broader range of tastes and flavours from the mother's diet, thus preparing children for a more diverse diet as they grow older. Most toddler milks contain a combination of powdered milk without its natural fats, and corn syrup and other added sweeteners and vegetable oil.

Public health professionals have raised concerns about the rise in the use of toddler milks. "My view is that these companies created a fake feeding period that they filled with this new product," New York University's Jennifer L. Pomeranz has said. "We're adding in now another few years of processed food consumption that didn't previously exist."²⁴

Social norms and healthcare

Social norms, taboos and traditional practices significantly influence feeding behaviours. For example, many cultures believe babies should not consume colostrum and should be fed another liquid, such as sugar water, honey or animal milk, before beginning breastfeeding.

To begin breastfeeding immediately after childbirth, mothers need support from health professionals. However, a 2018 UNICEF report found that the presence of a medical doctor, nurse or midwife at the time of delivery did not necessarily support the early initiation of breastfeeding.²⁵ Only 34 per cent of newborns delivered by a skilled birth attendant began breastfeeding within the first hour of birth in South Asia, while the rates are only 45 per cent in Middle East/North Africa, 47 per cent in Latin America and Caribbean, and 48 per cent in East Asia and Pacific. Another emerging concern is the rise of caesarean delivery. Research in South Asia has found that caesarean delivery is a significant predictor of delayed initiation of breastfeeding.²⁶ Across 51 countries, early initiation rates among newborns delivered by vaginal birth were more than twice as high as initiation rates among newborns delivered by caesarean section.²⁷

Mothers living with HIV can breastfeed without negative consequences for their own health and the health of their children. When these mothers take antiretroviral medicine consistently throughout the breastfeeding period, the risk of transmitting HIV to their children is extremely low. To achieve safe breastfeeding among mothers living with HIV, scaling up treatment services and adherence counselling and support within health facilities at the community level are required.

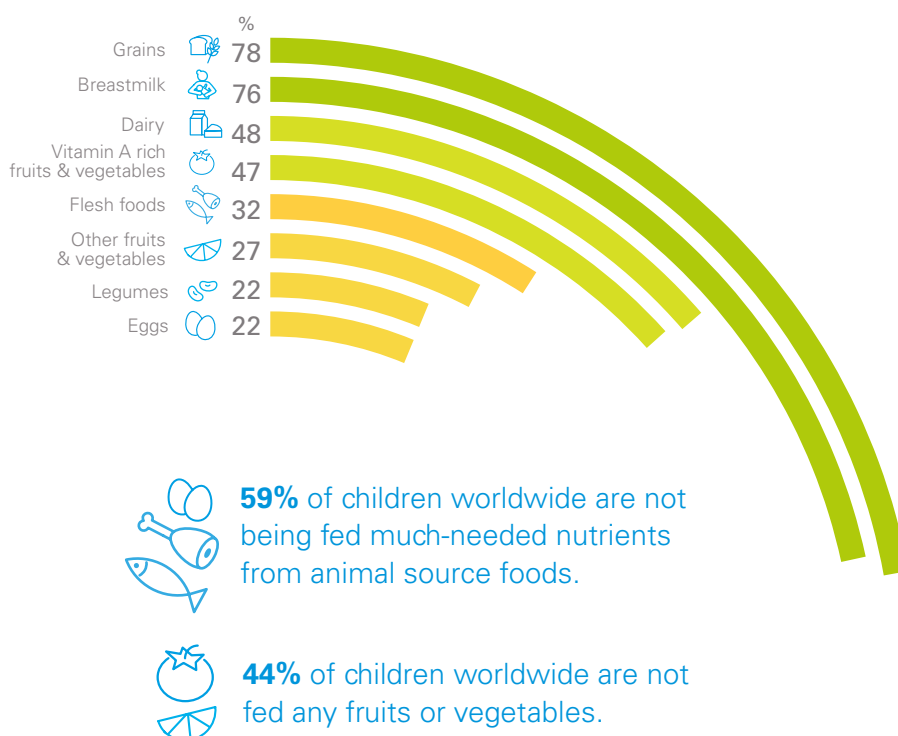
Social norms, taboos and traditional practices significantly influence feeding behaviours

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What are young children eating?

The importance of first foods

FIGURE 2.3 | Percentage of children aged 6–23 months fed food groups, by type, global, 2018*



When children start eating soft, semi-solid or solid foods at 6 months old, they need nutritious and safe diets with a range of nutrients to grow well.



Without enough diversity in children's diets, they may not get enough nutrients to grow well, which can take a devastating toll on children's bodies and brains. **UNICEF and WHO recommend that children at this age eat a minimum of five of eight food groups.**

FIGURE 2.4 | Percentage of children aged 6–23 months eating at least 5 of 8 food groups (Minimum Dietary Diversity), by UNICEF region, 2018**

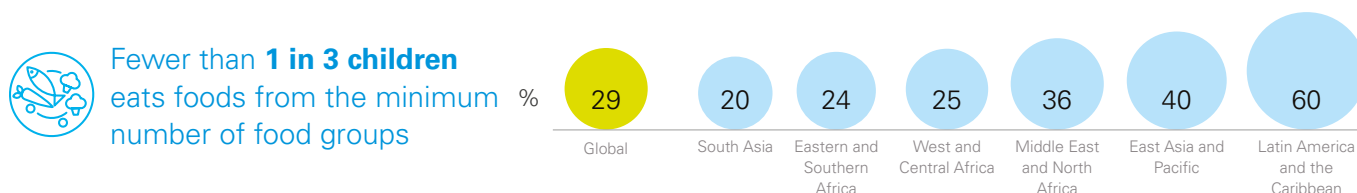
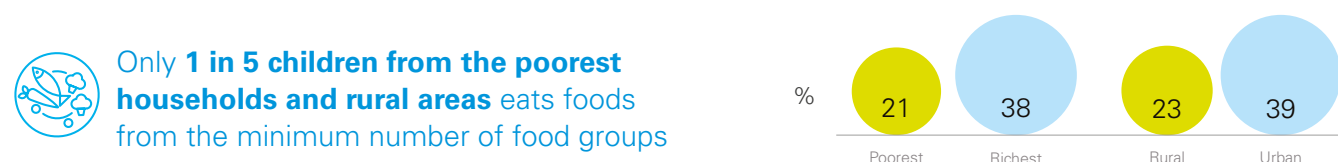


FIGURE 2.5 | Percentage of children aged 6–23 months eating at least 5 of 8 food groups by wealth quintile and place of residence, global, 2018***



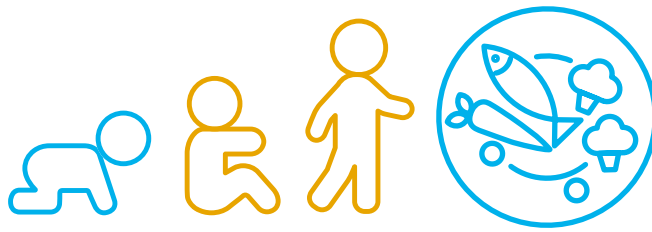
* Analysis based on a subset of 71 countries with data available between 2013–2018 covering 61 per cent of the global population.

** Regional and global estimates based on the most recent data for each country between 2013–2018.

*** Analysis based on a subset of 74 countries with disaggregated data available between 2013–2018.

Source for all figures pages 60–61: UNICEF Global Databases, 2019.

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2 in 3 children aged 6–23 months are not eating foods from the minimum number of food groups

FIGURE 2.6 | Percentage of children aged 6–23 months fed food groups, by type, by World Bank income group, 2018

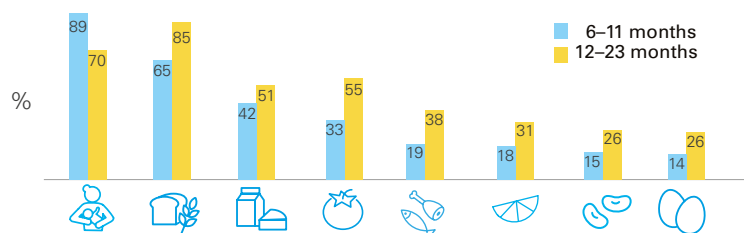


While the vast majority of young children consume breastmilk, they are not eating enough animal source foods, fruits, legumes or vegetables and rely too heavily on grains.

Except for breastmilk, the percentage of young children consuming any of the other 7 food groups is systematically higher in upper-middle-income countries than in low- and lower-middle-income countries.

The percentage of children consuming non-dairy animal source foods such as eggs, meat, poultry and fish in upper-middle-income countries is nearly twice as high as those in low- and lower-middle-income countries.

FIGURE 2.7 | Percentage of children aged 6–23 months fed food groups, by type and age, global, 2018



Younger children are eating less diverse diets compared to children 1–2 years of age.

Note for Figure 2.7: Analysis based on a subset of 71 countries with data available between 2013–2018 covering 61 percent of the global population. Income groupings are based on the FY19 World Bank income classification. Estimates by World Bank income groups are only displayed if available data represents at least 50 percent of the population.

*To meet adequate population coverage, upper-middle-income countries do not include Brazil, China and the Russian Federation.

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Children aged 6–23 months can suffer lifelong consequences if they eat unhealthy diets that lack diversity and rely on foods high in sugar and fat and low in essential nutrients

Balancing work with childcare

Unfortunately, working mothers worldwide face barriers to breastfeeding. Mothers in the workforce need a supportive environment, including paid maternity and parental leave and breastfeeding breaks for working mothers. In a 2015 study involving 11,025 participants from 19 countries, maternal employment was the most frequently cited barrier to exclusive breastfeeding.²⁸ Attention paid at a national level to supporting working mothers in the workplace can have significant effects. Viet Nam, for example, extended paid maternity leave in 2012 from four to six months – a bold departure from other maternity leave policies in Southeast Asia. Since then, the government has mandated all workplaces with a substantial female workforce to offer childcare facilities and lactation spaces.²⁹

The importance of complementary foods and why children are not getting them

When children are around 6 months old, breastmilk is insufficient to provide all the energy and nutrients they need. Their nutritional needs for growth and development between 6 and 23 months are greater per kilogram of bodyweight than at any other time of life, making them especially vulnerable to nutritional deficiencies and growth faltering. Introducing a healthy and diverse range of complementary foods along with breastfeeding can help protect against illness and death, while also ensuring healthy growth and development and preventing overweight/obesity later in life. Equally, children between 6 and 23 months can suffer lifelong consequences if they

eat unhealthy diets that lack diversity and rely on foods that are high in sugar and fat and low in essential nutrients.

It is recommended that infants start eating complementary foods at 6 months, but globally only over two thirds of infants aged 6–8 months are eating complementary foods. However, far too many begin much earlier. Nearly half of children 4–5 months of age and around 15 per cent of infants 2–3 months of age are already eating foods in Latin America and Caribbean and East Asia and Pacific regions.³⁰ In the United States, 21 per cent of infants 0–5 months of age consume grains, and this is higher among African-American infants (34 per cent).³¹

Starting from 6 months of age, children benefit especially from foods of animal origin, including meat, fish, eggs and dairy products, which are effective in providing them with essential nutrients and vitamin A, iron, zinc and calcium that are so needed between the ages of 6 and 23 months. Animal-source food (ASF) supports growth and physical activity and strengthens cognitive performance. ASF is densely packed with a range of essential micronutrients, well suited to the smaller stomachs of younger children. Stunting in early childhood is also associated with low consumption of ASF.³² But ASF – especially eggs and dairy – are expensive in low-income, rural areas, and consumption is lower (see *Chapter 3*). Globally, only two in five children are being fed ASF. Fish – which is relatively cheap and protein-dense with micronutrients – is a major part of young children’s ASF diets in lowland areas of Africa and Asia.³³

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SPOTLIGHT

Complementary feeding and behaviour change in Rwanda

Denise is a voluntary community health worker in Akabacuzi Village, where the legendary 1,000 hills of Rwanda begin to slide into the drier, flatter savannahs. Twenty-two children in her village used to suffer from undernutrition, but today, not a single child is considered either severely or moderately undernourished. Much of this improvement is due to Denise's efforts to ensure parents know what and how to feed their youngest children and put that knowledge into practice.

Through cooking sessions in her home, Denise demonstrates techniques to prepare nutritious food. Recently, she showed other mothers how to make beet juice, which is rich in vitamins and minerals. Mothers

with children in their arms gathered to share the juice, poured into plastic cups. Previously, parents in this community would have thought it natural to feed young children a diet heavy in carbohydrates such as potatoes. Now they know this is not enough: diverse fruits, legumes, grains, vegetables, and sources of protein such as eggs, fish, meat and dairy products need to be a regular part of their diet.

Denise and her fellow community health workers across Rwanda are in the vanguard of the fight against undernutrition, for which prompting behaviour change is a core strategy. To encourage better use of local resources, the government rolled out the '1,000 Days for 1,000 Hills'

campaign, which pushed out messages across various channels, including community radio stations, community health workers (who hold monthly growth-monitoring sessions and cooking demonstrations), agricultural technicians (who teach communities to create kitchen gardens), and members of village savings and loans groups. Parliamentarians, religious leaders and journalists also helped spread campaign messages.

"At first, people did not think about feeding children vegetables and other healthy foods," Denise says. "Now we know what a balanced diet is. As long as we keep informing and encouraging people, no more children here will be malnourished." ■

During a nutrition session, Denise, a Community Health Worker, demonstrates how to prepare beet juice for a group of women in Gatsibo District, Rwanda. © UNICEF/UN0301144/Noorani



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Fruits, vegetables, legumes, nuts and seeds are also important, not only as good sources of vitamins, minerals and fibre, but also because children who learn to enjoy eating a variety of fruits, vegetables, legumes, nuts and seeds are likely to go on eating them into adulthood.

Fortification

In many parts of the world, local foods alone cannot meet young children's high nutrient requirements. Fortified complementary foods or multiple micronutrient powders can help close these gaps. Around the world, a range of fortified blended foods high in proteins and micronutrients are distributed through social protection and supplementary feeding programmes, to provide extra food and nutrients beyond what is normally provided at home.³⁴

For instance, fortification products such as micronutrient powders enable caregivers to add essential vitamins and minerals to foods prepared at home for young children, reducing forms of hidden hunger, such as iron deficiency and anaemia. As of 2017, programmes providing micronutrient powders had been implemented in at least 47 countries, reaching over 16 million children aged 6–59 months. Infants and young children also benefit from eating large-scale, centrally processed fortified foods such as iodized salt, iron-fortified flours and vitamin-A-fortified oil. For example, in Nairobi, Kenya, such products meet around a quarter of the vitamin A requirement and half the iron requirement of children between 6 and 23 months of age.³⁵

Finally, biofortification – the process of breeding staple food crops with

higher micronutrient content – can reach vulnerable young children living in rural areas with limited access to diverse diets and commercially marketed fortified foods.³⁶ In 2017, an estimated 5 million under-5s in 14 countries in Africa, Asia and Latin America were consuming biofortified staple foods, including iron-rich beans, provitamin-A-rich maize, cassava and sweet potato, and zinc-rich wheat and rice.

Influences on young children

As any parent knows, infants and toddlers can be fussy eaters. Taste and food preferences can change from week to week and parents often offer what the child prefers. Young children's innate preference for sweet foods is helping to drive the increase in the consumption of commercial snack foods such as cookies, cakes and sweets and sugar-sweetened beverages in low-income countries.³⁸ A 2016 study of feeding practices among young children in Dakar, Dar es Salaam, Kathmandu and Phnom Penh found that the biggest reason for mothers feeding their children chocolates, sweets, cookies, chips or crisps, and cakes was that "the child likes it", far outweighing other factors such as affordability, convenience or perceptions that the foods were healthy.³⁹ The study found that, in all four cities, young children were more likely to eat commercially produced snack foods than foods rich in micronutrients, such as leafy green and orange-fleshed vegetables.

At the same time, a growing body of evidence from high-income countries indicates that commercial foods available on the market do not always deserve the 'healthy halo' that they tend to have among parents. Evidence of widespread inappropriate promotion of commercial

Children who are hungry at school struggle to pay attention and score worse on cognitive tests



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SPOTLIGHT

Mothers' clubs take a stand against malnutrition in Haiti

Jacqueline Saintil is determined to breastfeed her 3-month-old baby James exclusively until he is 6 months old and then to give complementary food in addition to breastmilk to keep him healthy. "My 5-year-old Ervens was not exclusively breastfed. After three months, I gave him water and food almost every day. He was not a very strong baby," she explains.

The 25-year-old mother, who sold second-hand clothes before she gave birth to James, grows beans in a small garden that she can now harvest and sell because of the training in nutrition she has received. "I will make vegetable soup, with corn and dry fish, to feed my son when he's six months," she adds.

Jacqueline acquired her nutritional knowledge from the local Paillant Mothers' Club in her town of Les

Nippes. Thanks to a set of cards with simple drawings, she and 29 other women were taught how to help prevent their children catching diseases or suffering from malnutrition. They learned that breastmilk contains all the nutrients required by babies and no other food or liquid is necessary until the age of 6 months. They were also shown how to make nutrient-dense meals of purees using local ingredients.

In mothers' clubs, community counsellors advise parents and caretakers of children aged under 5. Each week, mothers meet to discuss one theme on child well-being and development.

A total of 411 women have been trained in 20 clubs in Les Nippes. The club is participative, interactive and joyful. The training raises women's

self-esteem and social status within their communities. Women were so proud of their achievements that they organized a graduation ceremony at their own expense. According to Beatrice Rubin of the Paillant health centre, vaccine coverage is nearly 100% for ante- and post-natal consultations as women from the club educate their peers. Referrals of malnourished children are more numerous since the course started.

Prevention of malnutrition is key in Haiti, which is characterized by chronic poverty coupled with a deep socio-economic crisis. Only 40% of infants aged under 6 months are exclusively breastfed, 11% of 6–23-month-old children are fed following minimum acceptable feeding practices, and more than 1 in 5 children aged under 5 years is stunted.³⁷ ■

Jacqueline breastfeeds 3-month-old James. © UNICEF/Haiti/2019/Seck



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As children grow into toddlerhood, they start to choose their own food and are exposed to new influences aside from their parents and caregivers

foods includes labelling that encourages early introduction, products with high amounts of sugar, use of artificial flavours, inappropriate consistency for developing eating behaviours, and various nutritional and health claims.⁴⁰

As children grow into toddlerhood, from the ages of 2 to 4 years, they start to choose their own food and, in many instances, eat outside the home, opening them to new influences aside from their parents and caregivers. At this age, positive models of eating from parents, caregivers, siblings, educators and peers become more important and influential.⁴¹

Health professionals also play a major role in influencing parents through information, support, counselling and

care (see *Chapter 3*). With three quarters of all newborns delivered with the help of a skilled birth attendant, these providers have a significant impact on breastfeeding uptake and practices.

In many parts of Africa, Asia and Latin America, mothers-in-law and grandmothers are especially influential on how infants and young children are fed. However, their advice can often be inappropriate – insisting, for example, that colostrum is ‘dirty’ and urging mothers to hold off feeding animal-source foods until the child is 18 months of age.⁴² Grandmothers can negatively influence exclusive breastfeeding either through providing advice on early introduction of water and/or foods or actively feeding the infant themselves during the first six months.⁴³

BOX 2.1 | Responsive feeding

How a caregiver and child interact helps to shape long-term behaviours and attitudes toward food. Responsive feeding – the process of recognizing cues for hunger and fullness and responding to them appropriately – helps develop healthy eating habits beginning in infancy and limits child underweight and obesity.

Responsive feeding is grounded in several key principles for caregivers:

- Attend to the child’s signals of hunger and satiety
- Recognize and respond to the child’s feeding needs in a prompt, emotionally supportive and developmentally appropriate manner
- Ensure the availability of healthy food
- Create a safe and comfortable eating environment with few distractions.⁴⁶

Non-responsive feeding is characterized by a lack of reciprocity between the caregiver and child. It can reflect situations where the caregiver takes control and

dominates the feeding situation; where the child controls the situation; or where the caregiver ignores the child. When caregivers dominate feeding, they can not only override the child’s internal hunger and satiety cues, but also interfere with the child’s development of autonomy and independence.

According to a 2011 study, responsive feeding promotes a child’s acceptance of food and adequate intake.⁴⁷ Feeding infants and young children in response to hunger and satiety cues, instead of using food as a soothing strategy, can improve sleep behaviours, which can then help the child to be more physically active when awake and to better self-regulate their appetite.⁴⁸ A 2015 review concluded that responsive feeding interventions are the most promising obesity prevention measures for children under 2 years of age.⁴⁹ Lack of responsive feeding increases the risk of suboptimal growth and development in environments where undernutrition is prevalent. ■

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Finally, the modern food system exerts a significant influence on young children's diets. The retail sector determines the availability of and access to breastmilk substitutes, toddler drinks and other foods specifically targeted at young children, while advertising, packaging and placement of unhealthy snacks in supermarkets can make it difficult for parents and children to make healthy food choices.⁴⁴ The private sector can contribute in positive ways when it increases the availability, affordability and quality of complementary foods and supplements, distributing these products through channels such as retail markets, public health systems and social marketing, and generating demand for them among consumers (*see Special Section 'Influence of food marketing on children's diets', Chapter 4*).⁴⁵

Middle childhood: A time of transition (ages 5–9)

When children start going to primary school, lifelong dietary habits continue to be developed. A child's family, school and broader social forces all affect food availability and food choices, but children also start taking some responsibility for their own diets. This period of transition is important for establishing healthy eating habits. At this age, traditional gender roles and expectations begin to take hold for many children in low- and middle-income settings, with girls often helping out in the kitchen and caring for younger siblings, and boys assisting in income generation.⁵⁰

This period of childhood is marked by continued, steady growth. How much children eat during this phase

can vary widely. Appetites and food intake can increase before growth spurts and decrease during slower growth periods.⁵¹

Research also shows the potential for children to catch up during this age after early stunting. One study conducted in 2010 in Peru found that stunted children who caught up by the age of 6 years did as well in cognitive tests as non-stunted children.⁵²

Nutritional needs and patterns

Far too many school-age children around the world are eating too little fruits and vegetables and too many unhealthy snacks that are high in sugar, saturated fat, sodium and salt, for example in bread, cookies, sweets, ice cream and sweetened beverages that are often marketed to and popular among school-age children. Low consumption of fruits and vegetables is common – a worrying phenomenon given that children who eat fruits and vegetables in childhood are more likely to continue doing so into adulthood.⁵³ Many government departments of health recommend five portions of fruit and vegetables a day, but it is clear that many children are not getting anywhere close to these amounts. In a Brazilian study, for example, no children aged 7–8 years met the diet quality index for vegetables. Children in developing countries, especially in poorer households and rural areas, tend to have diets made up of a few staples such as cereals, roots or tubers with little protein.⁵⁴

Across higher and lower income countries and across food systems, there is a clear relationship between diet, cognitive development and academic achievement.⁵⁵



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Overweight and obesity in middle childhood has both short- and long-term effects

Hunger is an important factor. Energy is essential for concentration and participation in school activities, so children who have an empty stomach and feel hungry at school – from skipping breakfast or not eating enough – struggle to pay attention and complete tasks.

Hidden hunger also impairs school performance; certain micronutrient deficiencies affect learning. According to research, iron deficiency is linked with lower test scores.⁵⁶ Anaemia can cause fatigue and prevent children from paying attention in class. Eating an adequate diet regularly (in particular at breakfast) has been associated with higher academic achievement, while ultra-processed snacks and fast food may have negative associations.⁵⁷

The effects of **early malnutrition** have long-term consequences. The impacts of nutrient deficiencies in utero or in early childhood affect school performance: for example, stunting serves as a predictor of poor educational outcomes throughout childhood.⁵⁸

Reflecting the link between diet and school performance, some school-feeding programmes emphasize a diverse diet in foods that provide a range of nutrients. For example, Bhutan's school-feeding programme benefits around 45 per cent of the country's total student population. Micronutrient deficiencies are a major challenge – one in three adolescent girls in Bhutan is anaemic, and iron deficiency is thought to be a major cause. In 2017, a government analysis revealed that Bhutan's school menus were deficient in many micronutrients, particularly iron, B vitamins and zinc, and did not provide adequate dietary diversity. Recognizing

these challenges, several initiatives have been launched. Rice, the Bhutanese staple food, has been fortified and is now supplied to all schools. School menus are also reviewed to increase diversity and nutrition in meals.

School-age nutritional risks and concerns

Overweight (and obesity) in middle childhood has both short- and long-term effects. In the short term, it can raise cardiovascular risk factors, including type 2 diabetes, high blood pressure, high LDL cholesterol, and even atherosclerosis, and may also be linked to illnesses including asthma and low-grade systemic inflammation.⁵⁹ Through its impact on the immune and pulmonary systems, overweight and obesity raise the risk of infections,⁶⁰ an impact that may be particularly severe for hospitalized children.⁶¹ Childhood obesity is also linked to psychological and social problems, including low self-esteem, self-image and behavioural problems. Girls appear to be at greater risk, and the risk increases with age.⁶² In the long term, childhood overweight and obesity increase the risk of adult overweight five-fold⁶³ and is associated with a range of metabolic disorders in adulthood, including diabetes, stroke, high triglycerides, heart disease and hypertension.⁶⁴

Research has found that children in sub-Saharan Africa, especially in urban areas and among higher-income households, are sitting more and exercising less, which has implications for their health and nutrition.⁶⁵ In this, they are following the example of children in high-income countries, who now spend more than half their school day sitting in classrooms,⁶⁶ and are

spending more time sitting watching television or other screens at home.

