

A LIFE FREE FROM **HUNGER**



Save the Children®



Delhi, India.

A LIFE FREE FROM **HUNGER**

Tackling child malnutrition



Save the Children®

Save the Children works in more than 120 countries.
We save children's lives. We fight for their rights.
We help them fulfil their potential.

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Cover photo: Nabalo, three, holds a bowl of Lalok fruit, Kapoeta North, South Sudan. If families here are lucky, they eat twice a day; many eat only once. The wild fruits Nabalo is holding are of little nutritional value, and can cause diarrhoea in children. (Photo: CJ Clarke/Save the Children)

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VITAL STATISTICS

1 IN 4

One in four of the world's children are stunted.¹ In developing countries this figure is as high as one in three.² That means their body and brain has failed to develop properly because of malnutrition.

2.6 MILLION

Malnutrition is an underlying cause of the death of 2.6 million children each year – one-third of the global total of children's deaths.^{3,4}

80%

80% of stunted children live in just 20 countries.⁵

0.6 PERCENTAGE POINTS

Global progress on stunting has been extremely slow. The proportion of children who are stunted fell from 40% in 1990 to 27% in 2010 – an average of just 0.6 percentage points per year.⁷

48%

48% of children in India are stunted.⁶

TWICE AS LIKELY

In the poorest countries, the poorest children are two times more likely to be chronically malnourished than their richest counterparts.⁸

450 MILLION

450 million children will be affected by stunting in the next 15 years, if current trends continue.⁹

1.6 MILLION MORE

Seven countries are projected to see an increase in numbers of stunted children by 2015. Nigeria is projected to have 1.6 million additional stunted children and by 2020 Tanzania is projected to have 450,000 extra stunted children.¹⁰

20% LESS

Adults who were malnourished as children earn at least 20% less on average than those who weren't.¹¹



EXECUTIVE SUMMARY

As world leaders have been occupied with one economic crisis after another, a hunger and malnutrition crisis affecting millions of children has gone unchecked. While the world has been experiencing years of financial turmoil, pervasive long-term malnutrition is slowly eroding the foundations of the global economy by destroying the potential of millions of children.

This crisis is not new. Progress on reducing malnutrition has been pitifully slow for 20 years. But a combination of global trends – climate change, volatile food prices, economic uncertainty and demographic shifts – is putting future progress on tackling malnutrition at risk.

Action must be taken now to prevent the crisis deteriorating and more children suffering the life-long consequences. By mid-2013, it will already be too late to make a difference to the last generation of children who will reach their second birthday – a crucial nutrition milestone – by 2015. That's the deadline for the eight Millennium Development Goals, six of which are dependent in part on tackling malnutrition.

Every hour of every day, 300 children die because of malnutrition. It's an underlying cause of more than a third of children's deaths – 2.6 million every year.¹ But it's not recorded on death certificates and, as a result, it's not effectively addressed.

Even for those children who survive, long-term malnutrition causes devastating and irreversible damage. Lack of nutritious food, coupled with infection and illness, means their bodies and brains don't develop properly. At least 170 million children are affected by stunting.²

This means that not only are they too short for their age – they're also likely to enrol at school later and to do less well academically. For example, iodine deficiency, a type of malnutrition caused by a lack of specific nutrients, affects one-third of schoolchildren in developing countries and is associated with a loss of 10–15 IQ points.³ Childhood malnutrition can lessen productivity – stunted children are predicted to earn an average of 20% less when they become adults.⁴

If current trends continue, the lives of more than 450 million children globally will be affected by stunting in the next 15 years.⁵

MALNUTRITION: THE TRUE STORY

Improving nutrition is key to child survival. It will save many lives and give all children the chance of a good start in life so they can grow up to fulfil their potential.

Malnutrition is undermining economic growth and reducing the productivity of people trying to work their way out of poverty in the world's poorest countries. It's estimated that 2–3% of the national income of a country can be lost to malnutrition.⁶

Opposite: Najaatou, age one, Niger

EVERY HOUR OF EVERY DAY, 300 CHILDREN DIE
BECAUSE OF MALNUTRITION.

Improving nutrition is a good investment. The solutions that are