Missing breakfast

Despite the clear evidence of its benefits, school-age children around the world commonly miss or skip breakfast, depriving them of a meal that particularly supports cognition, especially among undernourished children.⁶⁷ The reasons vary, but far too many children from poorer backgrounds have no choice – their families simply lack the resources or time to feed them in the morning. Many must rely on food provided or acquired at school instead. According to a WHO report, two-thirds of countries in Africa, the Americas and Southeast Asia provide school meals, but meal provision is less common in Europe and the Western Pacific.⁶⁸ For many children, therefore, the evening meal is the main meal, meaning they spend much of the day feeling hungry, which interferes with their attention in class and affects school performance, an effect recorded, for example, among children in Ghana and Uganda.⁶⁹

It may seem counter-intuitive, but in some settings, children who miss or skip breakfast have a higher BMI than their peers who do not. According to research conducted in New Zealand in 2007, this is because children who miss or skip breakfast subsequently eat more snacks – cookies, sweets, chips or crisps, and sweetened carbonated drinks that are high in calories but low in nutrients – between meals.⁷⁰

It is important to note that data on what school-age children eat are limited. In many studies, children

complete questionnaires at schools without the involvement of their parents, while younger children have trouble self-reporting their food intake – overestimation of food intake is common.⁷¹ Among older students, body image concerns can result in less accurate reporting, and under-reporting is likely especially among those who are overweight or perceive themselves to be overweight.⁷²

The school environment

In many countries, the school food environment promotes the consumption of unhealthy foods and overweight and obesity. Ultra-processed foods and sugar-sweetened beverages are often sold to children in school cafeterias or at convenience stores and street stalls outside schools.

Changing the food environment to provide healthier foods is not easy. For example, Mexico has taken action in recent years to reduce the availability of unhealthy foods in schools, but it continues to face challenges. In 2010, the government established food and beverage guidelines for elementary schools. However, in 2017, a study of 39 schools showed that energy-dense foods prohibited in the guidelines were still widely available, while vegetables, fruits, and plain water accounted for less than 7 per cent of the foods and drinks available in schools.⁷³ In addition, advertisements for sugar-sweetened beverages, pastries and sweets, many featuring gifts or special promotions, remain common outside schools, particularly state schools, and can influence food and drink choices among children.⁷⁴

In many countries, the school food environment promotes the consumption of unhealthy foods and overweight and obesity

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Adolescents are especially vulnerable to undernutrition, in part because their rapid physical growth and development during puberty raises their nutritional needs

Adolescence: Crucial years for lifelong nutrition (ages 10–19)

Adolescence is a time of rapid physical and psychosocial development and changes that accompany puberty. Boys have higher nutrient requirements due to a faster growth rate and greater gain in bone growth and muscle mass; girls are especially vulnerable to malnutrition, and gendered cultural norms mean they often lack access to nutritious food, education and economic opportunity.⁷⁵ Adolescent girls also have higher iron requirements than boys because of growth spurts and the onset of menstruation.

With an estimated 1.25 billion people aged between 10 and 19 in 2020, there will be 250 million more adolescents compared with just 30 years ago. Proper nutrition for this large cohort is important for both their current and future well-being. Yet around the world, adolescents routinely fail to consume diets that

would give them the foundation for long, healthy and productive adult lives. In rural areas, they often have limited food options and are susceptible to seasonal food shortages. In urban areas, they are surrounded by fast food and nutrient-poor snacks and drinks. In all settings, unhealthy snacks tend to be eaten. Hidden hunger affects tens of millions.

Adolescent dietary habits and risks

As with younger children, the diets of adolescents in low- and middle-income countries are generally nutritionally poor. Among school-going adolescents, 34 per cent consume fruit and 21 per cent vegetables less than once a day, but 42 per cent drink carbonated soft drinks at least once a day. Just under half (46 per cent) consume fast food at least once a week. Half of adolescent girls in low-income and rural settings in low- and middle-income countries eat fewer than three meals a day, with most missing or skipping breakfast. Snacking is common during school hours, and lunch is usually eaten outside the home.⁷⁶

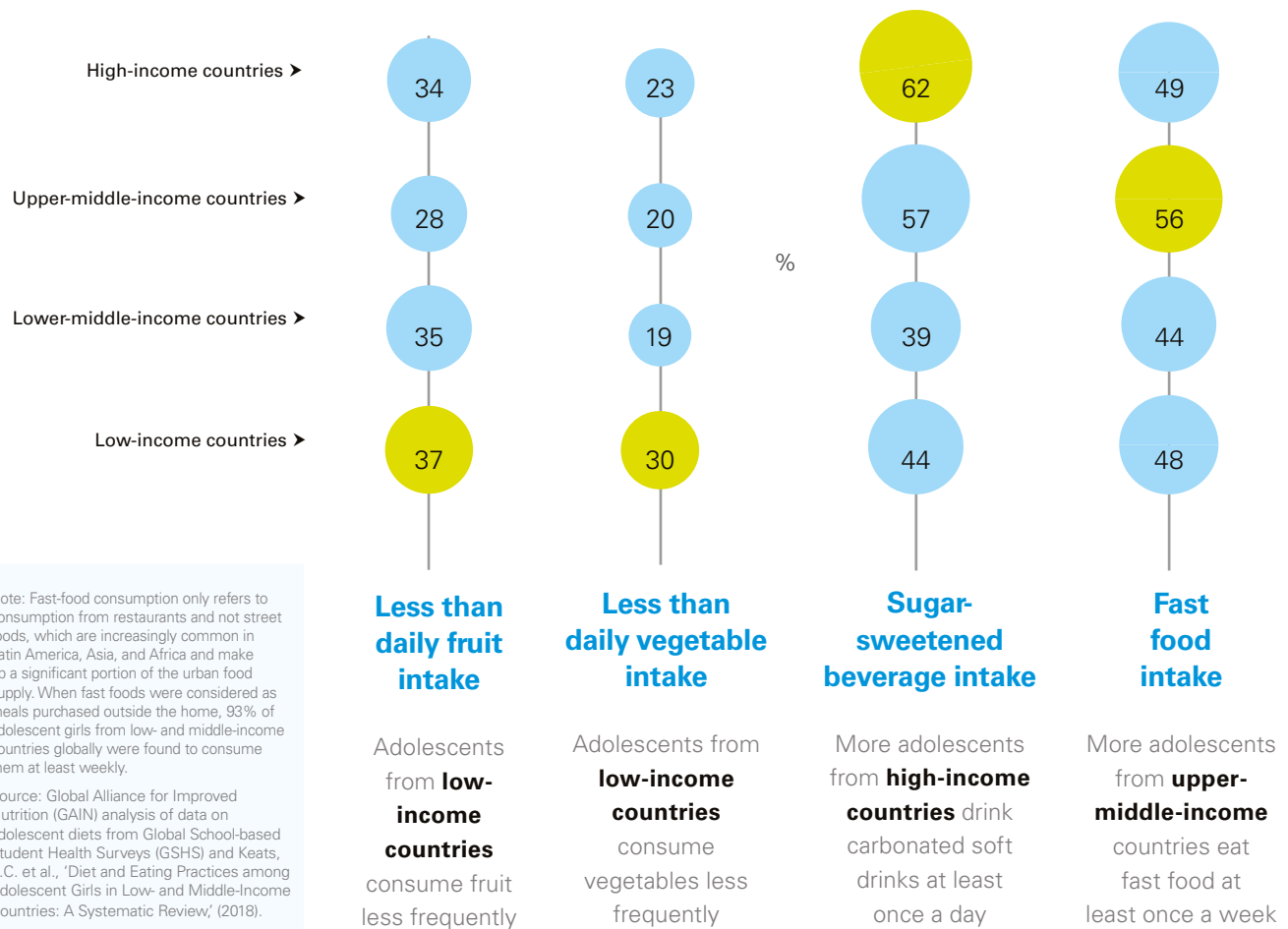
Padma, 17, chats with members of the Adolescent Girls' Club at Muttock Tea Estate, Dibrugarh district, Assam, India. The club raises local awareness about the risks of drinking salt tea.
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Adolescent dietary habits vary across country income groups

FIGURE 2.8 | Adolescent diets based on World Bank income group, 2008–2015



Nutrient deficiencies, overweight/obesity and pregnancy

Adolescents are especially vulnerable to undernutrition, in part because their rapid physical growth and development during puberty raises their nutritional needs. The absence of adequate nutrition risks undermining this crucial period of growth and development, an impact that is compounded for the 16 million girls between 15 and 19 years old and the 2.5 million girls under age 16 in developing countries who give birth each year.⁷⁷

Diet and nutrition play a key role in brain development right into adulthood. Undernutrition in adolescence is associated with impaired cognitive function, school absenteeism and psychological stress.⁷⁸ As Dr Neville Golden, a member of the American Academy of Pediatrics Committee on Nutrition and chief of adolescent medicine at Stanford University School of Medicine in California, has said, "If [teens] don't eat right, they can become irritable, depressed [and] develop problems such as obesity and eating disorders – and those have a whole host of psychological morbidities."⁷⁹

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While prevention of stunting in the first 1,000 days remains a priority, adolescence provides a second window of opportunity for high return on investment with nutritional interventions

There is evidence that sugar is particularly harmful for the adolescent brain, which is especially responsive to rewarding behaviours. The consumption of tasty foods high in sugar, salt and/or fat is hard to resist, but research in animal models indicates that individuals who drank sugar water during adolescence showed less motivation and pursued rewards as adults, behaviours that signify depression and other mood disorders.⁸⁰

Iron deficiency is a particular area of concern. To support their rapid growth and physical development, adolescents need sharp increases in the intake of certain vitamins and minerals, especially iron and especially for girls. Iron deficiency and iron deficiency anaemia are the leading causes of adolescent disability-adjusted life years (DALY) lost by girls aged 10–19 and boys ages 10–14 (one DALY can be thought of as one lost year of 'healthy' life). Despite improvements in South Asia, rates of iron deficiency and associated anaemia there remain the highest in the world, followed by sub-Saharan Africa.⁸¹

After iron deficiency, iodine deficiency is the second most common form of hidden hunger among adolescents. Global iodine status improved between 2003 and 2017, with the number of iodine-deficient countries decreasing from 54 to 19 and the number of countries with adequate iodine intake increasing from 67 to 111.⁸² Although the DALY rate has gone down across regions from 1990 to 2015, progress has slowed in recent years.

Overweight, obesity and associated NCDs are increasing among adolescents in most regions of the world.⁸³ While rising trends have plateaued in many

high-income countries, although at high levels, they have accelerated in parts of Asia. Losing weight is hard. A child who becomes obese during adolescence is likely to remain so into adulthood and to face higher risks of NCDs such as type 2 diabetes. There is some evidence that obesity in adolescence can have lifelong negative effects on the brain, contributing to early onset of cognitive dysfunction during ageing.⁸⁴

Pregnancy brings its own set of nutritional vulnerabilities. Each year, around 16 million adolescent girls aged 15–19 give birth. Most come from disadvantaged backgrounds and, as such, often have inadequate nutritional status before conception; as nutrient requirements increase during pregnancy, these risks are compounded.⁸⁵ Pregnant adolescents are at increased risk of malnutrition due to the competing growth and needs of the foetus.⁸⁶ Studies have shown that adolescent pregnancy carries a greater risk of complications and stunting of a girl's growth while also leading to a higher risk of health complications around the time of childbirth.⁸⁷ Negative consequences for offspring are much greater for early adolescent pregnancies (younger than age 16) than for late adolescent pregnancies (aged 16–24).⁸⁸

Catch-Up Growth

The rate of physical growth during adolescence is rapid, second only to that in early childhood.⁹¹ Healthy nutrition is vital in this period, and some evidence suggests that rapidly growing teens can even gain back some of the linear growth deficits suffered in early childhood, a phenomenon known as 'catch-up growth'. Typically, stunting prevalence decreases with age – that is,

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SPOTLIGHT

In search of healthy habits in Indonesia

It's 8am and the sun is already scorching the sports yards in front of a high school in Klaten District, Central Java, Indonesia. There's basketball practice on one side and tennis on the other, but not everyone is joining in. "I don't like doing sports outside, there's so much dust, and it's hot!" Zahfa giggles. Judging by the number of her classmates chatting in the shade, she's not alone.

For many of the students, this sports class is the only physical activity they do all week. Their school day is long and does not give them time to exercise. Nor does it encourage healthy eating habits – students arrive at 6.45am and classes continue, with a few rest breaks, until late afternoon, which partly explains why missing breakfast is so common.

According to a 2017 UNICEF study, around half of Indonesian teenagers miss or skip daily breakfast at home, so their first meal of the day is made up of whatever they can get at school.⁹⁹ There's typically no regulation on what can be sold in school canteens, so what's available is largely left to the discretion of the school or vendors. Typically,

the school curriculum also includes little about nutrition and healthy activities.

Factors such as these, as well as wider changes in diets (such as increased consumption of unhealthy foods) and industrialization have helped double rates of overweight in adolescents between 2004 and 2013. Indonesia has traditionally focused on reducing undernutrition, which remains a major problem – around 30 per cent of children under 5 have stunted growth.⁹⁰ Nevertheless, amid rising overweight, there's increasing awareness of the need to improve the knowledge, attitudes and behaviours of adolescents, their families and communities on healthy eating and physical activity.

That also means integrating nutrition and physical education messages into the school curriculum for students like Zahfa. "At home, I just watch TV," she says, "or I hang out with my friends, eating and chatting in the café." Although she does try to get to the gym once or twice a week, it's a challenge to fit it into her day. "School finishes at 4pm, so if I go to the gym, I don't get home until 6pm. It's tiring." ■

Zahfa at school in Klaten District, Central Java, Indonesia. © UNICEF/Indonesia/2018



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To a teenager, the future can seem too abstract and far away to worry about the long-term effects of what they eat

some children who were stunted early achieve normal stature by adulthood.⁹²

The potential for catch-up growth depends on many factors, including the severity of stunting experienced and the external environment during adolescence. Some evidence suggests that children who experience catch-up growth perform better on cognitive tests than their stunted peers who do not catch up.⁹³ Despite these promising findings, the physiological mechanisms underlying catch-up growth are complex, and measurement is difficult.⁹⁴ More evidence is needed on the extent to which physical and cognitive deficiencies can be eliminated.

While adolescence may provide an opportunity to catch up, gaining weight too rapidly in this period also poses

risks. Children who are undernourished usually reach puberty at a later age, as the body delays sexual maturation, allowing more time for growth.⁹⁵ Yet studies from Kenya and Senegal have found that when a stunted teen gains weight quickly, for example after moving from a rural area to a city or being adopted into an affluent environment, it triggers earlier puberty, so closing the 'window' for growth.⁹⁶

Good nutrition is critical to support the increased biological demands of adolescence. While prevention of stunting in the first 1,000 days remains a priority, adolescence provides a second window of opportunity for a high return on investment with nutritional interventions. For some children, catch-up growth means a second, and perhaps final, chance to overcome the deficits suffered in early life.

BOX 2.2 | Eating disorders, diet and adolescent mental health

Concern over body size and physical appearance, rapid bodily changes, societal pressure for thinness, dieting and peer pressure all make adolescence a time of increased vulnerability to eating disorders.

The risk of developing an eating disorder is influenced by both genetic and environmental factors. Eating disorders run in families, and over 50 per cent of liability of developing an eating disorder is due to genetic factors.⁹⁷ Societal pressures to be thin in girls, and to have low body fat and high muscularity in boys, can lead to behaviours that may be the first step in a slippery slope toward eating disorders.⁹⁸ Other mental health problems seen in adolescence such as depression, anxiety and low self-esteem are also associated with eating disorders.⁹⁹ Eating disorders are more common in girls, but in part this is because they may be under-detected in boys.¹⁰⁰ Healthcare professionals may fail to recognize the symptoms of eating disorders in boys because they assume they are female-only disorders.

In addition to eating disorders, both healthy diets and food availability play a role in adolescent mental health. According to a study in the United States, among mothers, past-year food insecurity – lacking access to enough food for a healthy, active lifestyle – increases the risk for childhood behavioural problems (aggressive behaviours, anxiety/depression, and inattention/hyperactivity).¹⁰¹ Mental health outcomes associated with food insecurity are not limited to childhood. Multiple US studies have reported an increased risk of past-year diagnoses of mood, anxiety and substance misuse disorders among adolescents reporting past-year food insecurity, independent of other aspects of socio-economic status.¹⁰² Indeed, these associations have been reported in other countries, continuing in college and through young adulthood, highlighting the global importance of having adequate, healthy food available across all phases of development for both physical and mental well-being.¹⁰³ ■

Adolescent food choices

To a teenager, the future can seem too abstract and far away to worry about the long-term nutritional and health effects of what they eat. Health and nutrition are simply not a major influence on the diets of many adolescents.¹⁰⁴ Instead, external factors, such as disposable income to spend on snacks and fast food, peer pressure and the social desire to fit in among friends, body image issues, and food marketing can all play a role in influencing what adolescents eat.

Casual work and pocket money from parents provides irregular income, particularly in middle- and high-income countries, and is often used to buy unhealthy snacks.¹⁰⁵ As one teen in Iran says, “Sometimes I decide to start eating healthy, but then in the morning I see my mom hasn’t prepared me a healthy snack and instead gives me money to buy snacks. Then it is natural that I go for buying things such as crisps and puffed cheese.”¹⁰⁶

Body image affects food choices as well. Depending on the local context, many adolescent boys want to gain weight and muscle mass, while many girls can be concerned about either excess weight or gaining weight as a sign of well-being and attractiveness. Eating disorders are not limited to high-income countries. Among young Tanzanian women aged 15–23, eating disorder symptoms increased with media exposure.¹⁰⁷

Marketing, packaging and aspirational status symbols have a seductive pull on all consumers, but adolescents are especially influenced by these factors. Fast food and prepared snacks

are widely available in urban areas worldwide and can be especially appealing to young people. Fast food restaurants, with their clean, bright interiors, are places where teens can hang out with friends.

For example, in Guatemala, the consumption of fast food and soft drinks is a sign of higher social status and upward mobility: “Being able to eat fast food was perceived as a sign that a family had middle- or upper-class status. Adolescents in ... rural areas ‘dreamt’ of eating fried chicken in fast food restaurants, and adolescents from poorer economic backgrounds looked forward to consuming soft drinks on special occasions ... They indicated that they purchased snacks because of the taste (‘it just tastes good’), notions about the food (‘it gives us energy’), and peer pressure and social acceptance (‘we all buy it’).”¹⁰⁸

Conclusion

Each stage of childhood produces specific nutritional needs, eating behaviours and influences on diet. But whether it’s not breastfeeding exclusively in the first few months, not eating a diverse diet in the early years, or consuming too much sugar, salt and fat during the adolescent years, children are not eating the diets they need in order to grow healthy, and this has lifelong consequences. The reasons why children are malnourished at different ages reflect a combination of drivers at the individual, family and broader societal levels. Widening our lens of analysis beyond each stage of childhood reveals the many causes of malnutrition. ■

The reasons why children are malnourished at different ages reflect a combination of drivers at the individual, family and broader societal levels

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SPECIAL SECTION

What is a healthy diet?

What should children eat? It's a simple question, but for many parents and caregivers, and even children themselves, the answer is not straightforward. The exact make-up of a healthy diet depends on each individual and local contexts, but the basic principle of a healthy diet is one that contains fruits and vegetables, whole grains, fibres, nuts and seeds, and during the complementary feeding phase, animal source foods. Healthy diets limit free sugars, sugary snacks and beverages, processed meats, saturated and industrially produced trans-fats and salt.¹⁰⁹

Ninety countries have developed food-based dietary guidelines, often based on recommendations from international organizations, into clear, understandable dietary advice that can also be visualized to aid communication.¹¹⁰ However, these guidelines are often not specific to the different phases of children's development and rely on recommendations that are not harmonized globally. Countries also struggle to provide clear guidance in the context of rapidly changing modern food environments, with ultra-processed, packaged foods taking up more of children's daily diet. Dietary recommendations can also become politicized, with food producers pushing back if government recommendations urge the public to eat less of their products. We have remarkably little data on dietary intakes and food consumption patterns over time, which also affect the design and updates of such guidelines.

Most national dietary guidelines advise eating a varied diet of four to five food groups:

- fruits and vegetables (up to half of daily diets in many cases)
- whole grains and starchy foods
- healthy, lean proteins and dairy foods
- limited intake of sugar, fat and salt.

Across all child age groups, energy intake should be in balance with energy expenditure to prevent overweight and obesity. While a common guideline of an adequate diet applies throughout childhood, there are specific recommendations for birth to age 2:

- Exclusive breastfeeding from the first hour of life until 6 months of age, and continued breastfeeding until age 2

- Nutritious and safe complementary (soft, semi-solid and solid) foods should be progressively introduced starting at 6 months, with a particular emphasis on a diverse range of iron-rich, nutrient-dense foods without added salt, sugar or fat, such as lean animal-source foods (including eggs, meat, fish and dairy), fruits and vegetables, and legumes, nuts and seeds.

Debates about public health nutrition in the media and among policymakers have often been influenced by controversies, fads and lobbying by business-interest groups, with arguments often based only loosely on the scientific evidence, or misinterpretation or over-simplifying of the evidence. This can result in a muddying of the evidence that undermines policymakers' confidence to take action. Controversies over conflicts of interest in nutrition research funding, especially when provided by the food industry, have added to the public's confusion over what makes up a healthy diet. For example, industry-funded research investigating the health impact of sugar-sweetened beverages is overwhelmingly and consistently more likely to reach 'weak/null' conclusions compared with independent studies.¹¹¹ A lack of conflict-free funding to implement evidenced-based dietary recommendations and nutritional interventions limits the broad impact of dietary guidelines. Past nutrition policy and programmes have often relied on 'knowledge' as the driver of behaviour change, assuming that better dietary choices will be made through education and dietary guidelines. Knowledge alone is not enough to improve dietary intake, however, and broader policy, behaviour change and environmental strategies are needed, especially given low investment by governments



Cooked rice, vegetables, meat and beans are portioned for children into small bowls at the 'Baby Café' in Pandas Village in Klaten District, Central Java Province. Parents and grandparents come to the Café each morning to buy food prepared by 'cadres' (volunteer community health workers). 'Cadres' help improve children's nutrition by providing information and counselling to their mothers. © UNICEF/UN04263/Estey

in public education and communications campaigns compared to the food industry's investment in marketing. Even if they have nutritional information, consumers may choose unhealthier but tastier, less expensive or more convenient foods that are marketed to them.¹¹²

In recent years, Brazil has provided some common-sense public recommendations based on what and how people actually eat on a daily basis. Researchers looked at the available data and saw that people were cooking less at home and eating more processed, packaged foods, leading to nutritional problems such as overweight, obesity and diet-related NCDs. According to the University of Sao Paulo's Carlos Monteiro, whose Center for Epidemiological Studies in Health and Nutrition helped develop the guidance, "the more people used the ready-to-consume products, the more problems they had with the diet ... people

who preserve that pattern of having freshly prepared dishes had the best diet. The good news is that these people are not the richest. They have lower income, many of them live in isolated places in Brazil." The recommendations provide guidance on what and how to eat (encouraging more cooking and eating with others at home) with one 'golden rule': always prefer natural or minimally processed foods and freshly made dishes and meals to ultra-processed foods.^{113, 114}

While our understanding of what makes up a healthy diet for children has advanced in recent years, gaps remain in defining the optimal intake for children at specific ages and for those living in different geographic regions and in different food environments. Unlocking further understanding through funding and research can put in place better evidence-based dietary recommendations and effective nutritional interventions at scale. ■

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PERSPECTIVE

Women lead the way in community-based child nutrition in rural Tanzania

Scholastica Nguli
 Founder,
 Rondo Women's
 Development
 Organization,
 Tanzania

In Africa, rural, remote villages are often synonymous with poverty and malnutrition, but this is not the case for the small village of Rondo in south-eastern Tanzania, where women have simply refused to watch their children die or suffer from stunting. Instead, they have been educating their communities to adopt a lifestyle of healthy eating. They walk up to 7 kilometres conducting door-to-door calls on families or to give talks at health centres where women usually congregate. These women are undertaking these life-changing activities in addition to their demanding daily chores such as tilling the land, fetching firewood, preparing food for their families and taking care of their children.

Because a lack of awareness of breastfeeding is one of the factors behind the burden of child malnutrition in the Rondo area, Rondo Women's Development Organization (ROWODO) decided to spread their knowledge to healthcare facilities through household visits and public meetings to ensure that nutrition is placed high on the agenda – and ultimately to end hunger, achieve food security, improve nutrition and promote sustainable agriculture.

ROWODO faces a range of challenges that impair efforts to stop malnutrition. The

first is cultural beliefs. Most communities in Rondo restrict breastfeeding soon after their child is born, throwing out breastmilk because they believe it is dangerous to their babies' intake of important vitamins from their mother's first milk after birth.

Another challenge is the lack of gender equality. Since most of the men do not participate in domestic duties, mothers have a heavy workload, for example going to the well to fetch water, going to the forest to find firewood, preparing food for the family and cleaning the household. Because these mothers are so busy, child feeding is negatively affected.

There is also a problem of giving children food other than breastmilk before the age of 6 months. When a child cries repeatedly, many women believe they are crying because of hunger and that they are not satisfied with breastmilk. They start to give them porridge made from cassava flour, which is not suitable. Many families also go to traditional healers when their child is suffering instead of the hospital. This exacerbates malnutrition and the increasing incidence of deaths among children aged under 5 years.

Scholastica Nguli, the founder of the Rondo Women's Development Organization (ROWODO), has worked since 2011 to reduce child deaths caused by malnutrition in the Rondo area of Lindi region, Tanzania. ROWODO is a member of the Partnership for Nutrition in Tanzania (PANITA), a collection of 300 civil society organizations.

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To fight malnutrition in Rondo ward, ROWODO:

- educates mothers, either one-on-one by visiting families or by hosting talks at maternal clinics, on the importance of exclusive breastfeeding after giving birth, at least until the baby is up to 6 months old
- teaches parents about the dangers of feeding babies under six months old foods other than their mother's milk
- provides information on the importance of feeding infants up to 2 years old with nutrient-rich food, such as cassava, lentils, beans and grains such as ulezi (millet) that are grown locally
- breaks old myths, for example one that says a pregnant woman should not eat eggs.

The women of Rondo have become the epitome of taking action at a time when most of society waits for government to fight malnutrition alone. Often, communities see malnutrition as too big a problem and feel that there is nothing they can do to change it. Yet the action by the women in Rondo demonstrates that there are solutions within the reach of communities to end malnutrition.

All interventions count, whether it is breastfeeding, washing hands before eating, keeping a clean environment, or drinking clean, safe water. There is no one specific approach that communities must adopt to help them accomplish significant change. The example of Rondo shows that collective action has a significant effect on bringing malnutrition in a community to an end. ■

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03 MALNUTRITION IN A CHANGING WORLD

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Globalization, urbanization, climate shocks and emergencies are worsening the nutritional prospects of millions of poor and excluded children. For many, lack of access to nutritious, safe, affordable and sustainable food is compounded by the threat of disease from poor water and sanitation. We need a nutrition transformation to ensure these children get the chance to fulfil their potential and to help end the flow of poverty across generations.



- Globalization has changed everything from crop harvesting to supermarket food displays. 77% of processed food sales worldwide are controlled by just 100 large firms.



- By 2050, 70% of the world's adolescents will live in cities, more exposed to the marketing of unhealthy foods and more vulnerable to diet-related diseases.



- Without action, future generations will likely face increased food insecurity and malnutrition brought on by climate change.

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Because of poverty and exclusion, the greatest risk of all forms of malnutrition is shouldered by the most disadvantaged children

Introduction

Across urban and rural contexts, poor-quality diets threaten the survival, physical growth, brain development and life potential of poor and excluded children, setting them up to pass disadvantage down to the next generation. Even in an ever-changing world, this is as – if not more – accurate today as it was decades ago.

The world has undeniably changed. A growing body of evidence about nutrition – on the importance of maternal nutrition before and during pregnancy, on exclusive breastfeeding and diverse first foods, and on good care and hygiene practices in early childhood – is providing crucial insights to pave the way for good nutrition from the first 1,000 days into middle childhood, adolescence and adulthood and on to new generations.

Globalization, unplanned urbanization and climate shocks are also driving dietary changes, both positive and negative, and these changes are shaping families' food options and choices. Those who can afford it may have greater access to diverse and nutritious food, but for far too many, these benefits remain out of reach. Because of poverty and exclusion, the greatest risk of all forms of malnutrition, and, consequently, the heaviest non-communicable disease (NCD) risk burden is shouldered by the most disadvantaged children.

Emerging science

Nutritious food is necessary to ensure children grow well, but it's not sufficient. Around the world, diarrhoeal and other diseases undermine the

nutrition of tens of millions of children, as do less well understood conditions such as chronic inflammations of the gut. Increasing evidence shows that poor diets are harming children's gut flora, raising their risk of infection, and that intergenerational cycles of malnutrition can also be the outcome of both maternal underweight and overweight.

Greater knowledge in areas such as hygiene and sanitation, the microbiome and epigenetics has the potential to prevent disease and poor nutritional outcomes from the first 1,000 days into adulthood.

Hygiene and sanitation

Malnutrition underlies 45 per cent of deaths in children under 5 years of age. Diarrhoea is particularly deadly when children are undernourished, killing over 700 children under 5 every day in 2016.¹ Most childhood cases can be traced back to unsafe drinking water, foods contaminated in the home, or faecal contamination from poultry and livestock. Improper sanitation helps spread infectious diseases and intestinal worms and encourages the development of conditions such as environmental enteric dysfunction.

Our understanding of the role of hygiene and sanitation in malnutrition is evolving. For example, recent research suggests that much higher levels of hygiene and sanitation are needed to safeguard children from stunting than was previously thought: "Conventional thinking is that improving access to food and educating families about hygiene will prevent childhood malnutrition, but these interventions keep failing," according to the lead author of a study

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BOX 3.1 | Conceptual Framework of the Determinants of Maternal and Child Nutrition

When children and women eat well, everyone benefits. Children provided with a nutritious, safe and diverse diet are equipped for the physical and cognitive development, school performance and healthy life that awaits them.

For children to eat well at each stage of growth, not only must food be of good quality and consistently available, accessible and affordable, but several other factors must be in place. Their families need resources. These include money, but also knowledge of how to access and provide a healthy diet. They need support in the face of financial stress and time pressure. They need access

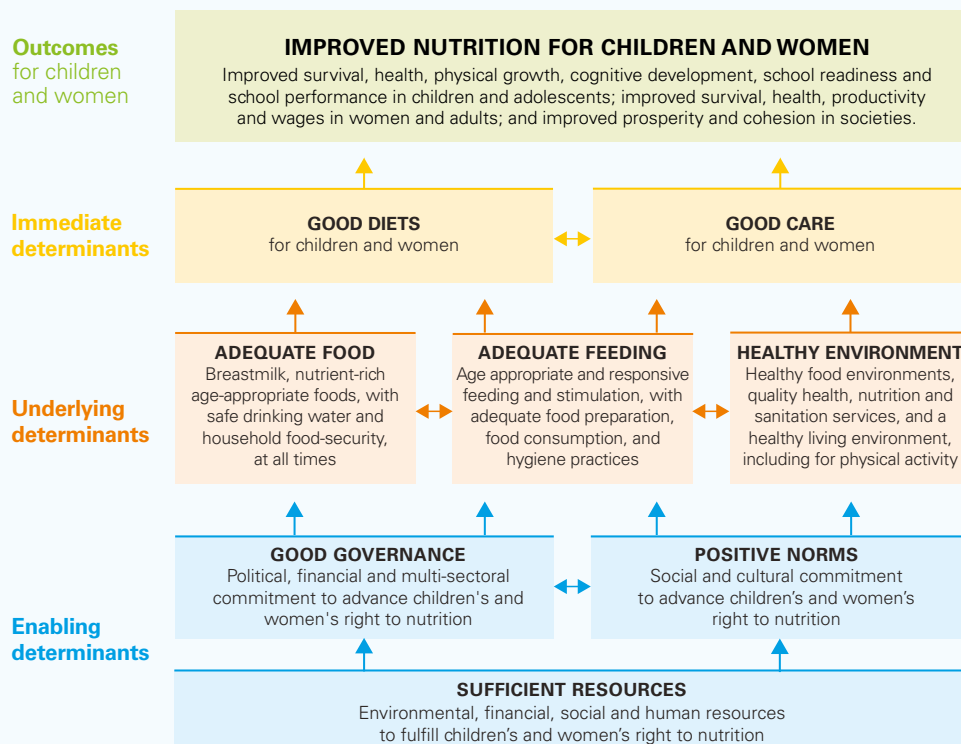
to quality health services and a healthy environment, free of disease and unsanitary conditions.

Children's diets are also determined by broader forces at play, such as political commitment, economic priorities and social norms.

To better understand and address these complex and far-reaching challenges, UNICEF has developed the 2020 Conceptual Framework of the Determinants of Maternal and Child Nutrition. It builds on UNICEF's 1990 framework on the causes of child undernutrition, acknowledges the evolving and multiple nature of maternal and child malnutrition, and

incorporates new knowledge on the drivers of malnutrition.

The Conceptual Framework uses a positive narrative about what contributes to improving maternal and child nutrition and preventing malnutrition in all its forms in children, adolescents and women. It provides conceptual clarity about the enabling, underlying and immediate determinants of maternal and child nutrition, and about the outcomes resulting from improved nutrition in children, adolescents and women (*see below*). The Framework guides UNICEF's 2020–2030 Global Strategy for Maternal and Child Nutrition. ■



Children's diets are also determined by political commitment, economic priorities and social norms

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Children washing their hands in a refugee camp in Betou, Republic of the Congo. © UNICEF/UN0327817/Diefaga

in rural Gambia.⁷ “There’s a very high threshold of hygiene necessary to allow children to grow properly – communities need improved living conditions and access to clean water piped into their homes. These findings should redirect governments’ priorities, shifting efforts to providing drastically better housing, and better access to clean water.”⁸

Food safety

Contamination of food – whether from the environment or from microorganisms – has dire implications for children’s health. Infants and children are especially vulnerable to such threats because their metabolic system is still developing and key organ maturation is susceptible to permanent and lifelong disruption.⁹

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BOX 3.2 | Environmental enteric dysfunction

The deleterious effects of acute diarrhoea on health are well known, yet in otherwise healthy populations, and those in which interventions have reduced diarrhoea, many children still do not achieve normal growth.² The exact cause of this growth failure is unknown, but there's increasing interest in the possible role of environmental enteric dysfunction (EED).

EED is a subclinical disorder where chronic exposure to faecal pathogens inflames and damages the intestines, reducing the body's ability to absorb nutrients. It is strongly associated with stunting and iron deficiency.³ The condition

is highly prevalent among people living in conditions of poverty.⁴ Biomarkers for EED are found in children living in unsanitary household environments and are associated with high levels of stunting.⁵

EED may also play a role in poor cognitive development and educational achievement among children. A longitudinal study in eight low- and middle-income countries found an association between a higher number of enteric infections and poorer cognitive scores at 2 years of age, independent of diarrhoea.⁶ ■

The best preventative measure for infants, who are especially vulnerable to foodborne and waterborne disease, is breastfeeding.

Parasites, viruses and bacteria – such as *Salmonella* and *E. coli* – naturally inhabit the surfaces of raw food and can cause serious illness. Without good hygiene practices such as regular handwashing with soap, the improper handling of food in preparation or storage can result in foodborne illness.

The impacts of contamination via water, air or soil and exposure to antibiotics and pesticides have been well documented in recent years and, in high-income countries in particular, have resulted in a demand for organic and pesticide-free foods. Researchers and the scientific community are also examining the effects of exposure to food additives and substances in contact with foods in its packaging, for example, plastics.

The microbiome

Often called the body's 'second brain', the gut microbiota has been

the subject of growing research and attention in recent years. Its powerful effects on physical and mental health are becoming increasingly clear, as is its role in enhancing immune system functions.

Our bodies are home to trillions of microbes that play an instrumental role in nutrition and healthy growth. These tiny intestinal guests not only metabolize the food we eat and affect our weight and cognitive development,¹¹ but also strengthen our immune systems. They even predict our vulnerability to developing diseases, including obesity.¹²

By the age of 3, children have established most of their microbiome for life.¹³ Whether the microbiome begins to develop during pregnancy or childbirth is still a matter of debate, but the first hours, days and years of life are critical. In childbirth, microbes from the birth canal and vagina are passed to the baby, inducing an important immune response. Breastfeeding and skin-to-skin contact starting in the first hour help create a healthy microbiome. Breastmilk contains proteins, human

Contamination of food has dire implications for children's health



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Microbes tell the body whether it needs a particular type of food, through what's known as the 'gut-brain axis'

milk oligosaccharides and probiotics that improve health and brain development. Breastmilk has been called “probably the most specific personalised medicine that the child is likely to receive, given at a time when gene expression is being fine-tuned for life.”¹⁴

Threats to this development include: exposure to antibiotics (in utero or in early life), birth by caesarean section, formula feeding and lack of diversified first foods. These disrupt microbiome establishment and can adversely affect nutrition and health,¹⁵ for example by increasing a child's vulnerability to allergies and asthma.¹⁶

Adding diversified first foods to an infant's diet after the first six months of life adds bacterial variety that helps digest fibre, starch and proteins. A more diverse diet helps the microbiome perform a greater set of metabolic tasks. Adequate, largely plant-based diets high in fibres and proteins create healthy microbiomes.

By the same token, eating processed foods that are high in sugar, salt, fat and additives affects the microbiome

in ways that can encourage obesity, diabetes and inflammatory bowel disease.¹⁷ For example, some additives in foods such as mayonnaise and ice cream break down the protective barrier of mucus in the gut that separate microbes from the intestinal lining and produce proteins that inflame the gut.¹⁸

The gut microbiome also influences our food choices. Research shows that microbes communicate with the brain, telling the body whether it needs a particular type of food, through what's known as the 'gut-brain axis'. This might start even in breastfeeding, when the infant's needs are communicated to the mother via contact between saliva and the nipple in a feedback loop.¹⁹

There is still much to learn about the microbiome's role and development during the early years. For example, little is known about the gut microbiota of children in the first two years of life in low- and middle-income countries. More research is needed also on links between mothers' microbiomes during pregnancy and childbirth and infant stunting.²⁰

BOX 3.3 | Additives

In the United States, an estimated 10,000 chemicals are allowed in food and its packaging, yet considerable knowledge gaps exist on the safety of these chemicals. The American Academy of Pediatrics (AAP) released a policy statement in 2018 asking for reforms to how food additives are regulated. It highlighted concerns over bisphenol A (BPA), phthalates, perfluoroalkyl substances, perchlorate, artificial food colours and nitrates/nitrites, given their links to endocrine disruption, attention-deficit hyperactivity disorder

(ADHD), and chronic conditions such as cancer, type 2 diabetes and obesity.

In addition to better testing, closing data gaps and labelling additives, the AAP also recommend reducing exposure by eating more fresh or frozen fruits and vegetables, avoiding processed meats, handwashing with soap before handling food, washing fruits and vegetables, and avoiding putting plastic in a microwave or dishwasher.¹⁰ ■

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BOX 3.4 | Epigenetics

Epigenetics is the study of changes in organisms brought about by modifications in gene expression. It is a change in phenotype (observable physical and biochemical traits) without a change to genotype (the inherited genetic composition of a cell, i.e. DNA). In other words, a person's environment or lifestyle can change which genes in their DNA sequence are expressed or not expressed, and that change can be passed down to their children.

For example, maternal micronutrient deficiencies can alter foetal metabolism and organ development, resulting

in epigenetic changes in the child. This epigenetic adaptation puts children at increased risk of childhood overweight or obesity, and chronic diseases in adulthood, including obesity, coronary heart disease, stroke and type 2 diabetes.²²

How does this happen? Put simply, the baby of an undernourished mother 'expects' a low-nutrient world. However, fed a diet high in calories (and low in nutrients), the child becomes predisposed to some forms of disease.²³ ■

Intergenerational cycles of malnutrition

A mother's health and nutritional status is key to determining that of her child (*see Chapter 2*). Both maternal undernutrition and maternal overweight affect children's development, including that of their metabolism, "fueling an intergenerational cycle of malnutrition."²¹ Much more research is needed on the complex impacts of maternal – and paternal – nutrition on children, especially in emerging areas such as epigenetics.

Amid growing global rates of obesity, increasing attention is being paid to the negative effects of maternal overweight and diabetes on health and nutrition outcomes for the mother herself and for her child and future generations.²⁴ Today, maternal overweight²⁵ is the most common risk factor of pregnancy.²⁶

The association between maternal overweight and a child's risk of metabolic disease is remarkably strong across the life course. Studies from around the world

have shown an association between maternal overweight and overweight in the next generation at the ages of 21, 32 and even – according to the Helsinki Birth Cohort Study – 62. That same study also found links between maternal overweight and children's physical and psychosocial functioning in late adulthood.^{27, 28}

At the same time, examples of rapid improvements in tackling undernutrition – from Japan, South Korea and more recently Brazil²⁹ and Peru³⁰ – show that nutritional status can dramatically improve even within a single generation. A 2013 study of children in their first two years from Brazil, Ghana, India, Norway, Oman and the United States also concluded that, with adequate care and nutrition, children of parents who experienced adverse nutritional conditions can still attain optimum height.³¹ To ensure that happens, women and girls – and especially adolescent mothers – need support and guidance on nutrition before pregnancy, for their own well-being and so as not to miss the window of opportunity of the first 1,000 days.

Both maternal undernutrition and overweight fuel the intergenerational cycle of malnutrition

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SPECIAL SECTION

Girls and women need stronger support for better nutrition

As primary caregivers, women play a pivotal – if not the most crucial – role in whether children are eating well, yet far too many women are excluded from decision-making. They face early marriage and early pregnancy as girls, intrahousehold discrimination and domestic violence, restrictions to their education and employment opportunities, and gender-biased laws that limit their access to land and financing. What is more, far too many girls and women struggle with malnutrition themselves.

Poor diets are amplifying gender imbalances by reducing learning potential, increasing reproductive and maternal health risks and lowering productivity. These impacts are perpetuating inter-generational cycles of malnutrition and inequity: the children of malnourished mothers are more likely to suffer stunting, cognitive impairments, weakened immunity and a higher risk of disease and death.

Adolescent girls are especially vulnerable to malnutrition because they are experiencing their fastest physical growth since the first years of life. With menstruation, their bodies require more iron. Adolescent pregnancy – a major contributor to maternal and child mortality – presents particular risks because girls' bodies have not finished growing and the foetus might compete for nutrients.

Women are more vulnerable to micronutrient deficiencies, particularly iron deficiency anaemia. This unmet nutritional need for iron is linked to the greater likelihood of being poor, and lacking power and access to resources. Malnourished mothers confront major risks. These include a compromised immune system, greater risk of dying in childbirth, lower productivity and capacity to generate income, and greater difficulty in caring for their families.

When girls and women are denied the right to food, nutrition and health, children, households, communities and economies suffer. Conversely, when they are empowered to achieve higher levels of education, control more income, bring assets home and to make decisions, nutrition improves and everyone benefits, setting a virtual cycle in motion.

Women face a disproportionate work burden. While more likely than men to work as unpaid family labourers or in the informal sector, they also make up nearly 40 per cent of the world's formal labour force.¹¹⁵ Yet, almost everywhere, mothers remain responsible for most child feeding and care.

As mothers increasingly take on new roles – as entrepreneurs, academics and community leaders, for example – many grapple with time poverty. The time and energy demands of multiple roles can make for a stressful, if not impossible, challenge to feed their children, and themselves, well. Without the support of their partner or family network – and without access to affordable, healthy foods – they may rely on the convenience of processed foods or fast foods.

Along the same lines, without the right workplace practices or national policies in place, mothers



Chantal, a tea plucker on the Rutsiro Tea Plantation in Rwanda, has four children. Before the plantation's early childhood development centre was built, Chantal would carry her daughter, Umuhoza, now 3, on her back all day when she worked. "It was very uncomfortable to pluck tea while carrying our children. We were also very unproductive because we had to stop and breastfeed and care for our children. We knew we were not giving them the best opportunities, but we had no choice. After the centre was built, we had more time. Our children are now doing well and we are more productive." In 2017, UNICEF Rwanda partnered with the National Agricultural Export Development Board to help tea plantations and factories be more family-friendly work environments. This includes advocating for paid maternity leave and breastfeeding breaks, flexible working hours for new parents and affordable child care options. © UNICEF/UN0308986/Rudakubana

might not be able to exclusively breastfeed or continue breastfeeding. Despite three ILO Conventions on Maternity Protection – the first was 100 years ago – most countries have made only slow progress in adopting policies to support breastfeeding.

To address this requires raising women's social status, autonomy and decision-making power. It requires enabling girls to stay in school longer to achieve better livelihoods and independence. It also requires investing in adolescent girls' and women's nutrition and health, with a particular focus on the pre-pregnancy, pregnancy and lactation periods.

To make the right nutrition decisions, women and mothers need adequate information, counselling, support and access to nutritious, safe, affordable and sustainable foods. They need maternity protection policies so that workplaces support exclusive and continued breastfeeding, and enough paid parental leave. A recent study recommends a minimum of six months' paid leave to ensure the best outcomes for mothers and children (this aligns with the WHO recommended duration for exclusive breastfeeding).¹¹⁶ Gender-equitable parental leave policies that encourage fathers to use leave are also associated with reduced family stress, more involved parenting and more stable relationships. ■

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77 per cent of processed food sales worldwide are controlled by just 100 large firms

Globalization

Globalization – the flow of goods, technologies, information, capital and more across country borders – has overtaken food systems. It has changed everything from the harvesting of crops to the way food is displayed in a supermarket to what children eat.

On the one hand, families who can afford it have access to a greater availability and diversity of food – quinoa, kimchi or year-round strawberries. On the other hand, with the expansion of ultra-processed and fast foods and the impact of marketing, multinational and transnational corporations are making it increasingly hard for children to eat well.

The rise of supermarkets, convenience stores and fast-food chains around the world reflects changes in both consumer demand and the supply of low-nutrient foods to consumers, including children and their caregivers. A quarter of a century ago, food supplies tended to be under the control of national governments, which focused heavily

on food security. However, from the mid-1990s, food was included in world trade agreements. The result is that food systems are now exposed to business forces that have changed the availability, price and marketing of foods.

While there are millions of farmers, food producers and consumers, there are only a few large processors and marketers: 77 per cent of processed food sales worldwide are controlled by just 100 large firms.³²

As the High Level Panel of Experts on Food Security and Nutrition points out in its 2017 report, “The progressive concentration of much of the economic power in the hands of transnational food corporations over the past decades has limited the domestic policy space and political power of local and national governments. In turn, this has reduced governments’ ability to protect and promote the right to adequate food of their people.”³³ The same report highlights that “those most impacted by inequitable, dysfunctional food systems and unhealthy food environments include

BOX 3.5 | Ultra-processed foods

Processing of food is not in and of itself undesirable. Many popular, traditional and nutritious foods are ‘processed’ – think of drying wheat or fruit or making yoghurt. However, not all food processing is the same, and nutrition specialists typically make a distinction between ‘processed’ and ‘ultra-processed’ foods. The latter have been defined as “industrial formulations”³⁶ containing little or no whole foods, but rather substances extracted from whole foods, for example “hydrogenated oils and fats, flours and starches, variants of sugar, and cheap parts or remnants of animal foods usually with little nutritional value compared to the original whole food.”³⁷ These foods

are energy dense, high in fat, sugar and sodium, and low in fibre and micronutrients – think of burgers, nuggets, cookies and sugary drinks.

Avoiding ultra-processed foods is not easy; nor are they designed for moderate consumption. Thanks to their high levels of fat, sugar, salt and other flavours, many ultra-processed foods taste delicious and feel satisfying in the mouth. Also, taking into account their heavy marketing – often aimed at children (see Chapter 4) – and wide availability, it is easy to see why such ultra-processed items displace fresh or minimally processed foods. ■

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low-income consumers, the rural and urban poor, smallholder and subsistence farmers and indigenous peoples.”³⁴

On the demand side, economic and climate forces are moving people to urban areas where lifestyle, socio-cultural pressures and marketing are changing diets (see ‘Urbanization’ below). The increasing availability and growing market share of ultra-processed foods, for example, presents a tremendous loss for traditional food markets, small-scale farmers and rural populations who can’t compete with the big businesses or supermarket chains. In some cases, this is pushing rural families to move to urban areas in search of better livelihoods.

For some children, this means greater access to education, healthcare services

and diverse foods. For others, urban life means dietary threats (greater exposure to fats, sugars, salt, etc.), sedentarism, environmental pollution and unsanitary or overcrowded living conditions.

Ultra-processed foods are at the heart of the globalization of food markets. As markets in high-income countries have matured, global or transnational food and beverage businesses have increasingly sought out new markets in low- and middle-income countries, including sub-Saharan Africa, which represents an “amazing opportunity”, as the head of one fast-food business has said.³⁵

Many of these businesses focus on ultra-processed food items because their low production cost, long shelf-life and high retail value make them highly profitable.

A street lined with market stalls in Freetown, Sierra Leone.
© UNICEF/UN072187/Phelps



The lack of public spaces drives adolescents to meet at fast-food chains instead

As a result, such foods are now almost ubiquitous, and found even in remote areas of Ethiopia and Nepal, where a choice of vegetables, fruits and fish is not.³⁸

Some experts have argued that because the distribution chains of transnational food companies now reach so far into rural areas, urbanization is no longer the main factor in determining whether or not people, including children, have access to unhealthy foods.³⁹

A recent global analysis of trends in mean body mass index (BMI) segregated by rural and urban areas from 1985 to 2017 found that in low- and middle-income regions (and with the exception of women in sub-Saharan Africa), adult BMI is increasing at the same rate or faster in rural areas than in cities. The authors cite the possible reasons as less energy spent on daily work and domestic chores, and, with increased incomes and a widening availability of food products high in fat, salt or sugar, increased consumption of low-quality calories⁴⁰ – in short, what has been called “the urbanization of rural life.”⁴¹

Urbanization

Since the mid-20th century, the share of the world’s population living in cities has risen from 30 per cent to more than half. Urban dwelling is only set to grow, significantly affecting children and young people. In 2009, around half the world’s adolescents lived in cities; by 2050, that proportion is forecast to rise to 70 per cent.⁴²

A common narrative is that dietary changes are happening first in urban areas, as are the consequent nutritional outcomes and increase in NCDs.⁴³ One

reason for this is the change in lifestyle and environment. Compared to those in rural areas, urban residents rely less on starchy carbohydrates and tend to consume more meat and other proteins, more fruits and vegetables (among richer households), more food outside the home, and more ultra-processed foods.⁴⁴ The result is a higher prevalence of overweight and obesity among city dwellers. From Sri Lanka to India, from China to Benin, urbanization is also associated with high rates of diabetes, hypertension and cardiovascular disease.⁴⁵

City life accounts for some of these trends: more sedentary jobs, less time and energy spent on domestic chores and greater use of public transport to get around, which can mean reduced physical activity.

For children living in cities, spaces for outdoor play might be hard to find or unsafe. This is important because children who get more exercise are less likely to be obese,⁴⁶ not only because exercise burns calories, but also because it changes how the body processes glucose and also likely benefits mental health and helps combat depression. The lack of public spaces for children to play or for adolescents to convene also drives them to meet at fast-food chains instead.

Buying food

Families living in cities typically buy their food, so income is a key factor in what they eat. They are more likely to buy their food from large retailers, such as supermarkets, and much of it is packaged and processed or ultra-processed.⁴⁷ Research from Kenya shows that people shopping in supermarkets buy fewer unprocessed staples (fresh fruits and vegetables, etc.) and more processed

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SPOTLIGHT

Child nutrition in poor urban areas of Kuala Lumpur

In the low-cost flats of Kuala Lumpur, Rohana, Noor and Siti Fatimah are three mothers with a common struggle: providing their children with a nutritious diet. During a focus group discussion held for the SOWC report, they shared their main challenges.

Malaysia bears a significant double burden of malnutrition: while 20.7 per cent of children under five suffer from stunting and 11.5 per cent from wasting, 12.7 per cent of children (5–19-year-olds) are obese.¹¹⁸ This reality is more complex in poor urban areas, where malnutrition rates tend to be higher than the national average.¹¹⁹

Affordability is a common problem. While all three mothers understand the importance of eating nutritious food, cost constraints determine what they can feed their children, regardless of its nutritional value. The cheapest and most typical meal consists of fried eggs, rice and soy sauce. Noor, mother of four explained, “I do not think about that thing [healthy and balanced food]. Others are eating fish, but I am able to provide only rice. I know it’s not good, but that’s all I can provide.”

Poor-quality diets are both physically damaging and psychologically distressing. One mother said that she might only have the chance to serve chicken once a

year. Another mother acknowledged that eggs are easy to obtain, but one of her children is allergic to them, so she is obliged to find alternatives. A third mother received a report that her child attempted self-harm because the child was not able to eat at a famous fast-food chain.

Meal frequency is also a major concern. Sometimes, they must purchase their groceries on credit at the nearby shop. Noor and Siti Fatimah explained that they ration the food among their children throughout the day. Otherwise, they will finish the food too quickly.

Balancing work and household activities is also an important issue. While two of the three mothers were able to achieve flexible working arrangements with their employers, Noor has to take her infant with her to work. This slows her down and impedes her work performance, ultimately affecting her income.

All three mothers expressed a strong desire to escape poverty. To develop her business, Rohana explained, she would benefit from policies that provide support to single mothers. Noor and Siti Fatimah agreed. With access to start-up capital, they too would like to open a business of their own. ■

Siti Fatimah peels boiled eggs to put in curry at her home in Desa Rejang, Setapak, Kuala Lumpur. © UNICEF/Zahri 2019



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Television commercials for snacks and sugary drinks target children

and ultra-processed food items.⁴⁸ This is also seen in Thailand, where supermarket shopping is associated with consumption of soft drinks, snack foods, processed meats and instant foods.⁴⁹

Children and caregivers in cities also experience more exposure to the marketing of processed foods, which can influence food choices.⁵⁰ Such marketing is seen in public city spaces – including near schools – and in television commercials for snacks and sugary drinks, for example, that target children.

For the urban poor, such as those living in slums, eating well proves even more challenging as access to nutritious foods narrows. Many rely heavily on street food, which is often high in fat and salt. Street food accounts for about a quarter of household food spending in low- and middle-income countries.⁵¹ Food-insecure households in urban areas of Malawi, for instance, were more likely to consume processed foods from street vendors. One study concluded that “Food insecure urban residents may be especially vulnerable to poor health outcomes associated with both poor access to nutrient-dense foods and diets high in refined and processed foods.”⁵²

Cities are taking action to address these challenges. As of July 2019, 198 cities around the world signed the Milan Urban Food Policy Pact with the aim to “develop sustainable food systems that are inclusive, resilient, safe and diverse, that provide healthy and affordable food to all people”.⁵³ The NOURISHING Framework also brings together policy action across food environments, food systems and behaviour change. From Curitiba,⁵⁴ Amsterdam, Daegu and Dakar to London,⁵⁵ city-level action includes improving access to healthy foods for

poor households, introducing school-based advocacy and learning, urban farming, and enforcing restrictions on the marketing of unhealthy foods.

Access to healthy food

Not everyone has access to healthy foods. For families in rural and remote areas, or areas with poor infrastructure, limited physical access to healthy food outlets can be compounded by issues around access to farmland as well as climate and seasonal fluctuations, which can threaten food security and diet diversity.⁵⁶

In our increasingly urbanized world, families in cities also face major challenges in finding healthy foods. Many live in ‘food deserts’ – mostly urban neighbourhoods where residents have little or no access to healthy food markets.⁵⁷ In these communities, people may buy food from fast-food outlets and unexpected places such as petrol (gas) stations, barber shops, gyms, discount stores, hardware stores, local general shops and laundromats.⁵⁸ The abundance of high-calorie, low-nutrient, processed foods in these areas has also led to the more descriptive term ‘food swamp’.⁵⁹

Because they offer an abundance of nutrient-poor, ultra-processed, fatty and sugar-sweetened foods (and limited or no options for healthy food), food deserts and swamps are by their nature obesogenic environments and have been found to strongly predict obesity rates.⁶⁰ ⁶¹ The high prevalence of food deserts in low-income, minority and underserved neighbourhoods⁶² also means that the already vulnerable and disadvantaged children living in these areas face increased risks of suffering overweight, obesity and the lifelong burden of NCDs.

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SPOTLIGHT

Childhood obesity: An urgent concern for China

Amid rapid economic growth and urbanization, China has experienced a remarkable shift in malnutrition since 1985. While the rate of stunting among school children declined from 16 per cent in 1985 to 2 per cent in 2014, rates of overweight and obesity increased from 1 to 20 per cent.⁶⁸

China is now home to one of the largest groups of obese children worldwide.⁶⁹ In 2015, the Global Burden of Disease reported over 15 million obese children (aged 2–19) in China.⁷⁰ The Chinese Center for Disease Control and Prevention put the total number of both overweight and obese children at 120 million in 2012.⁷¹

Boys are at greater risk of suffering overweight and obesity than girls:⁷³ 21 versus 12 per cent, according to a 2018 study among 9–11-year-olds.⁷⁴ Overweight and obesity are also more prevalent in wealthy households,^{75, 76, 77} and rates are significantly higher among schoolchildren in urban areas, although this disparity is narrowing and has even converged in some affluent areas.^{78, 79} Overall, the children at greatest risk of being overweight or obese are only-sons from wealthy, urban households.

Why is this happening?

Many factors have led to the rise in overweight in China. Rapid economic development, urbanization and technological advancement have brought changes in lifestyle and behaviour. These are evident in decreased physical activity among children, together with a shift in diet away from the traditional cuisine that is rich in plant foods and grains prepared at home, to a modern diet high in meat, sugar and fried foods, and often consumed in snacks or away from home.^{80, 81} Consumption of sugar-sweetened beverages (SSB) also plays a role.⁸²

Decreased physical activity – without decreased food intake – puts children at risk of overweight. In 2006, the Chinese Government launched a national programme, Hundreds of Millions of Teenagers Sunshine Sports, which aims to provide 85 per cent of schoolchildren with more opportunities for exercise and physical activity. In line with the WHO recommendation of at least 60 minutes of moderate-to-vigorous physical activity each day,⁸³ physical education was added as one of four

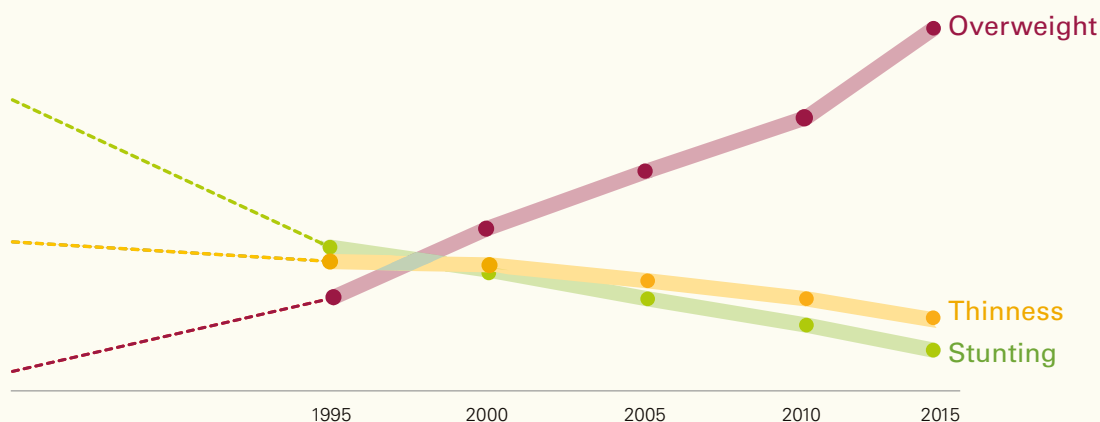
components of a students' 'all-round' development.

However, a 2010 analysis of students aged 9–18 years old showed that only 23 per cent were meeting the WHO recommendation. Physical activity was lowest among children with a heavy homework burden,⁸⁴ possibly reflecting a traditional idea in Chinese culture that 'to be a scholar is to be the top of society'.⁸⁵ This means that children routinely sacrifice play in favour of academic study.⁸⁶

Another cultural idea at play is the tendency to perceive plumpness as a symbol of wealth, high social status and good health. Providing food is a family's top priority and children are likely to be overfed, especially in families where grandparents play a major role as caregivers.⁸⁷

In response to the alarming rates of overweight and obesity among children in China, China Central Government has emphasized the urgent need for interventions and actions in their National Nutrition Plan (2017–2030) and Healthy China Action (2019–2030). ■

FIGURE 3.1 | Prevalence of stunting, thinness and overweight among children (7–18 years old) in China, 1985–2014⁷²



Note: Stunting, thinness and overweight are defined according to WHO anthropomorphic definitions.

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As children grow,
they develop
lifelong
eating habits

Although food deserts and swamps have typically been identified in high-income countries, they are increasingly found in low- and middle-income countries experiencing rapid urbanization and food-systems transformation. For example, in urban parts of Brazil, Honduras, Peru⁶³ and South Africa, food deserts are seen in communities facing a high degree of poverty, and racial, ethnic and income inequality.⁶⁴ In Mexico, where obesity prevalence ranks among the highest globally, food swamps are a bigger problem than deserts.⁶⁵

Growing up in a food desert has serious implications for a child’s nutrition and well-being. First, if families have less access to fruits and vegetables, young

children may have no choice but to eat diets lacking in diversity during a period of critical development. Second, as children grow, they develop lifelong eating habits. This means that even if access to healthy food improves, diets may not: in the United States, for example, the opening of a new grocery store in a Philadelphia food desert increased awareness, but did not alter dietary intake or obesity in the community.⁶⁶

In countries such as South Africa, Botswana and Zimbabwe, the urban dynamics are very different, with large numbers of highly mobile residents as well as informal economies and prominent gender disparities. Yet while the dynamics differ, evidence supports

BOX 3.6 | Food prices and nutrition

A recent study of global food prices indicates that healthy, nutrient-dense foods, especially animal-source food (ASF) and fortified infant cereals, are much more expensive (on a per-calorie basis) than starchy staples and unhealthy processed foods in low-income countries.

This global study, led by the International Food Policy Research Institute, set out to discover how relative prices differ across countries and regions, and whether these differences explain child feeding practices and stunting prevalence.

The study compared the *relative caloric price* of a wide range of healthy and unhealthy foods to the *caloric cost* of the cheapest staple food in each country (e.g. rice, wheat, cassava or maize). For example, a *relative caloric price* of 5 for eggs implies that it costs five times more to obtain a calorie from an egg than to obtain a calorie from rice.

In high-income countries, ASFs are relatively cheap, at only one to four times more expensive than starchy staples. By contrast, in low-income regions of Asia and sub-Saharan

Africa, which have the highest rate of stunting, ASFs can be very expensive. In sub-Saharan Africa, calories from eggs, milk and fortified infant cereals are around nine to ten times more expensive than starchy staples.

The study findings indicate that countries with higher relative prices of ASF and fortified infant cereals have much lower consumption of those foods by infants and young children, and much higher stunting rates. This suggests that improving the affordability of these foods is a key pathway to addressing the global burden of undernutrition.

The study also sheds light on why obesity rates increase with national income. Oils/fats and sugar are very cheap in all regions. However, sugar- and fat-rich processed foods are often expensive in low-income countries, but their prices decline rapidly as countries reach middle- and upper-income levels. Unhealthy processed foods are also cheaper sources of calories than healthy foods in many poor countries, which may explain the dual-burden phenomenon of rising obesity in the midst of persistent undernutrition.⁹¹ ■

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a similar conclusion: the mere presence of a supermarket may be insufficient to improve nutrition if other aspects of the food environment are not adequate.⁶⁷

Cost

Cost is a contentious issue. There is debate, for example, over whether healthy foods are more expensive than unhealthy foods – healthy foods can cost less in purely price terms, but that advantage can be outweighed by things such as the time costs of preparing food from scratch.

Despite this, it's clear that cost is a real obstacle that prevents many families from eating a diverse range of nutrient-dense foods. This is especially true for the poorest families, who have to spend a bigger share of their income on food. In the Democratic Republic of the Congo, for example, research shows

that the cost of nutrient-dense foods is a significant barrier to diversifying young children's diets,⁸⁸ while in Ghana, foods rated as healthiest by caregivers are generally also rated the least accessible due to their cost.⁸⁹ In the United States, higher costs (both in terms of price and preparation time) and less access to healthy foods in the neighbourhood help drive differences between richer and poorer families' consumption of fruit and vegetables.⁹⁰

Overall, poorer families tend to select low-quality food that costs less.⁹² This might suggest that as incomes rise, families eat better. Unfortunately, this is not always the case. Research shows that when families – urban or rural – spend more money on food, it is for both healthy and unhealthy foods,⁹³ and that a rise in income produces increased spending on convenience foods.⁹⁴

A girl crosses a puddle on a flooded road in Maputo, Mozambique. Yvonne, whose home is pictured here, lives with fourteen family members and makes a living selling vegetables from the stall.
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The impacts of climate shocks fall heaviest on the poorest families, who are both the worst affected and least able to cope

There may be several explanations for this counter-intuitive result.⁹⁵ Factors beyond affordability and price – such as convenience, exposure to marketing, physical access to healthy food, level of nutritional knowledge and cultural factors – may make obesogenic foods more desirable. Also, if women do not control the additional income, it may not be directed to the needs of the family or child. Alternatively, other underlying determinants of child malnutrition – such as food safety – may remain unchanged.

As food systems continue to transform, increasing income alone will not be enough to address today’s triple burden of malnutrition. Knowledge constraints, gender inequities, unfair marketing practices and other elements of the food environment and food supply – together with finding ways to reduce the cost of healthy foods – will all need to be addressed.

Climate shocks

Children disproportionately suffer the impacts of climate change and environment degradation. In the immediate aftermath of a flood or typhoon, for example, children are the most at-risk group for waterborne diseases, such as those accompanied by diarrhoea, and which heighten their risks of malnutrition and death.

Sustained undernutrition and loss of agricultural productivity, together with families’ livelihoods, also threaten children’s growth, development and learning, and can lead to ‘distress migration’.⁹⁶ These impacts fall heaviest on children from the poorest families, who are both the worst affected and least able to cope.⁹⁷ The cumulative effects of prolonged or recurrent climate-

related disasters and variability are often passed to the next generation of children, perpetuating and deepening cycles of intergenerational inequality.

Floods, storms, drought and extreme heat around the world have collectively doubled in number since 1990, with devastating results.⁹⁸ New crises, floods and drought have resulted in an increase of 11 per cent in people facing food insecurity since 2016.⁹⁹

Climate-related disasters cause severe food crises: drought is responsible for 80 per cent of damage and losses in agriculture,¹⁰⁰ dramatically altering what food is available to children and families, as well as its quality and price. This is true in both rural areas – for small-scale food producers, agricultural labourers and families who buy their food – and urban areas, where resulting food price hikes determine what food is accessible.

Impacts of food production on the environment and on children

Industrial food production plays a major role in the environmental effects of climate change and environmental degradation because of its tremendous ecological footprint and contribution to emissions and pollution. In addition, the heavy use of fresh water, fertilizers and pesticides also presents risks to children’s nutrition and well-being.

Greenhouse gas emissions

Food systems account for up to one-third of greenhouse gas (GHG) emissions globally, according to a 2012 study.¹⁰¹ For example, the increasing production of meat is one of the largest sources of methane.¹⁰² If current trends towards meat-heavy diets continue,

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SPOTLIGHT

Climate change threatens child nutrition in Bangladesh

Over 19 million children spread across Bangladesh are at the frontline of climate change disasters, a quarter of them under 5 years old. Floods and riverbank erosion are driving families to city slums, where they face overcrowding and a lack of access to healthy food, education, adequate health services, sanitation and safe water. In slums, children must often fend for themselves and are at greater risk of malnutrition, child labour, child marriage and exposure to pollution, violence and abuse.

Extreme climatic events such as drought and flash floods cause severe agricultural losses. In a country where over 60 per cent of the population depend on agriculture for their livelihood, this means that children from the poorest families are most likely to go hungry. Reductions in production also lead to an increase in food prices, hitting the poorest families hardest.

A rise in communicable and non-communicable diseases linked to changing climate conditions and unplanned urbanization also threaten children and their families. These include hepatitis A, cholera, dysentery, typhoid, dengue and chikungunya fever.¹¹⁷

Ruma, her husband, Ali Akbar, and their two children, Sunjida, 3, and Shahaun, 9, moved to the Chalandika slum of Dhaka after their home was repeatedly flooded by the Meghna River. "At least we can stand on dry ground here even if we struggle with the cost of living," Ruma says.

"My husband earns about 7,000 Taka [US\$83] a month. By the time we have paid our rent and bought our groceries, there is very little left over. But at least we are able to earn here, which we often weren't able to do when we lived in the countryside."

Ruma shares a small kitchen – a few planks of wood atop bamboo poles set in a swamp – with at least 10 other families. While they initially used butane gas, this proved impossible to share equitably. Wood is now preferred, further worsening the slum's air quality. Her family eats rice and lentils most days, she says, and can occasionally afford meat or fish. Her son, Shahaun, is showing signs of malnourishment.

In addition to the arduous challenge of trying to provide her family with healthy food, Ruma describes an unhealthy environment with no access to safe water, basic toilets or adequate hygiene. Electricity in the slum is irregular, and rodents and insects in their single room "make our lives an absolute misery," she says.


The Government of Bangladesh will begin the second phase of its Climate Change Strategy and Action Plan this year, placing greater emphasis on the needs of the poorest and most vulnerable, and demanding more attention and resources to ensure that child nutrition, health, education, sanitation and water, and social protection services are shielded from the effects of climate change. ■

A child wades through flood waters on her way to school in Kurigram district, Bangladesh. © UNICEF/UN0286416/Akash



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A chemical pesticide is up to 10 times more toxic to a child than to an adult



the environmental impacts of food production on GHG emissions are estimated to increase by 87 per cent.¹⁰³

To benefit both people and the planet, the EAT-Lancet Commission recently proposed a dietary shift that doubles the consumption of healthy foods such as fruits, vegetables, legumes and nuts, and halves that of less healthy foods such as red meat and added sugar. The authors note that given the unique dietary needs of children, including for high-quality protein, this “universal healthy reference diet” is for children aged 2 and above.¹⁰⁴

Food production also demands significant use of fresh water, with water scarcity already affecting children in every continent.¹⁰⁵ Further, fertilizers put aquatic systems at risk of contamination, and pesticides pose direct risks to children.¹⁰⁶ In addition to ingesting food with pesticide residue, many children are exposed to pesticides while working in agriculture, which accounts for 71 per cent of child labour.¹⁰⁷

Pre-natal exposure to pesticides can increase the risk of foetal death and birth defects, while exposure in childhood can disrupt the endocrine system, cause cancer and delay neurodevelopment. A chemical pesticide is up to 10 times more toxic to a child than to an adult, and acute poisoning usually results in death.¹⁰⁸

Biodiversity loss

Together with climate change and pollution, food production is also implicated in the loss of biodiversity. A recent UN report sounded the alarm on the scale of the problem: nearly 1 million species are threatened with extinction due to human activities.¹⁰⁹ Changes in land and water use – for example, clearing

forests for large-scale crop or livestock production systems – is recognized as a major driver of biodiversity loss.¹¹⁰

Biodiversity is not only essential for healthy ecosystems; it also directly affects food security and nutrition.¹¹¹ Children’s dietary diversity is also at stake.¹¹² With less diversity in crop production, diets are becoming increasingly homogenous around the world (*see Chapter 1*).¹¹³ Just three crops – rice, wheat and maize – now make up nearly two-thirds of the global caloric intake.¹¹⁴

Without improvements to today’s dietary patterns and food production, children, their families and future generations are likely to face greater risk of food insecurity and malnutrition brought on by climate shocks and environmental degradation.

Conclusion

The causes of child malnutrition are more complex and far-reaching today than they were in 1990. Sweeping changes, seen in globalization, unplanned urbanization and climate change, are exacerbating already unfair outcomes for the poorest and most excluded children and their families. Worldwide crises threaten to halt or reverse progress in reducing child undernutrition.

At the same time, there is greater acknowledgement that the exclusion of certain groups from essential foods, services, resources and decision-making is unfair and avoidable – and that children are paying the price.

Researchers, experts and practitioners also recognize and are expanding the evidence-base on the causes and risks

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of malnutrition being passed from one generation to the next. This knowledge and attention have the potential to make interventions more effective and to drive action. Even so, more is needed in research and practice to fully understand the particular circumstances of children from different population groups. For example, few empirical studies exist on aspects beyond poverty and gender. For a larger, more sustainable impact, practitioners will need to pay explicit attention to addressing marginalization and gender inequities that underpin disparities in the longer term.

If food systems are to transform and deliver better diets for children, the broader forces that affect children's

diets, growth and development – resources, governance and norms – will also require more attention (*see Chapter 4*). They can be broken down, examined and understood. Such analysis reveals power structures in food systems and where power is exerted, which allows the nutrition community and the public to leverage and exploit spaces for change.

Such change is already happening in many countries (*see Chapter 4*). With greater coordination and implementation of policies and programmes across the food, health, water and sanitation, education and social protection systems, it can be transformative. ■

A girl carries a bucket of water collected from a nearby dry river bed in northern Kenya. Turkana is one of the districts hardest hit by prolonged drought and recurrent cholera. © UNICEF/UN0275168/Njuguna



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SPECIAL SECTION

Nutrition in emergencies

UNICEF and its partners treated more than 3.4 million children with severe acute malnutrition (SAM) in emergency contexts around the world in 2018. The greatest numbers of children were treated in Afghanistan, Chad, the Democratic Republic of the Congo, Ethiopia, Nigeria, Niger, Somalia, South Sudan, Sudan and Yemen. Almost 90 per cent of the children recovered.¹²⁰

In Sudan, as of April 2019, 11 of 18 states have global acute malnutrition rates above the Integrated Food Security emergency threshold of 15 per cent. While 2.4 million children under 5 suffer from wasting a year, close to one third (700,000) of those suffer from SAM, with high rates in Eastern Sudan and among South Sudanese refugees.¹²¹

Historically, efforts to address nutrition in emergencies focused largely on identifying cases of wasting – a visual indication of severe acute malnutrition.¹²² However, the complexity and protracted nature of crises have led to a global recognition that many forms of malnutrition occur in emergency settings. New evidence shows that these forms can include stunting and micronutrient deficiencies.¹²³ In protracted humanitarian crises, the prevalence of stunting is increasing, while rates of wasting continue to be high.¹²⁴ As a result, global nutrition leaders are turning to approaches that combine short- and long-term solutions to the problems of malnutrition.

These efforts focus on preventing avoidable deaths and promoting growth. UNICEF and its partners conduct nutrition assessments, identify and treat children, and provide fortified foods and supplements to prevent nutrient deficiencies. They also promote breastfeeding and provide guidance on feeding infants and young children, which can save lives in emergency situations.

Addressing nutritional needs in complex and protracted emergencies involves partnerships around the world that work to save lives and provide local and national governments with the assistance they need to address malnutrition in communities and to develop emergency response plans during crises.

While 86 per cent of international humanitarian assistance is distributed in countries experiencing long- and medium-term crises, emphasis is increasingly placed on resilience planning.¹²⁵ Between 2005 and 2017, the average length of crises that received an inter-agency funding appeal rose from 4 to 7 years.¹²⁶

Yemen

In Yemen, home to Moteab and his family, protracted conflict, economic crisis and the dismantling of essential services, including those for health and water and sanitation, turned daily life into a “living hell”.¹²⁷ His father’s job, transporting goods in a wheelbarrow, provided the family with the bare minimum of food – bread for breakfast, vegetables, usually potatoes, for lunch and anything left over for dinner.

By the time Moteab turned 2 years old, the combination of poverty and protracted conflict left him in a struggle for his life. “He would throw up whatever he ate or drank,” his mother said. After seven months of repeated

illnesses with vomiting, diarrhoea and weight loss, his mother was directed to a free health centre in Abs, where her son was diagnosed with SAM.

Moteab is just one of the 400,000 children in Yemen who suffered from SAM in 2018.¹²⁸ The humanitarian crisis is one of the worst in recent history.¹²⁹

In emergencies around the world, treating children like Moteab involves tools and approaches to providing a combination of routine medication, therapeutic foods, individualized care and links to other social services such as for hygiene and sanitation.¹³⁰

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For example, in Yemen, partners employ the Standardized Monitoring and Assessment of Relief and Transitions (SMART), a methodology that allows for systematic collection of reliable information that can be used to make decisions and allocate resources to priority needs.

Community management of acute malnutrition (CMAM) is also an important approach for addressing SAM in emergencies around the world. In Yemen, by 2018, UNICEF and its partners were supporting more than 3,300 outpatient therapeutic feeding programmes, such as the one in Abs where Moteab received treatment.¹³¹

Though most children can be treated at home with ready-to-use therapeutic foods (RUTF), Moteab's condition required treatment at a stabilization centre in Aslam, one of 69 centres for children who experience health

complications in addition to SAM. However, as fighting closed in on the area, Moteab was moved to Sana'a, where he and his family were provided with the support necessary for treatment in a therapeutic feeding centre at a hospital.

For Moteab, the life-saving nutrition services he needed were provided free to his family. They are services that have set him on the path to recovery. "I can see improvement since his admission to Al-Sabeen Hospital," his mother says. "He has been receiving very good healthcare. He now finishes the entire feed of the specialized milk that is given to him and interacts with people around him."

"I am happy," she adds, "but I am worried about the other children in our district that might reach my son's situation if they do not receive support and care quickly."

Niger

In Niger, where the prevalence of stunting for children under 5 is 41 per cent and anaemia is 77 per cent,¹³² doctors often treat SAM that is linked to preventable disease. Dr Abale Laoali at the Intensive Nutritional Rehabilitation Centre in Diffa explains, "Throughout the country, the children who are severely wasted and do not have access to adequate healthcare experience higher rates of malarial infections. We've also observed that children affected by malaria experience a decrease of defences in their immune system. This makes them lose their appetite, and to suffer from vomiting, pneumonia or severe diarrhoea. At this point, the risk of severe malnutrition is very high due to the lack of food, the diseases, the poor health and hygiene conditions – and displacement."

One of Dr Laoali's patients is 3-month-old Sani, diagnosed with SAM, pneumonia, malaria and a congenital heart

disease. Two years ago, his mother Fatima fled Damasak, Nigeria, a town held by Boko Haram, with her three children. They have since been continuously displaced. During her pregnancy with Sani, Fatima was anaemic and suffered food insecurity and high levels of stress. After arriving at the temporary site for displaced people in Chetimari, Fatima brought Sani to the nearest health centre. "The nurses told me that my little baby was in danger because, in addition to malnutrition, he had contracted malaria and pneumonia," she says. "He didn't tolerate my breastmilk, he didn't have any appetite and he vomited a few times. I began to fear for Sani's life."

After 20 days of hospitalization and thanks to the guidance of healthcare workers and support from partners, Sani is breastfeeding again and has regained weight. His malaria symptoms are gone and he is breathing without the help of an oxygen machine. ■





PERSPECTIVE

Sesame Workshop’s Raya teaches children healthy habits

Sherrie Westin
President,
Social Impact and
Philanthropy,
Sesame Workshop

For 50 years, Sesame Workshop has focused on a whole-child curriculum – not only delivering the academic and socio-emotional lessons children need to thrive, but also teaching critical skills in health and resilience.

Many children around the world suffer from malnutrition, which can be caused by a lack of access to healthy food and by childhood illness. In fact, malnutrition and preventable and treatable illnesses such as pneumonia and diarrhoea are the leading causes of death for children under the age of 5.

We also know that our characters have a great potential to talk to children, model behaviours and provide the language to talk about tough topics. That’s why we created Raya, a special Sesame Street Muppet. She’s 6 years old, with long braids and a beaming smile – and she teaches children in 11 countries, and 30 languages life-saving lessons about water, sanitation and hygiene (WASH) through our WASH UP! initiative, in partnership with World Vision.

We’ve seen encouraging results. Independent research conducted with support from the Gates Foundation found that our programme led to measurable improvements in WASH knowledge, attitudes and behaviours among children in Bangladesh, India and Nigeria. Raya and WASH UP! continue to inspire tens

of thousands of children to bring positive change to their homes, schools and communities.

As our ‘global health ambassador’, Raya was the perfect companion to help me with this piece. Thanks for chatting with me today, Raya. I know you know a lot about how to stay healthy!

Raya

I sure do! Like how important it is to make sure water is clean before drinking it. I tell my friends that one way you can get sick is from tiny germs you can’t even see. And how we all get germs on our hands, so it’s important to wash them for 20 seconds with soap and water after we use the bathroom and before we eat food, to scrub those germs away!

Sherrie

What about your friends living where there is no clean running water?

Raya

Lots of my friends around the world do not have running water, but they still have to wash the germs off. One fun thing we make together is called a tippy tap. It’s a hand-washing station people can build anywhere – they’re easy to make and use! And if you do have to go to the bathroom outside, it’s really important to wear sandals or shoes to the latrine to protect your feet from germs too, because that’s another way you can get sick.



and Raya
Global Health
Ambassador

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Sherrie

That's right, Raya. And when children get sick, illness can prevent their bodies from absorbing the nutrients they need to get well, stay healthy and grow properly. That can cause something called malnutrition.

Raya

So getting sick is the same thing as *malnutrition*?

Sherrie

Getting sick is one of many reasons for malnutrition. Malnutrition can also mean not having enough food to eat, or not eating enough of the kinds of nutrient-rich foods that help children grow into healthy adults.

Raya

I think I get it! I have a friend who taught me about different kinds of food. You know him too!

Sherrie

Are you talking about a certain blue, fuzzy monster named ...

Raya

Cookie Monster!

Sherrie

He does know a lot about his favourite subject. What did Cookie Monster teach you?

Raya

He taught me and my friends on Sesame Street about the difference between 'sometimes foods' and 'anytime foods'. Cookies are a 'sometimes food', because they're something we should eat only once in a while as a treat. But an apple is an 'anytime food' because it's full of vitamins and an important part of a healthy diet. I can eat a delicious apple any time!

Sherrie

I love that Cookie Monster taught you something important about nutrition, and you're telling other people like me about it. Just like when you show children that washing up is easy to learn. Children who learn life-saving behaviours from you then teach their families.

Raya

Right! Healthy habits are contagious!

Sherrie

So you're making an important difference in the world by helping so many children stay healthy. Keep up the great work!

Raya

Thanks! I will! ■

Sherrie Westin is President of Social Impact and Philanthropy for Sesame Workshop, the non-profit educational organization behind Sesame Street. Westin leads the Workshop's efforts to serve vulnerable children through mass media and targeted initiatives. She serves as Sesame Workshop's chief mission ambassador, raising awareness, developing strategic partnerships and cultivating philanthropic support to further the Workshop's mission to help children everywhere grow smarter, stronger and kinder.

Sesame Workshop's global health ambassador, Raya, is an energetic 6-year-old who's guiding conversations all over the world about clean water, handwashing and proper latrine use. Raya always remembers to wash her hands with soap and water and to wear her sandals in the latrine to avoid contracting illness. She encourages children to share what they learn with friends and family, making good habits contagious.

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04 RESPONSES TO MALNUTRITION

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The evolving nature of global child malnutrition demands a new response: one that can deliver nutrition-specific interventions and nutrition-sensitive development in a more coordinated fashion. The response must acknowledge the central role and responsibility of the food system, and work together with the health, water and sanitation, education and social protection systems to provide better diets for children.



- A systems approach to nutrition reflects the reality that child nutrition has multiple determinants and the shared responsibilities of multiple sectors and stakeholders, public and private
- Recent years have brought growing momentum to improve food systems, but the unique needs of children have been ignored. Children's needs must be at the heart of food systems.
- Nutrition-specific approaches are also needed in four key supporting systems – health, water and sanitation, education and social protection.

Tuyisenge holds her 11-month-old daughter, Fabiola, while a community health worker measures her mid-upper arm circumference at a UNICEF-supported care group growth monitoring session in Musanze District, Rwanda. "Before I used only potato and beans, no other vegetables," Tuyisenge says. "Now I use all kinds of vegetables as well as small fish. I see the difference in the growth of my children."

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Introduction

For too long, nutrition was on the periphery of the global development agenda. In recent years, however, it has gained greater attention, reflecting growing recognition of the social and economic benefits of investing in nutrition. As the body of research on effective interventions has expanded, global policy discussions increasingly focus on evidence-based approaches.¹

The list of interventions is long, and growing: from promoting breastfeeding, to better supporting the poorest families; from making labelling clearer and more informative, to tackling iron deficiency anaemia and other forms of hidden hunger; from improving children’s food environments, to making safe drinking water available everywhere – a huge array of actions can be taken (and in many cases, are being taken) to improve children’s nutrition.

Clearly, much more needs to be done. Nevertheless, there are causes for hope. More and more governments are laying out strategies to improve nutrition. In many countries, these represent an important first step that can be built on in the years to come. For these approaches to make a real difference, governments need to recognize three key realities.

- First, there are **no easy fixes if nutrition goes wrong in childhood**. The nutritional needs of children are unique, and uniquely important. That’s why children and young people must be at the heart of thinking around food and nutrition.
- Second, **we need to meet malnutrition challenges by working across all relevant systems** and sectors. Food systems need to better serve children’s needs, but other systems – notably, those for health, water and sanitation,

A baby eats a piece of bread while being carried in the Hanaq Chuquibamba community in Peru.
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Nutrition and the Sustainable Development Goals



Source: www.un.org/sustainabledevelopment/hunger/

education and social protection – also have crucial roles to play as part of a coordinated and systemic approach.

- Third, while **governments may be at the forefront in setting policies, strategies and programmes, they cannot do it alone**. Business and civil society groups, as well as families, children and young people themselves, all have important roles to play.

How governments are responding to a growing momentum

In 2008, the Copenhagen Consensus concluded that nutrition interventions

were among the most cost-effective in development.² That same year, *The Lancet* published its landmark series on Maternal and Child Undernutrition, which highlighted the ‘golden window’ for nutrition in the first 1,000 days after conception³ (later followed by an examination of the growing problem of overweight).⁴ The momentum from these critical conversations catalysed nutrition as a global development priority, leading to a number of global initiatives, including the creation of the Scaling up Nutrition (SUN) movement, a multi-stakeholder, multi-sectoral approach to support country-level strategies to combat malnutrition.

Building on the World Health Assembly’s Global Nutrition targets, the UN Sustainable Development Goals (SDGs) cast nutrition as a central input and outcome of sustainable

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163 countries now have comprehensive or topic-specific policies, strategies and plans that are relevant to nutrition and the promotion of healthy diets



development. Goal 2 specifically calls on Member States to “end hunger, achieve food security, improve nutrition, and promote sustainable agriculture.” Indeed, 12 of the 17 SDGs contain indicators that are crucial for nutrition.⁵ Adding to this global ambition, the United Nations General Assembly proclaimed the Decade of Action on Nutrition (2016–2025), enhancing the global commitment to eradicating hunger and preventing all forms of malnutrition.

This growing global momentum has spurred many governments to update or develop new approaches to nutrition. According to WHO, 163 countries now have comprehensive or topic-specific policies, strategies and plans that are relevant to nutrition and the promotion of healthy diets.⁶

These signs of commitment are welcome: however, there are reasons to be cautious. First, many of these policies are still nascent – one third date from 2015 or later – so it will take time to assess their impact. Second, national nutrition policies do not always fully incorporate goals, targets and indicators related to the World Health Assembly’s Global Nutrition Targets. The incorporation of targets and SMART commitments⁷ is fundamental to ensuring that governments are held accountable and that nutrition interventions are effectively monitored.⁸ Finally, there is evidence that nutrition policies and programmes are still often fragmented and uncoordinated.⁹

Scaling-up nutrition results

National approaches have increasingly addressed nutrition concerns through interventions in a number of traditionally defined sectors, such as health and

education. Some of these interventions can be thought of as direct, or nutrition-specific, because they directly address the immediate and some underlying causes of malnutrition, particularly in the most disadvantaged populations, for example in breastfeeding counselling or the early detection and treatment of severe acute malnutrition (SAM). Others can be thought of as indirect, or nutrition-sensitive, because they aim to address the basic and some underlying causes of malnutrition, such as through promoting social safety nets, education and empowerment of women.

Nutrition-sensitive interventions boost the effectiveness of nutrition-specific interventions. In Brazil, for example, a nutrition-sensitive social protection programme utilizing conditional cash transfers has reduced malnutrition-related child mortality. Pregnant and lactating women receive cash transfers on condition that they attend pre- and post-natal appointments and participate in educational activities on nutrition and health.¹⁰ Likewise, the education sector provides a compelling entry point for governments to address malnutrition using a nutrition-sensitive approach, particularly among the most vulnerable. Pathways include helping children develop healthy dietary habits from an early age and improving the nutrition literacy of adolescent girls.

The benefits of mixing nutrition-specific and nutrition-sensitive approaches across a range of sectors are clear.¹¹ However, many actors remain focused exclusively on nutrition-specific approaches.¹² And because of a lack of coordination among actors and sectors, efforts to promote better diets for children and prevent all forms of malnutrition are often falling short.

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It is clear, then, that translating political commitment to tackle malnutrition into action requires more than just increased attention; it also requires the mobilization of government systems, institutions and resources, and coordinated strategies.¹³ Success requires more than isolated sectoral results – it requires a coordinated systems approach in which food systems themselves are transformed and other key systems work together with the food system to deliver nutrition results at scale.

Multiple responses to a multifaceted challenge: A systems approach

Why take a systems approach? First, it better captures the importance of the interactions and interconnections across different areas, such as food, health and education, and crystallizes a common purpose: better diets and better nutrition for children, adolescents and women. Second, a systems approach avoids the simplistic thinking that malnutrition has straightforward determinants that operate along linear pathways. Instead, it puts the focus on multiple, interconnected determinants, and recognizes shared responsibility, and the need to mobilize attention and resources from a wider variety of societal and governmental institutions.

Five systems in particular have crucial roles to play. The food system must respond and provide better dietary choices for children, adolescents and women. The health, water and sanitation, education and social protection systems are also fundamental in driving transformation, particularly in the personal and external food


environments, and delivering the necessary services to support better diets, practices and nutrition outcomes. Achieving results at scale depends on the robustness of these five leading systems to implement nutrition-specific and nutrition-sensitive interventions at every stage of life (*see Figure 4.1*).

This is not to say that other systems cannot also play a part. Information systems, for example, are fundamental to the collection, analysis and interpretation of nutrition-related data, and can provide the basis for timely and effective decisions to improve nutritional outcomes among children. Many countries have different forms of information systems in place to support nutrition interventions.

A systems approach targets the key systems that have the ability to deliver nutrition interventions at scale, making them more accountable for nutrition results beyond their sectoral objectives. To give an example, in many countries, nutrition is viewed as being within the remit of the health sector, which is given the main responsibility for delivering nutrition interventions. However, although the health system is clearly an important pathway for scaling up certain nutrition interventions, many crucial determinants of child malnutrition, such as diet diversity, are well beyond its normal scope. Instead, action is needed across multiple systems to ensure quality coverage.

How and where this happens will vary according to the context. Innovative approaches to mobilizing systems for improved nutrition are certainly needed. As the examples in this chapter show (*see Special Section*), there is no shortage of success stories and lessons learned that can help to show the way forward.

A systems approach targets the key systems that have the ability to deliver nutrition interventions at scale



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Multiple responses to a multifaceted challenge: A systems approach to nutrition



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A systems approach makes multiple systems accountable for nutrition results beyond sectoral objectives



The food system

includes all of the activities and actors involved in bringing food from production to consumption and through to disposal (see Chapter 1). This system includes intermediate steps, such as processing, distribution, marketing and retail. It is organized into four main parts: food supply chains, external food environments, personal food environments and the behaviours of caregivers and consumers with respect to food.



The health system

includes preventive services as well as curative care. It is more than just service delivery: governance, financing, supplies and equipment, work-force and information systems are all integral parts of the health system. A strong health system supports family practices, and produces equitable survival, growth and development outcomes for children, adolescents and women.



The water and sanitation system

comprises the policies, programmes, services, facilities and actors involved in providing safe drinking water and safe sanitation infrastructure. Policies often target the most vulnerable populations to address their basic needs. A strong water and sanitation system is essential to ensuring safe food, safe drinking water, and clean and healthy environments for children, adolescents and women.



The education system

refers to formal and informal institutions designed to educate children, from basic kindergarten to secondary school. While public schools are often the primary consideration of education system policy, private schools can also follow national education guidance. A strong education system has trained teachers, sound pedagogy, solid infrastructure and resources, and should be used as a delivery system to improve nutrition outcomes.



The social protection system

comprises a set of public and private policies and programmes that aims to prevent, reduce and eliminate economic and social vulnerabilities to poverty and deprivation. Nutrition-sensitive social protection programmes can mitigate the effects of poverty on the nutrition of children, adolescents and women. A strong system combines different programmes, often focusing on the protection of vulnerable groups, and breaking the cycle of poverty.

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SPECIAL SECTION

What does a systems approach to nutrition look like in practice?

Meeting the malnutrition challenge requires action across five key systems: those for food, health, water and sanitation, education and social protection. There are already many examples from around the world of how each of these systems is helping to support improvement in maternal and child nutrition.

Food system



Commercial fortification of staple foods with micronutrients is one of the most successful and cost-effective interventions to combat hidden hunger.

In the 1920s, Switzerland

and the United States started adding iodine to salt, virtually eliminating goitre and cretinism – the most severe forms of iodine deficiency disorders – and paving the way for subsequent fortification initiatives.¹⁴ Today, many countries routinely fortify refined cereal grains with micronutrients.¹⁵

While technically simple, commercial fortification requires cooperation between government agencies and a mature food industry with centralized and specialized processing and an adequate distribution infrastructure. It also requires monitoring and quality control and is more effective when paired with consumer education campaigns to promote consumption. Commercial fortification has been widely successful in urban areas, where people typically purchase food in central markets and stores. It is more challenging in rural areas, where the distribution infrastructure may be more patchy.

Universal salt iodization and large-scale food fortification

Universal salt iodization is one of the great global nutrition success stories. Today, iodized salt is

available to 86 per cent of world's households. The result is that, between the early 1990s and 2016, the number of countries in which iodine deficiency is a public health problem fell from 113 to just 19.¹⁶ This progress has led to a major decline in iodine deficiency disorders and has contributed to improving the intellectual development of millions of children. Salt iodization is also highly cost-effective, costing only about US\$0.05 per person per year.¹⁷

Following the success of salt iodization in developed countries, momentum gathered to scale it up globally. In 1994, WHO and UNICEF endorsed universal salt iodization as a safe, effective and sustainable way to address iodine deficiency.¹⁸ However, salt iodization has made slow progress in Southeast Asia and sub-Saharan Africa, especially in rural areas with poor infrastructure and in countries that rely on small-scale salt processors. As with any form of food fortification, successful scale-up requires political commitment, engagement from the food industry, and links with national nutrition programmes and other development priorities. Programmes also need to align with changing dietary patterns. For example, the increased consumption of salt through processed foods, rather than as table salt, means that food industries should ensure they use iodized salt. Salt iodization is also compatible with WHO's recommendation to reduce salt intake to less than 5g a day. By ensuring that all food-grade salt is iodized, this limit can be safely met.¹⁹

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Large-scale food fortification

The success of salt iodization paved the way for subsequent fortification initiatives around the world. In the United States, for example, salt iodization was followed in 1933 by the fortification of milk with vitamin D to prevent rickets and, in 1942, with the requirement to add thiamine, riboflavin and iron to flour.²⁰ In 1996, the government mandated the addition of folic acid to flour to reduce the prevalence of neural tube defects, the most common of which are spina bifida and anencephaly, a fatal condition. Subsequent assessments demonstrated that the prevalence of neural tube defects had decreased by 19–32 per cent. Numerous other countries have seen similar improvements.²¹ New national flour fortification programmes are being considered, including in high-income settings such as the United Kingdom, where folic acid fortification is under review.²²

Currently 81 countries – from South Africa, Morocco and Jordan, to Indonesia, to Mexico and Uruguay – mandate fortification of wheat flour alone or in combination with maize flour and rice.²³ Even so, significant untapped potential remains: if all countries worldwide fortified flour with folic acid, this could prevent an estimated 230,000 cases of neural tube defects a year.²⁴ Other obstacles include the reality that national flour fortification standards do not always meet minimal requirements for key nutrients such as iron, zinc and vitamin B12.²⁵

As set out in the 2015 Arusha Statement on Food Fortification,²⁶ critical actions are still needed. These include improved oversight and enforcement of food fortification standards and regulations, better evidence to guide policy and programme design, stronger accountability and global reporting, continued advocacy, and additional (albeit modest) investment.

Health system



Health facilities can play a major role in improving nutrition outcomes, but all too often, these opportunities are missed. For national health systems to meet their full potential, they need to deliver preventive services and curative care, but

also to foster positive family practices, such as breastfeeding, that can significantly scale up nutrition results. Cambodia, Rwanda and India are three examples of countries where the health system is taking on this role.

Cambodia has invested substantially in awareness-raising in communities, as well as in improved quality of care around the time of delivery. As a result the percentage of deliveries by a skilled birth attendant doubled between 2005 and 2014 to 89 per cent in 2014, while institutional deliveries increased from 22 per cent to 83 per cent. Importantly, rates of early initiation of breastfeeding rose more than tenfold between 1998 and 2014 to 63 per cent.²⁷ The programme has also helped stop the rise of breastmilk substitute use among newborns.²⁸

Rwanda has also made significant progress. It implemented an intensive and sustained communication campaign around feeding practices, including early initiation of breastfeeding, and the Baby-Friendly Hospital Initia-

tive. By 2014, skilled birth attendants assisted at 91 per cent of deliveries, up from 39 per cent in 2005, including at nearly all births in health facilities. The rates of early initiation of breastfeeding also increased, from 64 per cent in 2005 to 81 per cent in 2014.²⁹ Rwanda now has 45,000 community health workers who counsel mothers about adequate feeding practices and safe deliveries.

In India, national and state governments implemented a multi-pronged strategy to support breastfeeding, including large-scale programmes, effective capacity-building initiatives, strong partnerships, community-based action, and communications campaigns. As a result, early initiation of breastfeeding rose from 24.5 per cent in 2006 to 44.6 per cent in 2014. The increase was even greater – from 12.5 per cent in 2006 to 34.4 per cent in 2014 – in the seven states with the highest rates of newborn deaths.^{30, 31}

These examples demonstrate how countries can integrate and improve the quality of breastfeeding counselling within the health system to achieve results at scale. All three countries were able to strengthen the capacity of health workers and health facilities to deliver nutrition interventions. These positive results demonstrate the benefits of institutionalization, protection, promotion and support of breastfeeding in maternity facilities, particularly in the first days of life.

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Water and sanitation system



By causing conditions such as diarrhoea and dysentery, which prevent children from absorbing nutrients, poor water and sanitation are major factors in malnutrition. Improvements in the

water, sanitation and hygiene (WASH) system, combined with nutrition interventions, can therefore play a critical role in preventing stunting and other forms of malnutrition. Such approaches have been adopted in Pakistan and Ethiopia, which both suffer high rates of stunting – more than one third of children aged under 5 are affected – and where access to basic sanitation services is still a major national concern.

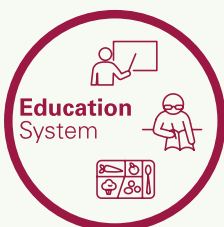
In Pakistan’s Sindh province, UNICEF Pakistan and its partners implemented an integrated package of WASH and nutrition interventions focused on the crucial first 1,000 days. The WASH activities focused on reducing the incidence and severity of infection and controlling environmental enteropathy, a chronic inflammation of the gut. Interventions included maintaining safe water supplies, encouraging community-based approaches to eliminate open defecation, improving hygiene behaviour, and developing service provider capacity. Challenges remain, but there has been significant progress. Community health workers

have been mobilized, and WASH clubs have been formed in schools to empower children to promote positive practices. In total, an estimated 922,000 children aged under 5 and women have been reached with packages of nutrition services, including micronutrient supplementation.

In Ethiopia, UNICEF implemented a Baby WASH programme in 2017, with the aim of protecting babies and young children from microbial infections during play and feeding. The programme includes interactive communication for development tools and materials, including a radio drama series, public service announcements (PSAs), and discussion groups with mothers.

The intervention has helped change behaviours. According to an internal evaluation report, almost three quarters of those who listened to the radio programmes and PSAs said they had made changes. Around half said they were washing their hands more often and using soap, while around a quarter had stopped open defecation. Work has already begun with the Ministry of Health to scale up the approach across the country, including the development of national guidelines and a training manual, and the launch of a national training initiative for trainers who will implement the Baby WASH approach in the regions.³²

Education system



School-based food and nutrition interventions can play a key role in creating an environment that provides and promotes healthy diets and nutrition among children and

adolecents.³³ By educating and influencing children (and their parents) to make healthy food choices, education systems can deliver not only

nutrition-specific interventions but also ensure nutrition-friendly environments.

In India, the adolescent anaemia control programme shows how the education system can work to scale up nutrition-specific results. The programme began in 2000 with the launch of a pilot targeting adolescent girls in 2,000 public schools across five states. The pilot delivered three main interventions: weekly iron–folic acid

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supplementation, monthly nutrition and education, and twice-yearly deworming. It benefited 8.8 million girls aged 10–19. After a year, the programme reported a significant decrease in the prevalence of moderate to severe anaemia.³⁴

Based on the positive outcomes and lessons learned, the Government of India launched the national weekly iron and folic acid supplementation programme in 2012, targeting 116 million adolescents aged 10–19, across 32 states. For the first time, almost 40 million boys were also in-

corporated in the programme. By 2016–2017, the national programme was reaching 36 per cent of the targeted adolescents, and all states had taken key steps to maintain the sustainability of the programme. Co-led by the Ministry of Health and Family Welfare, the Ministry of Education and the Ministry of Women and Child Development, the programme is a promising example of the sort of coordination among different government institutions that is fundamental to building an effective education-system approach to improving nutrition.

Social protection system



Social protection programmes are a powerful instrument to not only lift families and children out of poverty, but also to promote maternal and child nutrition.

A range of interventions,

such as conditional and unconditional cash transfers, food rations and school feeding, can all help limit the long-term effects of deprivation and provide communities with the means to access and afford nutritious food. Cash-transfer programmes, in particular, have proven benefits for the nutritional status and health outcomes of children.³⁵

Social protection programmes have been widely implemented in Latin America, and have helped countries reduce poverty, promote food security and improve nutritional outcomes for children, young people and families. In Brazil, for example, the Bolsa Familia ('family allowance') programme launched in 2003 reached more than 13 million families in its first decade of implementation, and contributed significantly to social and public health improvements.³⁶ Specifically focused on nutrition, the programme played a vital role in helping low-income families to purchase food, thus enhancing their dietary quality and diversity.³⁷ Among children aged under 5, the programme was crucial to

reducing child mortality, which is closely linked to malnutrition. A study published by *The Lancet* showed that Bolsa Familia was crucial to reducing child mortality among children aged 5, by incentivizing pre- and post-natal care and supporting immunization campaigns and health and nutrition activities for mothers and children.³⁸

Similarly, Mexico's conditional cash-transfer programme, Prospera, has benefited around 7 million families.³⁹ Child nutrition has been a major component of the programme from its inception. Families included in the programme benefit from regular maternal and child services where children's nutritional status is monitored. Nutrition services aim to improve families' capacity to eat healthily and feed their children a nutritious, safe and affordable diet. As studies have shown, the programme has helped to promote nutrition and optimum growth, and has also enhanced dietary diversity among families and children.^{40, 41}

These large-scale interventions prove the importance of nutrition-sensitive social protection systems, helping countries not only to mitigate the effects of poverty, but also to strengthen families in their childcare role, which is a fundamental aspect of ensuring healthy eating habits and better child nutrition. ■

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Food systems need to be reshaped from simply feeding people to nourishing people – especially children – well

Putting children at the heart of food systems

Effective food systems (*see Chapter 1*) are fundamental to securing nutritious, safe, affordable and sustainable diets for all children, everywhere. Despite their central role, however, food systems have been largely absent in policy and programming for maternal and child nutrition. Fortunately, attitudes and approaches are changing. There is growing recognition in the international community that food systems need to be reshaped from simply feeding people to nourishing people – especially children – well.

An important early step in this thinking came with the Rome Declaration on Nutrition in 2014. Since then, reports and studies have shed light on particular aspects of food systems.⁴² For example, a report by the High Level Panel of Experts on nutrition and food systems dives deeper into the crucial role of food environments in shaping dietary choices, as well as the potential pathways in all food systems – whether traditional, modern or mixed – towards more sustainable and healthier diets.⁴³

Among other insights, the role of key stakeholders has been emphasized by the Global Panel on Agriculture and Food Systems for Nutrition,⁴⁴ while the Global Nutrition Report has underlined the role of government and business in ensuring that food systems and food environments support healthy diets.⁴⁵ Most recently, in early 2019, the EAT-Lancet Commission highlighted the need to accelerate the transformation of food systems to achieve not only the SDGs, but also climate goals.⁴⁶

This momentum needs now to extend to ensure that food systems meet the needs of children and young people. Given children's unique nutritional requirements, there is an urgent need to put their needs at the heart of food systems. Among key issues that need to be considered are interventions to improve dietary choices in food environments, i.e., the points at which children, young people and caregivers interact with the wider food system, such as stores, markets, restaurants and fast-food outlets and marketing and advertising. The roles of legislation and regulation, and how business and the private sector can better support nutritious diets for children, are also vital components of a systems approach.

Supporting food system transformation through legislation

Legislation can play a fundamental role in promoting better dietary choices for children and young people at various points in the food system, such as by regulating the marketing of unhealthy food to children and of breastmilk substitutes to caregivers, by levying taxes on unhealthy foods to create price disincentives, and by increasing demand for and access to nutritious foods. It also creates a level playing field for all companies.

The International Code of Marketing of Breast-milk Substitutes (BMS), for example, is a well-established regulatory framework that protects and promotes breastfeeding, while ensuring the proper use of breastmilk substitutes, when necessary, by prohibiting their promotion and ensuring adequate product labelling.⁴⁷ (Nevertheless, according to the Access to Nutrition Foundation, “The

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world's six largest baby food companies continue to market BMS using marketing practices that fall considerably below the standards of the Code".)⁴⁸ As of April 2018, 136 of 194 countries had at least some form of legal measure in place to address the provisions of the Code. Several countries have also made significant efforts to address inappropriate marketing practices of commercial complementary foods.⁴⁹ Despite these efforts, most countries still lack an effective and sustained response to tackling the marketing of BMS and other non-appropriate foods for infants and young children.

Sugar taxes

In response to rapid rises in overweight and obesity, several countries have applied taxes on sugary foods, with sugar-sweetened beverages (SSBs) the most common target. Consumption

of such drinks is increasing in most countries, particularly among children and adolescents, and over-consumption contributes to unhealthy diets and weight gain.⁵⁰ According to the Global Nutrition Report, 59 countries have some sort of tax on SSBs in place.⁵¹

Comparing sugar taxes across countries is complicated, since they may be levied on different products, at different levels and for different purposes. Most recently, Malaysia, for example, has started taxing two categories of beverages in 2019: drinks containing more than 5 grams of added sugar/sweeteners per 100 ml and fruit and vegetable juices containing more than 12 grams of sugar per 100 ml. Comparing sugar taxes across countries is complicated, since they may be levied on different products, at different levels and for different purposes. It is too soon to properly assess and analyse the impact and effectiveness of this new tax.⁵²

Shirin, 16, in her grocery store in Bangladesh. © UNICEF/UN066971/Mawa

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The private sector has tremendous potential to improve children's nutrition

More broadly, a recent published UNICEF review highlights positive effects in several countries on the consumption of taxed products. In Mexico, for example, consumption of taxed beverages decreased by 5.5 per cent in 2014 and 9.7 per cent in 2015,⁵³ while in France the demand for colas decreased by 6.7 per cent and 6.1 per cent in the first two years of implementation.⁵⁴ The Global Nutrition Report 2018 also reported that some observational studies confirm that SSB taxes are achieving positive results.⁵⁵

Labelling and nutrition information

Legislation to place nutrition information on the front of food packages is another policy response that some countries have used. Such labelling lets caregivers and consumers – including children and young people – make informed choices and drives product reformulation. While the evidence continues to build, it suggests that food labelling can help consumers overcome barriers to meeting healthy preferences caused by inadequate information.⁵⁶ The ultimate effect on consumers' behaviour depends on their existing food preferences and level of nutrition knowledge, as well as the type of food. When the label is visible, easy to understand and not misleading, it can positively affect consumer choices. Evidence shows that well-designed labels positively affect all consumers regardless of whether they're rich or poor, and highly educated or not.⁵⁷ Nutritional labelling can potentially create incentives for manufacturers to reformulate their products to make them healthier.⁵⁸

There are several different approaches to food labelling (see *Spotlight 'A pioneering effort in food labelling'*). Systems that enable an easy, evaluative judgement

about a product's healthiness and wholesomeness (or otherwise) appear particularly effective in helping caregivers and consumers choose nutritionally favourable products. For example, colour-coded labels are more effective than plain-text labels in steering consumers toward wholesome foods.⁵⁹ Among the most common, the Multi-Traffic Light (MTL) system is often preferred by consumers for its ease. However, more recent evidence finds that warning labels and summary indicator approaches (e.g. Nutri Score) are more strongly associated with healthier purchases.⁶⁰ Warning labels in particular may be a simpler and more direct way of transmitting important nutritional information to consumers.^{61, 62}

There is a strong case for adopting such labelling. Perhaps as importantly, a recent study across Latin America confirmed that when buying foods for their children, parents do consider front-of-package (FOP) information to compare the nutritional value of products, and they look for systems that are easy to understand and interpret.⁶³

Role of the private sector

The private sector has tremendous potential to improve children's nutrition. Private sector actors – from smallholders to small- and medium-sized enterprises (SMEs), through to multinational food corporations – all have a role to play in transforming the world's increasingly complex global and local food systems. Private sector capacity and actions along the value chain, such as cold storage, improved packaging, fortification and some forms of processing, can reduce nutrient loss, improve food safety and deliver more nutrient-dense foods to families.⁶⁹ This is especially important in low- and middle-income countries,

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SPOTLIGHT

A pioneering effort in food labelling

Faced with a rapid increase in overweight, which affects almost half of its children today, Chile has launched a comprehensive programme to try to improve children's food environments, with the aim of encouraging and supporting children, young people and caregivers to make healthier decisions.

Key initiatives include a National Food and Nutrition Policy, which outlines the right to good-quality, culturally appropriate food that supports good health and well-being.⁶⁴ Other actions include a new and innovative food labelling law that aims to protect children's nutrition by modifying food environments, promoting informed decisions on food, and decreasing consumption of excess sodium, sugar and saturated fats.

The law addresses five main areas: new front of package (FOP) warning labels; restrictions on food advertising, especially that directed towards children aged under 14; incorporation of messages promoting healthy lifestyle habits in food advertising; restrictions on the sale of food

with excess sodium, sugar and saturated fats in schools; and incorporation of activities in all schools that contribute to developing healthy eating habits and an active lifestyle.⁶⁵

The new warning labels have a striking format: white letters on a black octagon, warning consumers that a product is high in calories, sodium, sugar and/or saturated fat (*see below*).

Evaluations of the law and its implementation indicate that the public, especially children, support and easily understand these new messages.⁶⁶ Most consumers take the warning labels on food products seriously and prefer to buy foods with fewer or no labels. Also, the majority of schools comply with the regulations, generating healthier environments without advertising or marketing for inappropriate foods, and the presence of healthier food with critical nutrients, and more spaces for physical activities.⁶⁷ A number of industries have reformulated the composition of their food products in order to stay below the established limits of unhealthy ingredients.⁶⁸ ■

| | |
|-------------------------|---|
| Guideline Daily Amounts | <p>Each 100g serving contains</p> <p>of an adult's guideline daily amount</p> |
| Multi-Traffic Light | <p>Each 100g serving contains</p> <p>of an adult's guideline daily amount</p> |
| Traffic Light | |
| Nutri-Score | <p>Nutri-Score</p> |
| Warning Labels | |

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The failure of the food system to deliver healthy food for children represents a collective failure

where SMEs are numerous, and sanitation and food loss are primary concerns.⁷⁰

In many settings, large private sector players command an increasing share of the market, giving them a tremendous ability to either enhance or reduce the nutritional value of foods. Processing is key to this. The processing of food is not inherently bad – human societies have used it for millennia to improve the safety and nutritional value of food and reduce perishability. However, processing can also remove essential nutrients and add harmful saturated fats, trans-fats, sugar and salt.⁷¹ As noted in Chapter 3, there are reasons to be particularly concerned about the rapid growth in consumption of ultra-processed foods, which, in far too many cases, simply fail to meet the nutritional needs of children.

Commitments and accountability

The failure of the food system to deliver healthy food for children represents a collective failure. Correcting it will require collective action by, among others, governments, families, civil society and the private sector. As the role of large businesses grows in global food systems, there is a need to ensure they play a positive role in promoting nutritious, safe, affordable and sustainable foods and meet their obligations to the world's children and their families.

Engaging with business

Various governance mechanisms have emphasized the need for private sector engagement to promote better nutrition in recent years, and for clearly defined rules of engagement for improving nutritional outcomes for children. As early as 2004, the WHO World Health Assembly endorsed the Global Strategy

on Diet, Physical Activity and Health, which noted that the private sector can be a significant player in promoting healthy diets. It also highlighted the important role of the food industry in reducing the fat, sugar and salt content of processed foods, reviewing marketing practices and introducing healthier and more nutritious choices for consumers.⁷²

In 2015, the United Nations Secretary General launched the Global Strategy for Women's, Children's and Adolescents' Health to strengthen the potential impact of the SDGs. The strategy highlights the importance of the business community in promoting better nutrition and healthier foods.⁷³ The Independent Accountability Panel created to support this strategy, however, recommends that governments regulate the food and beverage industry and adopt a binding global convention to encourage the production of healthier foods, reduce unhealthy content and control the marketing of unhealthy food for children.⁷⁴ Similarly, the Report of the Commission on Ending Childhood Obesity calls for a governance structure in which the private sector is actively engaged and held accountable in the implementation of interventions.⁷⁵

The food industry itself has previously expressed a formal commitment to working towards better diets, nutrition and health outcomes. For example, in May 2018, the International Food Beverage Alliance formally expressed commitment to align with the WHO target to eliminate industrially produced trans-fat from the global food supply by 2023.⁷⁶

Holding food and beverage businesses accountable to their commitments, and monitoring their progress toward stated goals, have proved challenging in the past. For example, previous experience

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in areas such as food marketing to children indicates that the food industry's commitments are patchy, lack ambition and are not always strictly observed.^{77, 78}

Ensuring accountability requires strong coordination between the public and private sectors. Achieving better diets for children is a shared responsibility in which stakeholders not only recognize their responsibility to work for better nutrition for children, but also review current practices that may be blocking progress. Legislation and regulation have an important role, but governments can also provide incentives for businesses to increase the demand for, and to provide healthy food.⁷⁹ Businesses usually prefer the latter approach, and there is evidence that such carrot-and-stick approaches work.⁸⁰

There are numerous challenges to mobilizing action and accountability

from the private sector. Nutritional goals for children and young people compete with vested commercial interests to create strong barriers for significant transformation. A recent *Lancet* study on obesity points out that even though many evidence-based actions and policy recommendations have been identified, they have not translated into meaningful action due to vested commercial interests and insufficient public demand. The Lancet Commission has emphasized the need to reduce the influence of large commercial interests in policy development, allowing governments to implement effective policies.⁸¹

Public and private sectors have the shared responsibility to respond and create new avenues to deliver healthy diets and good nutrition for children: this response must be sustainable and drive profound change in the current system.



A girl at Hua Ngai Primary School, in Muong Cha, Dien Bien, Vietnam holds up a lunch tray she has washed after a nutritious school lunch. © UNICEF/UN043574/Lister

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PERSPECTIVE

The food industry must accelerate action to tackle the global nutrition crisis

Inge Kauer
Executive
Director,
Access to
Nutrition
Foundation

As Executive Director of the Access to Nutrition Foundation, Inge oversees all aspects of ATNF, including collaboration with external partners and stakeholders. She is also member of the board of ATNF. Prior to joining ATNF, Inge was a partner at Boer & Croon, a Dutch-based management consulting firm. She also worked in senior management positions with Porter Novelli, a global, full-service communications agency, and has advised various companies within the food and beverage industry on socially responsible practices and issues of corporate reputation.

What children eat and drink affects their health and well-being in the short and long term. Poor nutrition causes obesity and diet-related diseases at one end of the spectrum, and stunting, wasting and vulnerability to infection at the other. The global nutrition crisis is placing a huge burden on healthcare services and threatening the achievement of the UN's Sustainable Development Goals. The private sector can make a pivotal contribution to addressing this global problem.

Food and beverage (F&B) manufacturers have a huge influence on the diets of consumers. As incomes rise, so consumers tend to eat and drink more packaged foods and beverages. This is driving growth in the F&B industry, particularly in emerging markets, where economic growth has been almost five times faster than in mature markets. The 22 largest F&B manufacturers worldwide assessed in the 2018 Global Access to Nutrition Index operate in over 200 countries and generate approximately US\$500 billion in sales.

At the Access to Nutrition Foundation (ATNF), we believe that these companies have a vital role to play in addressing the world's nutrition challenges and the

diseases caused by poor diets. Moreover, ATNF is convinced that companies that adopt comprehensive global nutrition strategies will perform better in the long term.

The Global Access to Nutrition Index is designed to track the contribution being made by F&B manufacturers to addressing global nutrition challenges and to encourage them to do more.

We see evidence of impact: since the 2016 assessment, many companies have stepped up their efforts to encourage better diets, largely through better policies and disclosure of information. Some have also increased efforts to address undernutrition, either philanthropically or through their core business, by, for example, fortifying certain foods.

While the results of the 2018 Global Index are heartening, they also show that much more progress still needs to be made. The average score overall, although still quite low, rose from 2.5 to 3.3 out of 10, and nine companies scored 5 or more, compared with only two in 2016. Even so, the 2018 Index shows there is still considerable room for improvement in the nutritional quality of companies' products.

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The Product Profile, which assessed the healthiness of companies' products in nine countries, revealed that less than one-third of the 23,000 products surveyed can be classified as healthy.

If we zoom in on what companies are doing to ensure good nutrition for children, the 2018 Index raises some specific concerns. Only 14 per cent of the products meet the WHO's European Region dietary guidelines for marketing to children. None of the companies' portfolios comprises more than 50 per cent of products that meet the healthy standard suitable to be marketed to children. Furthermore, most companies' policies on responsible marketing to children still fall short. For example, they do not cover all media, including digital, nor apply to children over the age of 13. Only one company extends its policy on responsible marketing to 18-year-olds, which is considered best practice. The 2018 Index recommends companies stop on- and offline marketing of products to children that do not meet WHO recommendations.

The marketing of breastmilk substitutes is another area where companies need to take action. Companies publicly state their adherence to the International Code of Marketing of Breast-milk

Substitutes and a few companies have strengthened their policies in response to the 2016 Index, but the 2018 Global Index found that all baby food companies that we assessed continue to contravene its guidance. Our in-depth research in Thailand and Nigeria, for example, found a high incidence of non-compliance with the code, mostly through point-of-sale promotions offered by major online retailers. Baby food companies must ensure that their marketing policies align fully with the code, are applied completely and consistently around the world – in developing as well as developed countries – and to all products, including toddler milks. Companies can also support breastfeeding mothers in their workplaces by offering flexible and supportive working arrangements, stronger maternity leave arrangements and appropriate facilities to express and store breastmilk.

To support good nutrition for children, food companies need to step up their efforts to market healthy products and make more products suitable for consumption by children. Only then can they fulfil the enormous potential they have to contribute to the aims of ending hunger and promoting healthy lives that are incorporated within the Sustainable Development Goals. ■

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Interventions to promote healthy eating and lifestyles are more effective and sustainable when they encourage community engagement

Civil society and community responses

Local communities and civil society organizations (CSOs) can play a significant role in promoting better child nutrition, including by representing the voices of marginalized groups (such as smallholders, indigenous children, and women), holding government and business accountable, and directly serving the nutritional needs of their communities.^{82, 83}

Specifically, four key roles for CSOs were identified by *The Lancet* series on Maternal and Child Nutrition (2013):

- They can advocate nationally and globally for nutritional priorities and actions.
- They can ensure accountability for the coverage and quality of nutrition services (similar to health services or education services).
- They can generate context-specific knowledge on the causes of malnutrition and possible solutions.
- They can implement nutritional programmes and platforms for delivery.⁸⁴

One concern over the role of CSOs is the evidence that, in some cases, special interest groups have been founded to set up false CSOs – a practice called ‘astroturfing’. These groups present the appearance of a grassroots effort that supports corporate agendas, for example by challenging soda taxes.⁸⁵

Top-down and bottom-up change

Community-based responses to malnutrition are either top down or bottom up. In a top-down response, local groups are mobilized to implement community-based interventions, such as education and behaviour change campaigns, and emergency responses. In many cases, these interventions are planned and designed at a national level, but their implementation by local groups enhances their legitimacy and transparency. There is evidence to suggest that interventions to promote healthy eating and lifestyles are more effective and sustainable when they encourage community engagement and consider the specificities of the local context.⁸⁶

Bottom-up responses can include advocacy by grassroots CSOs for systemic and fundamental change to the food system. Among the causes taken up by grassroots CSOs are hunger and malnutrition, particularly in children, soil and water conservation, food-waste reduction, the right to food, local food production, urban agriculture, regulation of genetically modified organisms, reform of trade practices, and the rights of youth, women and indigenous peoples. In the global south, ‘food sovereignty’ has emerged as a key issue for grassroots CSOs. Its core principle is that “communities have the right to define their own food and agriculture policy.”⁸⁷

Numerous other grassroots CSOs and social movements are working to reform the food system and improve nutrition. For example, the Pakistan Fisherfolk Forum promotes the rights and empowerment of fishing communities and works to protect their livelihoods

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SPOTLIGHT

Surviving and thriving in Peru

When they were born in 2000 in the Hanaq Chuquibamba community, located in the Peruvian Andes, Josué Abdías and Josué Abraham were both undernourished. Today, the twins are healthy adolescents and both are preparing to go to university. The twins' turnaround mirrors Peru's broader success in combating undernutrition. In 2000, almost one in three children in Peru was stunted; today, thanks in part to interventions such as the Good Start Programme⁹⁵, from which the twins benefited, the prevalence is just 12.9 per cent.

Peru's success in fighting undernutrition reflects a determined national political effort, coordination between sectors, and an effective results-based budgeting and monitoring system. Community leadership has also been key. In Hanaq Chuquibamba, local leader and father of the twins, Igidio Sataraura, emphasized the centrality of the community's

work to monitor children's nutritional status, ensure access to health and nutrition services, and disseminate knowledge about feeding and other caring practices.

However, Peru's fight against malnutrition is not over. There is concern over the continuing prevalence of forms of hidden hunger, particularly iron deficiency anaemia, and, increasingly, overweight. A stakeholder consultation organized by UNICEF Peru in November 2018 brought together government representatives, academia and CSOs to reflect on strategies to continue the fight against all forms of malnutrition. Participants recognized the new challenges posed by persistent undernutrition and rising overweight and emphasized the role of the public sector in coordinating policies, strategies and programmes, as well as the need for continued inter-sectoral coordination and adequate funding. ■

Josué Abdías and Josué Abraham with their parents in the Hanaq Chuquibamba community in Peru. © UNICEF/Vilca 2019



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through sustainable fishing policies and practices.⁸⁸ The Movimento dos Trabalhadores Rurais Sem Terra (MST; ‘Landless Workers Movement’) is the largest social movement in Latin America. It has worked for over 30 years for the principles of agrarian reform and food sovereignty in Brazil.⁸⁹ Local CSOs are working for reform in modern food systems in high-income countries as well. In the UK, for example, CSOs have been successful in promoting Fair Trade, organic certification, ecological approaches, permaculture, and local and slow food movements.⁹⁰

CSOs can play a key role in promoting nutrition in non-food systems too. For example, in the education system, CSOs may shape policy around obesogenic school environments, school feeding and nutrition education. In the social protection sector, they may work to ensure that children from marginalized communities receive essential services. CSOs have also advocated for community-led plans for improved water and sanitation.

Despite their potential to contribute to improving children’s nutrition, CSOs have encountered difficulties in participating in policy formulation and have enjoyed relatively little success in holding governments and the private sector to account.^{91, 92} Nevertheless, there are instances of where CSOs have been included in

national and international dialogues to shape nutritional priorities and policies. The SUN Movement includes a Civil Society Network of over 2,000 local member organizations, to foster alliances and promote nutrition actions in SUN member countries.⁹³ The UN Committee on World Food Security also has a civil society mechanism that provides an inclusive space to ensure civil society is represented in wider policy debates.⁹⁴

Conclusion

The evidence in this chapter is clear: all over the world, there are countless examples of initiatives both big and small that are helping to improve children’s nutrition. However, as the continuing toll of stunting, wasting and hidden hunger, and the rising toll of overweight, also make clear, much remains to be done. If we are to meet the malnutrition challenge full on, we need a scaled-up approach that puts children’s nutritional rights at the heart of food systems and prioritizes nutrition outcomes in other key systems. The next, and final, chapter of this report identifies how this can be done by identifying five key principles to mobilize government, business and civil society to transform children’s nutrition in the 21st century. ■

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SPECIAL SECTION

Influence of food marketing on children's diets

Far from being a matter of simple personal preference, individual food choices and eating habits are largely influenced by the food environment – a mix of factors that includes food availability, accessibility, affordability and preference. **One important influence in the food environment on consumer behaviour and a child's diet is food marketing.**

Across high-, middle- and low-income countries, children are becoming increasingly subjected to ubiquitous marketing strategies that have a powerful effect. Advertisements, food packaging that attracts children and digital campaigns all stimulate a preference for, and consumption of unhealthy food – particularly fast food, ultra-processed foods high in salt, sugar and/or fat, and sugar-sweetened beverages. All these conspire to increase the risk of overweight among children.

According to the WHO Commission on Ending Childhood Obesity (the ECHO Commission), food marketing is directly linked to growing overweight and obesity and related harms to children's health and nutrition: "There is unequivocal evidence that the marketing of unhealthy foods and sugar-sweetened beverages is related to childhood obesity."⁹⁶ For example, a survey of Australian children aged 10–16 showed that those who engaged with more food content online, especially video ads, were more likely to consume unhealthy food.⁹⁷ Several other systematic reviews have determined the extent, nature and impact of food marketing on children and subsequent reviews have reaffirmed these findings.⁹⁸

Efforts by governments and civil society to promote healthy diets in high-income countries face a steep challenge. The marketing of unhealthy food outstrips spending on healthier food or healthy food promotion in North America and Western Europe. In 2012, the amount spent on fast-food advertising in the United States was over 12 times the total spent on milk, water, vegetables and fruit combined.⁹⁹ In the UK, unhealthy food advertis-

ing spending is 30 times greater than spending by the government on healthy eating habits.¹⁰⁰ A recent study conducted across 22 countries found that for every one advert for healthy foods, there were four promoting foods high in fats, sugar and salt – and marketing of these unhealthy products was most frequent during children's peak viewing time.¹⁰¹ Globally, children are exposed to a huge volume of marketing for unhealthy foods and beverages, despite the implementation of self-regulatory initiatives by industry.

In-store marketing (*retail marketing*) also represents a major threat to children. A recent study in Mexico shows that in-store techniques are used with the specific aim of attracting children to unhealthy foods, including, for example, the placement of products at children's eye-level, promotions with prizes, and the use of licensed movie and cartoon characters.¹⁰²

Lower-income countries represent an unprecedented opportunity to the manufacturers and marketers of ultra-processed foods, fast food and sugar-sweetened beverages. From 2011 to 2016, fast-food sales grew by 254 per cent in Argentina, 113 per cent in India, 83 per cent in Viet Nam and 64 per cent in Egypt.¹⁰³ Digital marketing is both more effective and pervasive than traditional methods using TV and print, raising concerns about the effects of food marketing. An analysis in Europe found that combining online marketing with other media increased the returns on TV and cinema advertising by around 70 per cent.¹⁰⁴ Globally, one in three internet users is estimated to be a child. In less developed countries, the internet



Aleksa, 8, and Kosta, 12, play games on their mobile phones in Belgrade, Serbia. Digital media magnify the reach and impact of marketing unhealthy foods to children. © UNICEF/UN040855/Bicanski

is often predominantly accessed through smart-phones, giving food marketers a channel for advertising that is available to children almost all of the time.¹⁰⁵

There are psychological, technical and structural reasons why digital media multiplies the channels for marketing, magnifying its reach and impact. First, digital media allows for ‘micro-targeting’ of marketing messages, reaching those most vulnerable. Second, digital media allows for ever-evolving, novel and creative approaches such as games, and peer photo- and video-sharing that creates immersive, engaging techniques that magnify their appeal. Third, invasive, immersive, entertaining, high-engaging and data-driven techniques are widely shared by children with their peers.

In response to the growing influence of food marketing, in May 2010, the 63rd World Health Assembly

unanimously endorsed the WHO recommendations on the marketing of foods and non-alcoholic beverages to children.¹⁰⁶ WHO urges Member States to restrict the marketing of unhealthy food to children, to promote better nutrition, and to contribute to the commitments to end childhood obesity. As opposed to voluntary self-regulation by the food industry, WHO recommends legally binding rules through legislation.

A recent study evaluated food marketing policies and sales in 79 countries. Assessing regulations in force up to 2014, and food sales between 2002 and 2016, it found that unhealthy food sales increased where countries did not have unhealthy food marketing regulations, whereas unhealthy food sales reduced after such policies were implemented. Notably, countries with industry self-regulation policies also saw an increase in unhealthy food sales, whereas sales decreased where regulation was statutory.¹⁰⁷ ■



PERSPECTIVE

Grassroots activism in Mexico battles childhood obesity

Alejandro Calvillo Unna
Director General,
El Poder del
Consumidor,
Mexico

An epidemic of childhood obesity is sweeping the world. Consensus in the scientific community and among international organizations points to the mass introduction of ultra-processed food and sugar-sweetened beverages (SSBs) into our diets as the main reason. Yet scientific data revealing the damage to health caused by ultra-processed foods and recommendations by the World Health Organization (WHO) to reduce consumption of these products have been vigorously contested by major multinational food and beverage corporations.

Non-profit organizations play a vital role in encouraging policies that take on these powerful forces to battle the global obesity epidemic. Academic institutions that generate research and evidence often do not have a prominent impact on influencing public policy. Research is published in scientific journals and often remains hidden from the legislative sphere. An alliance between academia and civil society can unlock change, with the latter lobbying for public policies based on evidence generated by the former.

Non-profit organizations that fight for public health policies to combat obesity and regulations to create healthier environments for children are crucial for building discussion in the media and generating public opinion that is favourable to anti-obesity policies.

Public campaigns, while lacking the vast funding that goes into advertising junk food and SSBs, provide information capable of generating a shift in public awareness and a sense of urgency to act to protect health, especially for children.

In Mexico, we created a simple campaign in 2013 to show how much sugar there was in a single 600-ml bottle of SSB, the most popular container size. As of 2011, Mexico was the world's largest consumer of SSBs. The campaign presented the viewer with two images. In one ad, the caption read: "Would you drink 12 spoonfuls of sugar? Soda is sweet, diabetes isn't." In the second ad, which showed an adult hand offering a soft drink to a boy and a girl, the text read: "Would you give them 12 spoonfuls of sugar? Why do you give them soda?" With billboards on the street and advertising in city metro stations, the information had a strong impact on a population that had no idea how much sugar these beverages contained.

The campaign, which was accompanied by data on the growing consumption of SSBs and the rising number of diabetes-related deaths enabled us to present a proposal on levying a tax on these drinks. In 2014, we succeeded in having a special tax of about 10 per cent imposed on SSBs as part of Mexico's federal tax reform.

Alejandro Calvillo Unna was part of the group that founded Greenpeace Mexico. He worked for 12 years at Greenpeace, with five of those as Executive Director. He founded the Mexican civil society association El Poder del Consumidor (EPC) ('Consumer Power') in 2006, where he serves as Director. EPC has been a central actor in obtaining a soda tax, mandatory regulation of food and beverages in schools, and the implementation of a regulation on marketing that targets children. Alejandro is a member of The Lancet Commission on Obesity and has contributed to the WHO's advisory groups.

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The demand for extra taxes on SSBs has been accompanied by a proposal for regulations to change the obesogenic environment for children, such as banning unhealthy food and beverage advertising to children and removing these products from schools. In 2014, we successfully advocated for legislation making school food and beverage guidelines mandatory, although the political will needed to enforce them has been lacking. Laws prohibit the advertising of these products to children on television and movies during certain hours and require food and beverage containers to bear front-of-pack (FOP) labels.

However, these regulations are developed by an institution with a profound conflict of interest, and are influenced by the interests of the food industry. Thus, the FOP label, designed by the industry itself, is hard for consumers to understand, and the sugar criterion it recommends is actually a risk to health. Regulations on advertising to children are, in practice, a simulation: they do not cover the shows and times that children watch the most TV, and nor do they control advertising on the street, on the internet or other media, or the use of gifts and promotions that encourage children to consume unhealthy products.

In response, we filed multiple cases against the FOP label. Two of these cases were ruled in our favour, establishing that the FOP label was a violation to the right to healthy food, information and the best interests of the child. In parallel, the scientific community proposed a FOP warning label for unhealthy foods and beverages that clearly alerts the consumer if a product is high in sugar, fats or sodium.

We also conducted a study to show that Mexican schools remain obesogenic environments, that the guidelines are not enforced, and that educational authorities must fulfil their obligation to guarantee a healthy environment for children.

In some cases, such as in Chile, health authorities and legislators committed to the common good have pushed policies to battle the obesity epidemic without broad-based movement from civil society. However, in most cases, the actions of these organizations remain crucial in driving change. The partnership between civil society and academia requires a third partner who is essential to achieving the common goal – legislators and public officials who are committed to public health and who are willing to face down the powerful vested interests that stand in their way. ■

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Some innovations in nutrition

NEW AND IMPROVED DIGITAL HEIGHT BOARDS

Collecting accurate data on young children's height is challenging. A new digital height board, designed for children's comfort and to yield more precise measurements, is now being tested. Improved estimates will provide governments and practitioners with a better understanding of the rate at which children are growing. © UNICEF, 2019



BETTER TASTING THERAPEUTIC FOOD FOR CHILDREN IN CAMBODIA

One in three children under five in Cambodia is stunted or underweight, but only 6 per cent of children suffering from severe acute malnutrition receive treatment. To make therapeutic food more appealing and less expensive than imported milk-based products, the Cambodian Government's Department of Fisheries, France's Institut de Recherche pour le Développement and UNICEF developed Nutrix. Filled with micronutrients and designed to appeal to Cambodian children in taste, it is locally produced and made from fish, rice and beans.

A NEW APPROACH TO PREVENTING CHILDHOOD OBESITY THROUGH AN INNOVATIVE PARTNERSHIP

Any parent knows how difficult it can be to get children to eat healthy food. In 2018, Beko, the leading home appliance brand in Europe, launched #EatLikeAPro, a global initiative to help families encourage their children to eat better and prevent childhood obesity. Beko enlisted the help of star players from its partner FC Barcelona to share the stars' favourite healthy eating stories and recipes on the #EatLikeAPro website to inspire parents to prepare healthier meals for their children. The campaign captured worldwide attention, generating 28 million views with a reach of over 140 million people.

To amplify global awareness about the importance of healthy eating and introduce on-the-ground impact, Beko joined forces with UNICEF, which has been working with FC Barcelona since 2006 to promote children's rights and education through sport. To raise funds, Beko and FC Barcelona took advantage of the more than 650 million viewers of an El Clasico match and launched the #EatLikeAPro hashtag-sharing campaign. For every hashtag used, Beko donated 1 euro to UNICEF. The fund reached 1 million euros in 11 days, with hashtag shares taking place in 167 countries. The funds are being used to support UNICEF programmes in six Latin American countries to address the root causes of the emerging overweight and obesity epidemic.



© Marc Ensenyat

In May 2019, with UNICEF's technical input and FC Barcelona and Barça Foundation collaboration, Beko surveyed over 13,500 children between the ages of 6 and 10 in 18 countries, to find out whether they would eat healthier food if they knew their hero or role model did. An overwhelming 80 per cent of the children said they would. The consequent #EatLikeAPro online campaign features FC Barcelona player Gerard Piqué promoting healthy eating to primary-school children. The campaign registered over 15 million views in its first month.* Through this unique tripartite partnership, #EatLikeAPro has developed into an award-winning social campaign with global reach and importance.

*Social monitoring statistics supplied by Beko.

USING AI-DRIVEN PHOTOGRAPHY TO DETERMINE MALNUTRITION

The traditional approach of measuring a child's upper-arm circumference and weight-height ratio requires time, equipment and trained staff. Using new facial recognition and machine learning technologies, the Method for Extremely Rapid Observation of Nutritional Status assesses malnutrition in children aged 6–59 months in emergency settings without human assessment – or error. The algorithm estimates body mass index (BMI) by analysing a digital image of the child. (For their safety, the actual image is not stored.) This rapid and less intrusive tool is intended to complement rather than replace other measurements.



© Kimetrica

WHAT'S IN THIS? SCAN THE BARCODE AND FIND OUT

From Australia to India to France, customers are using their smartphones to scan barcodes on packaged foods to find out how much sugar, salt and fat they contain. Nutritional information collected through the FoodSwitch app for over 34,000 packaged foods was used to improve Australia's Health Star Rating food labelling system for sugary packaged foods. In India, FoodSwitch was used to evaluate the healthiness of the packaged foods sold by the largest food manufacturers.

Open Food Facts, an open-source platform that has nutritional information on over 75,000 products, entered by volunteers in 150 countries, was used by the French National Nutrition and Health Programme to validate its nutrition grading scoring. These consumer-generated databases are proving to be a more cost-effective alternative to purchasing data from market research companies.

A DATA-DRIVEN RESPONSE TO THE TRIPLE BURDEN IN INDIA

India's Comprehensive National Nutrition Survey (CNNS), which ran from 2016 to 2018 across all states, was the biggest ever nationwide effort to paint a detailed picture of the nutritional status of pre-schoolers, school-age children and adolescents up to 19 years old.

For the first time, the extent and severity of micronutrient deficiencies, information on fat distribution and nutritional risk factors for non-communicable diseases (NCDs) and links between children's nutritional status and their cognitive development were assessed in a single survey. As well as being unprecedented in scale, the CNNS used innovative data quality assurance measures, including SMS-based monitoring and gold-standard methods for biological sample collection and laboratory testing.

Notable findings from the survey, which was made possible through a philanthropic partnership with Megha and Aditya Mittal, included seasonal variations in vitamin A deficiency, a large disparity in anaemia prevalence between girls and boys, and evidence that overweight and obesity, as well as the threat of diabetes, are on the rise among school-age children.



© UNICEF/UN052963/Matta

These findings have informed India's ambitious child nutrition programmes. They also provide the basis for potential new policy recommendations, including scaling up dietary diversification and food fortification to address vitamin A deficiency, tackling the triple burden of malnutrition and starting programmes in the early years to instil healthy lifelong eating habits.



05 AN AGENDA TO PUT CHILDREN'S NUTRITION RIGHTS FIRST

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One word must be at the heart of our response to children's malnutrition – action. We need action that reflects the core role of food systems, that strengthens the supply of – and demand for – better food, that improves children's food environments, and that reflects the role of key supportive systems: health, water and sanitation, education and social protection. With action comes another imperative: accountability. Progress must be measured, shared, acted on and celebrated.

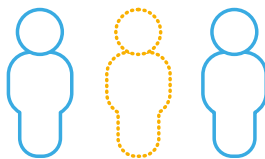


These five key responses are essential to improve children's nutrition:

- Empower families, children and young people to demand nutritious food
- Drive food suppliers to do the right thing for children
- Build healthy food environments for all children
- Mobilize supportive systems to scale up nutrition results for all children
- Collect, analyse and use good-quality data and evidence regularly to guide action and track progress

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Put children’s nutrition first

1 in 3 children
is not growing wellFor every child
to grow well

1

Empower families, children and young people to demand nutritious food



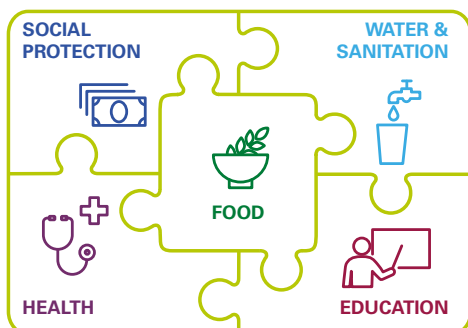
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Drive food suppliers to do the right thing for children



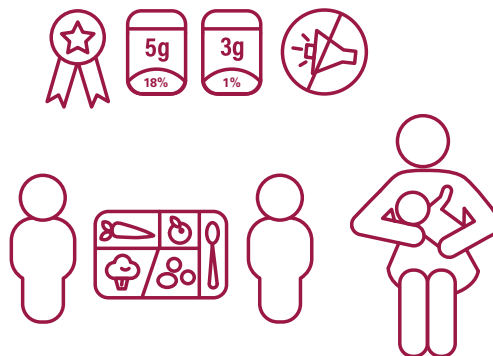
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Mobilize supportive systems to scale up nutrition results for all children



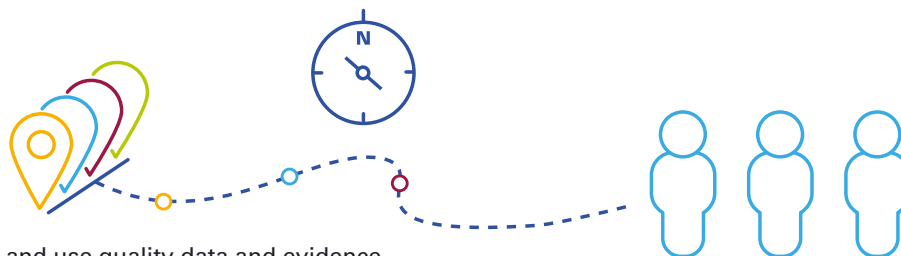
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Build healthy food environments for all children



5

Collect, analyse and use quality data and evidence regularly to guide action and track progress



Introduction

Nutrition is a basic building block in a child's life. Every aspect of childhood – from development in the womb, to playing and exploring in infancy and early childhood, and from learning in school, to preparing for adulthood and employment – is built on a foundation of good nutrition. For those suffering from malnutrition, every challenge in life becomes more difficult and every opportunity harder to grasp. Amid growing concern about how the world is feeding itself, this report proposes an agenda for every child to eat well.

This report began by defining malnutrition as “lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things, or being unable to use the food that one does eat.” Globally, one in three children under 5 is not growing well because of malnutrition and two in three are at risk of malnutrition because of the poor quality of their diets.

The nature of malnutrition is also evolving as family diets become determined by ever more globalized and commercialized food systems. Food systems are failing children and urgent transformation is needed. Children's unique nutritional needs during the various stages of life must be at the heart of the food system transformation and a priority for all actors involved in the provision of nutritious, affordable, safe and sustainable diets.

This report comes at a time of concern not only about the ability of the world to produce enough nutritious food for everyone, but also about its capacity to do so sustainably in ways that protect the planet. This report is unique in its call to put children first, at the centre

of the world's food and nutrition challenge. However, amid this wave of interest, we would do well to remember a proverb from Nigeria: Fine words do not produce food. Words aren't enough. Our response to children's malnutrition must be grounded in action.

First, our response must recognize the right of children to food and nutrition as a human right. Thirty years ago, with the signing of the Convention on the Rights of the Child, world leaders came together to commit to the right of every child to enjoy a full childhood. Still today, far too many children are robbed of their present and their future because of malnutrition. UNICEF calls on all actors to put children first and combat malnutrition by recommitting to the right of all children – without exception – to food and nutrition as a human right.

Second, women and children's well-being must be at the heart of government policy. When it comes to ensuring healthy diets, governments have a critical role to play through policy, regulation, quality assurance and effective programmes. These commitments – and the financial investments associated with them – should be grounded in evidence and linked to a set of clear targets and accountability metrics for each stakeholder. Progress towards food and nutrition targets should be regularly tracked, shared, acted on and celebrated.

Third, putting children at the centre of food systems requires a multi-pronged approach: stimulating demand for healthy options, strengthening the supply of nutritious foods, and improving children's food environments. Experiences from

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Dr. Pakirova prepares dinner for her family in Kyrgyzstan's Chon Alai district.
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an increasing number of countries provide examples of what works, but better data and evidence are needed to monitor performance, document lessons and improve actions at scale.

Finally, our response must go beyond the food system itself and be supported through the efforts of other systems. We have seen how four systems – health, water and sanitation, education, and social protection – can work together with the food system to support children’s nutrition in diverse contexts. It’s time to

enhance these interventions to scale up the impact for nutrition. The importance of nutrition to children’s development and well-being, and the growth and development of national economies and human capital, mean that we must put nutrition at the core of how we address wider challenges such as in health, education, poverty reduction and equity.

To guide the response to children’s malnutrition, this report proposes the following **Agenda to Put Children’s Nutrition Rights First**.

1 | Empower families, children and young people to demand nutritious food

Demand affects supply because food producers respond to consumer behaviours and aspirations. When healthy options are affordable, convenient and desirable, parents and caregivers make better food choices for children. As children grow older, they make more food choices, so knowledge and information can make them powerful agents of change. Stimulating demand for nutritious foods means not only educating consumers on the benefits of a healthy diet, but also leveraging cultural and social aspirations to change behaviours and practices.

- **Understand and leverage family and community dynamics.** Family and community dynamics, including intrahousehold distribution and the utilization of foods, can vary greatly. Evidence consistently shows that when women have more education, decision-making power and control over the household's income, they tend to choose healthier foods and feeding practices for their children. One area of constraint is that food preparers in households can lack the skills to create meals that meet the nutritional needs of children. It is also important to engage fathers and the extended family to support women's multiple roles, especially women in the formal and informal workforces.
- **Improve nutrition education to enable better lifelong dietary habits.** Nutrition education starts at home, continues in school, and should be reinforced by public communication campaigns. It should also be incorporated in

the health and social protection systems. Parents need to be educated about nutritious foods and healthy feeding practices for their children and the risks of over-consumption of unhealthy foods. Education should extend beyond the benefits of healthy foods to behaviour change and empowerment, especially for school-age children and adolescents, who are themselves agents of change.

- **Improve the desirability of healthy foods.** Innovative, fun, memorable and engaging communication strategies to promote healthy eating – including but not limited to campaigns – can leverage the social and cultural aspirations of children, adolescents and parents. These strategies should capture parents' interests and aspirations, such as physical growth, brain development and school performance, as well as the interests and aspirations of school-age children and adolescents, such as sport, appearance, strength, pop culture, social media and more.
- **Use proven legislation to reduce demand for unhealthy foods.** In certain circumstances, specific taxes on unhealthy foods, such as sugar-sweetened beverages, can reduce demand for these products by making them relatively more expensive than healthier alternatives. Combined with nutritional education, these tools have proved effective drivers towards more nutritious diets for children. ■

2 | Drive food suppliers to do the right thing for children

It’s not enough that children and families demand healthy food – it must also be available, affordable, safe and convenient. Food producers and suppliers have a key role to play, and governments can set standards to create a level playing field for all producers and suppliers, ensuring that their actions align with children’s best interests. Food systems are diverse, and so are the solutions. In non-industrialized food systems, for example, smallholders can be supported to raise their productivity; in industrialized food systems, stronger market linkages and incentive structures can improve the availability and affordability of fresh and healthy foods. All food systems need to move towards environmentally sustainable production and consumption to protect children’s nutrition today and in future generations.

- **Provide economic incentives, and eliminate disincentives, for producers to supply more nutritious children’s foods.** Policymakers can incentivize food producers to supply nutritious, safe and affordable foods to children while eliminating subsidies for sugar, refined grains and processed oils. As the complementary feeding period (6–23 months) is particularly important for children’s growth and development, food producers should be discouraged from marketing nutrient-poor, sugar-rich and highly processed foods as suitable for this age group. Incentives should also seek to increase the proportion of fresh fruits and vegetables available at markets, supermarkets and other points of sale, especially in low-income communities and food deserts. Business-friendly policies, such as reduced rents,

tariffs and utilities, can be used to reward companies that produce and market healthy foods.

- **Invest in the modernization of infrastructure and transport chains to reduce food and nutrient losses and improve food safety, especially in rural areas.** Many of the foods that children need most, including fruits, vegetables, and foods of animal origin such as fish, eggs, milk and dairy, are also highly perishable. Where infrastructure is poor, much is lost to spoilage and contamination, driving up the price and reducing availability and affordability. Children’s diets often then turn to highly processed foods, which are less expensive and have a longer shelf-life. Investments by the food industry and governments in storage, packaging, processing, cold-chain logistics and other infrastructure to bring healthy foods to market can reduce both the costs to producers and the prices faced by families.
- **Strengthen policies, strategies and programmes to enhance the resilience of the food supply in crisis-prone areas and fragile contexts.** In humanitarian settings, children always suffer the most. Appropriately formulated, ready-to-prepare fortified complementary foods have a critical role to play in supporting optimal growth and development in infants and young children, as do ready-to-use therapeutic foods (RUTF) for the treatment of acute malnutrition in children. Governments of crisis-hit areas should ensure that such foods are readily available through

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either facilitating local production or removing barriers to import. Investment in well-designed social protection programmes can ensure that women and children living in vulnerable households have access to more nutritious and diverse diets.

- **Reduce the environmental impact of food production for today's and tomorrow's children.** There are clear linkages between food production and consumption, environmental sustainability, and the impact on

children's nutrition and health. Robust interventions are needed to reduce the environmental impact of food production and consumption in ways that evidence shows are harmful to children, including greenhouse gas emissions, fossil fuel use, pesticide use and fertilizer run-off. Production systems such as agroecology, agroforestry, intercropping and integrated crop-livestock management can enhance the sustainability and biodiversity of food systems for generations to come. ■

3 | Build healthy food environments for all children

The personal and external food environments are where children and their caregivers interact with the food system. While the forces of supply and demand shape food environments, context-appropriate actions such as protection against exploitative marketing and mandatory labelling can help create food environments that are conducive to nutritious diets for children.

- **Create environments conducive to healthy breastfeeding and complementary feeding practices.** Strictly enforce the International Code of Marketing of Breast-milk Substitutes and hold violators accountable. Promote supportive policies for mothers, parents and families, including maternity leave and the provision of time and spaces for breastfeeding in the workplace and in public places. Stimulate the availability, accessibility and affordability of easy-to-prepare complementary

foods at points of sale, particularly in low- and middle-income countries.

- **Enhance the transparency of nutritional information through front-of-package food labelling.** Governments should mandate front-of-package food labelling, especially for foods that are marketed to children or marketed as suitable for children. Labelling can raise awareness of the nutritional value of foods, promote behaviour change among parents, adolescents and children, and stimulate businesses to work towards product transformation by adding healthier ingredients and removing unhealthy ingredients. To be effective, such labels need to be prominent and instantly readable. Quality seals and similar highly visible certifications can also be awarded to vendors that provide healthy options and food choices for children.

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- **Regulate the marketing of unhealthy foods to children.**
Children everywhere should be protected against the impact of harmful and exploitative marketing and advertising of unhealthy foods. Regulations should target advertising on television, and in games, movies, books and social media for all age groups, as well as businesses and restaurants that give away toys to market unhealthy foods.
- **Reduce obesogenic influences around places designed for children, particularly schools.**

For many children, schools provide their first regularly consumed meals outside the home. Governments and ministries of education need to take steps to combat obesogenic food environments, including ensuring that school meals are nutritious and diverse, limiting the sale and advertising of sugar-sweetened beverages and foods high in unhealthy fats, sugar and salt in proximity to schools and playgrounds, and ensuring that adequate time during the school day is set aside for active play in safe recreational spaces. ■

4 | Mobilize supportive systems to scale up nutrition results for all children

While the food system is a critical pillar for the provision of healthy diets for children, four other key systems must be mobilized to deliver nutrition services, improve nutrition practices and achieve nutrition outcomes at scale. In addition to the food system, the health, water and sanitation, education and social protection systems must all deliver interventions in a coordinated fashion. A systems approach ensures that children and families have access to healthy diets and receive the nutrition services children need to grow and develop to their full potential.

- **The health system.** Actions need to be integrated into the health system to ensure that children survive, grow and

develop to their full potential. Investment in the nutritional knowledge and skills of health workers, the frontline between the health system and families, is particularly important. Preventive care against malnutrition, such as early initiation of breastfeeding, counselling and support for exclusive breastfeeding, complementary feeding and maternal nutrition, are essential services that should be delivered during pre- and post-natal healthcare visits. Screening and treatment for anaemia, vitamin A deficiency, growth failure and excessive weight gain also require health system skills, support and supplies. Finally, given the high mortality risk associated with wasting, governments

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should systematically integrate into routine services the early detection and treatment of children with life-threatening wasting.

- **The water and sanitation system.** The water and sanitation system is critical to ensuring children have access to safe drinking water and safe sanitation. Such access is essential to ensure a healthy diet, protect children from infection and enteropathy to ensure their bodies can utilize nutrients, and to prevent stunting, wasting and other forms of malnutrition. Governments should support the construction of improved latrines and reduce the distance that women and children must travel to access safe drinking water and toilets. While investments in infrastructure are important, behaviour change communication for optimal feeding, safe food handling and handwashing with soap at critical times should be mainstreamed in communities and schools, targeting parents and children from a young age.
- **The education system.** The education system can deliver a number of nutrition interventions to support healthy diets and good nutrition for children and adolescents. In both formal and informal education settings, nutrition education from as early an age as possible should ensure that children and their caregivers are empowered to make healthy food choices. Schools should create healthy food environments for children and adolescents,

which includes ensuring the availability of safe drinking water and limiting the availability of obesogenic influences within schools and school zones. In some contexts, school feeding programmes may be useful in providing nutritious meals to vulnerable children. The education system can play a key role in the delivery of integrated programmes for the prevention of iron deficiency and anaemia through the provision of micronutrient supplements, deworming prophylaxis and counselling on healthy eating, for example.

- **The social protection system.** The social protection system forms a crucial safety net to protect the nutrition and well-being of children and women from the most vulnerable families in society and those suffering from social exclusion and poverty. In a direct way, the social protection system can ensure children's access to nutritious and diverse diets through food transfers, food vouchers or cash transfers. Social protection programmes can also secure access to nutrition services through the health system, such as pre- and post-natal care and nutritional counselling to mothers (including those of malnourished children) and through the education system using school-feeding vouchers, for example. In addition, the social protection system is essential to support children's and households' food security by preventing the depletion of productive assets in emergencies, such as livestock and seeds.

5 | Collect, analyse and use good-quality data and evidence regularly to guide action and track progress

Accurate and timely data are required to understand the malnutrition problem, to take coordinated, evidence-based action, and to hold all actors – public and private – to account. Yet the scarcity of data remains a major barrier that is preventing governments from responding with effective policies, strategies and programmes. Data collection methods and frequency must be transformed to expand what we know about the diets and nutrition of children, adolescents and women across the lifecycle, extending beyond the traditional focus on the first 1,000 days. Action to improve malnutrition requires responsive data systems and a culture of data-sharing and transparency.

➤ **Set targets for, and track progress on, complementary feeding for infants and young children.**

It is vital to address the absence of global targets for improving the diets of children and feeding practices in the crucial complementary feeding period. Global and national targets for continued breastfeeding, complementary feeding and healthy diets should be set. These targets should use standardized indicators that can be regularly collected in national nutrition data and information systems and surveys. Indicators and targets should focus on improving positive practices, such as increasing the consumption of fruits and vegetables and achieving minimum dietary diversity, as well as reducing negative behaviours such as the consumption of ultra-processed foods. Tracking both healthy and unhealthy feeding

patterns is essential to assess how well the food system is delivering for children.

➤ **Improve metrics, data collection and targets for children’s diets and nutrition during the school-age years and through adolescence.**

Data on older children and adolescents are scarce and often of poor quality. Addressing this knowledge gap demands increased attention. Dietary and nutritional data for school-age children and adolescents are important not only to understand the geographic and socio-economic distribution of eating patterns and different forms of malnutrition in middle childhood and adolescence, but also to understand who and what influences dietary choices – if choices do exist – in this age group and to design effective interventions that target school-age children and adolescents. As is the case with complementary feeding, global and national targets for the nutrition of school-age children and adolescents are imperative if progress is to take place.

➤ **Support the development of novel analytical tools and methodologies for studying dynamic food systems and identifying the factors affecting children’s diets and nutrition.**

Industrialized food systems are characterized by complexity and rapid change. Putting children at the centre of food systems requires a new set of analytical tools and methodologies to understand how production and consumption

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choices are made, how children's food environments are shaped, and how different actors and stakeholders – public and private – interact. A range of established and innovative tools – including household surveys, food mapping and food system dashboards – can enable policymakers to compare their food system with those of other similar countries and identify key challenges and prioritize actions.

- **Set targets and improve data collection to measure the coverage and equity of essential nutrition services delivered through the health, water and sanitation, education and social**

protection systems. Globally, much of the data in the area of children's nutrition relate to services delivered through health system interventions and contacts. Given the important role of other systems in supporting children's nutrition, improved monitoring is needed of the interventions and actions delivered through all programmes and delivery platforms. Data systems and capacities should be strengthened to monitor newly developed indicators and targets for the coverage and equity of essential nutrition interventions. This is an essential step in ensuring that a transparent public accountability system is put in place. ■

A child is weighed during a routine growth monitoring session at the Centre for the Protection of Mother & Child Health. Tunis, Tunisia.
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SPECIAL SECTION

Better data, better diets

Like the challenge of malnutrition itself, data on child nutrition – what is tracked, analysed and compared across geographies and populations – are evolving. The global dietary shift and the triple burden of malnutrition are increasing the need for more data, while technologies are opening opportunities for new understanding. **As addressing malnutrition becomes more holistic, with a focus on systems that cut across sectors and take into account food environments and consumer behaviour, a wider range of actionable data is needed.**

Using data and evidence to shape decision-making for policies and programming is crucial to improving the lives of children. Unfortunately, current data gaps, particularly on the nature and quality of children’s diets around the world and across the life course, make the prevalence, nature and scope of malnutrition difficult to understand. The broader food environment in which dietary decisions are made is also poorly understood, highlighting the need for new tools to better understand children’s diets. Methods to measure food availability, access, affordability, demand and use as a set of inter-related factors that influence children’s diets are needed, along with tracking and understanding the nutrition transition as unhealthy diets become more prevalent worldwide.

However, the potential impact and effectiveness of data do not lie only in tracking more indicators or producing more surveys: the analysis and use of existing data to drive policy advocacy and programme design and implementation is vital. This effort must also be linked to the development of global and national targets for improving children’s diets and feeding practices.

Data on children under 5

Most data on nutrition for low- and middle-income countries relate to children under 5. Given the influence of the first 1,000 days on lifelong nutrition, health and economics and the amount of programming on early childhood

nutrition globally, this isn’t surprising. Indicators for this age group include:

- prevalence of low birthweight, stunting, wasting, and overweight
- rates of early, exclusive and continued breastfeeding
- timely introduction of complementary foods
- minimum meal frequency
- minimum diet diversity and minimum acceptable diet for ages 6–23 months
- vitamin A supplementation coverage, among others.

In low- and middle-income countries, stunting and overweight among children under 5 are tracked closely at the national level, albeit with varying frequency. Some countries invest in annual data collection, while others collect data every three to five years. Wasting, on the other hand, is a condition that can change seasonally and rapidly, so trends over time can be difficult to identify, although snapshot data are tracked through Multiple Indicator Cluster Surveys (MICS) and Demographic and Health Surveys (DHS), among others. With current data, countries and regions can be compared, but sub-national data by household wealth and geographic and sex differentials, available in some countries, can

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reveal important disparities that inform policy and local implementation. In high-income countries, on the other hand, these nutrition indicators tend to be lacking for children under 5 since they are either not collected systematically or not routinely reported in a comparable way.

Data gaps on the nutritional status of school-age and adolescent children

The nutritional status of older children is less well understood and tracked. The WHO/CDC Global School-Based Student Health Survey asks adolescents aged 13–17 about some aspects of their dietary behaviour (consumption of fruits, vegetables, soft drinks and fast food) and physical activity (physical education and cycling/walking to school), and indicators on overweight and thinness are tracked. However, these data are based on self-reported height and weight in European countries, which could underestimate obesity rates because of social desirability bias.¹ Additionally, the overarching gap is that a child's nutritional well-being throughout the life course is not tracked systematically. There is currently no standardized set of recommended indicators to be collected routinely through administrative systems, and no surveys at the country level.

Dietary habits and food intake

Another major gap is the lack of whole-of-diet data on what children, adolescents and women actually eat, and a dearth of data on micronutrient malnutrition. Without more knowledge on patterns and distributions of dietary habits, it is difficult to establish dietary priorities and goals.

Feeding practices for young children and mothers are tracked through household surveys, with the indicators for minimum dietary diversity (percentage of children 6–23 months of age who received foods from five or more food groups the previous day) and minimum acceptable diet

(number of children aged 6–23 months of age who had at least the minimum dietary diversity and meal frequency the previous day).

However, including diet diversity indicators – tracking how much and how often foods of various kinds are consumed, weighted by nutritional value – in more surveys for a broader range of children would provide a better understanding of malnutrition. These indicators have been found to be powerful predictors of economic status and malnutrition (both stunting and wasting).

Gathering reliable information on what children, adolescents and women eat is fraught with challenges. One example in data collection among school-age children is their limited cognitive ability to self-report their food intake. Some questionnaires can also be quite long, straining children's shorter attention spans. Many studies rely on questionnaires completed at school by children with little involvement of their parents. School-age children have been known to under-report or over-report their dietary intake, limiting the reliability of some data.

Surveys of adolescents are hampered by their lack of motivation to respond to voluntary questionnaires and body image issues. Under-reporting and misreporting of food intake are common among overweight and obese adolescents.

Finally, food composition databases, which give (not always accurate) estimates for energy and macro- and micronutrient levels in common local foods, are either unavailable at the country level or not uniform across countries, making cross-country comparisons difficult. They do not adequately address the special needs of young children. In many studies, global food composition databases are modified to accommodate country-specific foods, again making comparisons unreliable. ■



PERSPECTIVE

Working together to deliver healthy people and a healthy planet

Peter Bakker
President and
CEO,
World Business
Council for
Sustainable
Development

It is painfully visible that our food system is broken. Our future depends on our ability to create a food system that supports healthy people and a healthy planet. Current food systems are outstripping the resources of the planet, while diets are resulting in global health crises of both over- and undernutrition. All this will be amplified by continued population growth and changes in dietary habits.

The private sector is often seen as part of the problem, but I believe it can play a pivotal role in providing solutions. Take food processing for example: it can deliver high-quality food that extends the life of fruit and vegetables, thus reducing food waste. It can make healthy foods available all year round in environmentally challenged communities such as the Sahel region. In addition, when food is produced responsibly, the environmental impact of agricultural practices can be kept to a minimum or even be regenerative.

Nearly all food consumed around the world is produced, processed or supplied by business, ranging from smallholder farmers and family farms to large, multinational companies. This provides business with a unique opportunity and ability to improve children's health and quality of life by creating more healthy, enjoyable food for all, that is produced responsibly and sustainably.

There is a clear business imperative to help meet the nutritional needs of children: malnutrition contributes to reduced productivity, and rising health, insurance and environmental costs, as well as vulnerable supply chains,

which all have a direct impact on the bottom line. As populations grow and diets evolve, there are growth opportunities for companies that move first and create new markets for healthy food.

Food companies can help nudge parents and children towards healthy and sustainable food options. For example, advertising and in-store marketing are powerful tools that affect consumer behaviour. At the same time, business also needs to show restraint in advertising directly to children, because they are particularly susceptible to commercial messages. At the World Business Council for Sustainable Development (WBCSD), we are helping businesses to accomplish this, for example by developing a country-level project that includes a toolkit on marketing and advertising products containing less sugar.

Public education campaigns play an important role as well. A combination of policy, information and community engagement is required to reach everyone, including those living in disadvantaged communities.

We must also focus more on the environmental impact of food production. As we move towards the limits of the natural resources our planet can provide, diets need to be adjusted. Initiatives such as the EAT-Lancet Commission report, the FABLE Consortium's national country modelling, the Food Systems Dialogues, and the Food and Land Use Coalition are at the forefront of solving this challenge. Many leading businesses

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support and encourage their evidence-based work, using it to inform business strategy and actions.

Finally, healthy and sustainable food must be accessible and affordable. We cannot reinforce socio-economic inequities in feeding our children. Unfortunately, even in areas where food is widely available, healthier and more sustainable options are often more expensive. Moreover, many smallholder farmers don't have sufficient food remaining from their harvest, or enough money to purchase diverse healthy foods.

From a business perspective, today's children are tomorrow's farmers and company workers. Failing them is not an option, yet we are on a path to do so. We need to react urgently, and business must make bold strides to contribute to finding solutions.

At WBCSD, we're bringing together companies that are taking a leadership role to explore, develop and scale up solutions. Many of our member companies, individually and through WBCSD programmes and projects, are innovating to shift towards healthy diets. Our organization calls on business to transform the food system to achieve a vision of healthy people and a healthy planet, by:

- ensuring food and nutrition security in the supply chain
- making healthy, nutritionally appropriate and sustainably produced foods accessible and affordable to children and their families
- using the power of marketing responsibly by rebalancing marketing spending on healthy offerings, providing actionable information and making healthy options easily accessible
- engaging in platforms that convene business, government, science and civil society to transform the food system.

There is no silver bullet to solve malnutrition and only a collaborative and holistic approach will successfully transform the food system.

There is a massive urgency to act NOW: we have to build momentum for our children and our planet. Research published by the EAT-Lancet Commission has provided targets against which we can take aligned action. Let's work together to transform the food system and achieve our vision for healthy people and a healthy planet. ■

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Endnotes

INTRODUCTION: GROWING WELL IN A CHANGING WORLD

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CHAPTER 2: FEEDING A CHILD FOR LIFE

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CHAPTER 3: MALNUTRITION IN A CHANGING WORLD

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CHAPTER 4: RESPONSES TO MALNUTRITION

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CHAPTER 5: AN AGENDA TO PUT CHILDREN'S NUTRITION RIGHTS FIRST

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METHODOLOGIES FOR THE STATE OF THE WORLD'S CHILDREN 2019 WORKSHOPS

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NOTE ON FIGURES

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Methodologies for *The State of the World's Children 2019* workshops

Methodology

The State of the World's Children 2019 workshops used a distributed data-gathering process to collect adolescents' and mothers' insights, perceptions and experiences of food and nutrition. This process was co-designed by a team at Western Sydney University (WSU) and UNICEF and has been used previously in a range of international, child-centered research and child consultation projects, including for *The State of the World's Children 2017* report.

The process engaged representatives from UNICEF country offices and national committees to deliver five-hour, face-to-face workshops with adolescents aged between 14 and 16 (although a number of participants were older or younger than this), and with mothers of babies and infants who were still receiving complementary feeding. The workshops used a range of creative activities to elicit responses from participants. These focused on themes identified by UNICEF, WSU and an advisory board (see *Table A1*).

Before organizing the workshops, facilitators received a detailed guide and participated in a 90-minute training webinar to learn about workshop recruitment, content and administrative processes.

By the end of July 2019, workshops had been held in 18 countries: Afghanistan, Australia, Bangladesh, China, Egypt, Ethiopia, Ghana, Guatemala, India, Indonesia, Kyrgyzstan, Mexico, Nigeria, the Philippines, Serbia, the Sudan, the United States and Zimbabwe.

With one exception, each country hosted four workshops, and in total, 48 workshops were hosted for 464 adolescents and 328 mothers (five countries are missing from this analysis). The average workshop size was 16.5 participants. Participating country offices and national committees recruited a diverse

sample of participants, and some also ran workshops with specific groups, for example, internally displaced refugees in the Sudan.

The research received ethics approval from Western Sydney University's Human Research Ethics Committee (Approval No. H11101).

Support for the project was provided by the Government of Norway.

Data collection and analysis

Data and analysis from the workshops are not statistically representative. Rather, the aim was to enable adolescents and new mothers to describe in their own words their perceptions and experiences of the foods they eat and their ideas about nutrition.

The bulk of the data collected was qualitative. Participants worked individually and in groups to complete surveys, short-answer questions, creative exercises (e.g., drawing), scenario-based exercises and small-group discussions. The data gathered consisted of paper-based surveys, diagrams, drawings, written text and photographs.

Research materials were supplied in English. Where required, the staff of country offices translated materials into local languages before administering workshops. All non-English content generated by participants was translated into English by the staff of participating offices. Analysts had access to both the translated and original versions.

All the data were digitized by participating offices and uploaded to secure digital repositories. The data were then collated and analysed by the WSU team, both manually and using analysis software.

Thematic analysis was applied as the primary technique for understanding the data.

During data entry, individual researchers categorized relevant data blocks (e.g., phrases, quotes and sentences) according to the existing themes, and also derived new themes generated by the data. The team then reviewed and discussed relevant data and individual analyses, checking and refining their interpretations. Analyses were summarized and presented using quotes and images from participants, synopses (i.e., core insights and ideas derived from the data), and charts and graphics depicting key concepts and general trends.

Companion reports containing more extensive results and analysis from the workshops will be published in 2020.

Dietary coding

The evidence-based dietary guidelines of the governments of the United States and Australia respectively were used to code the data.^{1,2} These guidelines provide a grouping of foods that are recommended for daily consumption (core foods) for nutritional adequacy and growth, and additional food groups identified as being suitable for occasional consumption (non-core foods) to prevent diet-related chronic diseases.

A point of difference from these dietary guidelines in our coding is the separation of animal-based and plant-based protein. This separation was to specifically explore where and when participants did or did not have access to animal-based protein. With an association shown between children who do not consume adequate amounts of egg, meat and dairy and higher risks of stunting, the identification of this distinction in protein sources is important.³

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Workshop themes

| Adolescents | Mothers |
|--|--|
| Diet and nutritional intake | Children’s dietary intake |
| Health and body image | Mothers’ dietary intake |
| Food marketing | Influences on mothers’ feeding decisions |
| Food influences and environments: school | Feeding outside the home |
| Food influences and environments: home | Information sources for feeding |
| Barriers to healthy eating | Barriers faced by mothers feeding their babies |
| Food culture and special occasions | Feeding toddlers |
| Food sourcing and preparation | Sourcing and preparing family meals |

| Core Foods | |
|---|------------------------|
| Grains (e.g. breads, breakfast cereals, grains, noodles, pasta) | |
| Animal protein (e.g. lean meats, lean poultry, fish, seafood, eggs) | |
| Plant protein (e.g. nuts, seeds, legumes, beans, tofu) | |
| Dairy (e.g. milks, yoghurt, cheese) | |
| Vegetables (e.g. dark green or cruciferous, root, tubular and bulb vegetables, legumes, beans) | |
| Fruits (e.g. citrus, pome, tropical, berries, stone, figs, grapes, lychees) | |
| Unsaturated fats (polyunsaturated fats, mono-unsaturated fats) | |
| Non-core Foods | |
| Higher added sugars (e.g. honey, jams, marmalade, sugar, sugar confectionary, syrups) | |
| Higher saturated fat and sodium (e.g. bacon, cream, commercially fried foods, commercial burgers) | |
| Higher saturated fat and added sugars/sodium (e.g. biscuits, cakes, chocolate) | |
| Drinks | |
| Soft drinks | Fruit juices, cordials |
| Caffeine | Water |
| Alcoholic drinks | Energy drinks |

Note on figures

Figure A.1: Children not growing well

Children not growing well represents the percentage of children in one of the five categories: stunted, wasted, overweight, stunted and overweight, or stunted and wasted; the first three categories are often available in survey reports, but the last two categories require analysis of microdata. Estimates are based on 441 data sources included in the 2019 edition of the Joint Malnutrition Estimates (JME) where microdata was available for analysis. For countries without microdata, regional adjustment factors were applied based on the sub-regional aggregates of the overlap of stunting and wasting and stunting and overweight to generate country estimates of the five categories. Global and regional aggregates are based on the methodology described in de Onis M, Blössner M, Borghi

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Figure 1.4: Hidden hunger

The prevalence of hidden hunger is based on estimates of iron and vitamin A deficiency among children under-5 years, by UN sub-region. Prevalence of iron deficiency anemia (IDA) is based on Black et al. (2013).¹ A conversion factor of 2.0^{2, 3} was applied to calculate the prevalence of iron deficiency. Prevalence of vitamin A deficiency is based on Stevens et al. (2015).⁴ Sub-regions with missing data were conservatively assigned a prevalence of 0. For each sub-region, and assuming a 50 per cent overlap between deficiencies, the prevalence (P) of hidden hunger was

calculated as $P(\text{hidden hunger}) = P(a) + 0.5 \cdot P(b)$, where P(a) and P(b) are the maximum and minimum values, respectively, when comparing iron and vitamin A prevalence estimates. Drawing on sub-region-specific estimates of under-5 population sizes, the global number of children <5 years affected was calculated and a weighted global prevalence estimate of hidden hunger was generated.⁵

'What are young children eating? The importance of first foods' (pp. 74–75)

The regional and global estimates were generated using the most recent data available for each country between 2013 and 2018. UNICEF regional and global estimates are population weighted averages using the 2018 estimates from the World Population Prospects, 2019 revision as weights.

For the first time in 20 years, UNICEF's *The State of the World's Children* examines the issue of **children, food and nutrition**, providing a fresh perspective on a rapidly evolving challenge. Despite progress in the past two decades, one third of children under 5 are malnourished – stunted, wasted or overweight – while two thirds are at risk of malnutrition and hidden hunger because of the poor quality of their diets. These patterns reflect a profound triple burden of malnutrition – undernutrition, hidden hunger and overweight – that threatens the survival, growth and development of children and of nations. At the center of this challenge is a broken food system that fails to provide children with the diets they need to grow healthy. This report provides new data and analyses of malnutrition in the 21st century and outlines recommendations to put children's rights at the heart of food systems.

Embargoed
until 00.01 GMT
15 October 2019



ISBN: 978-92-806-5003-7



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October 2019

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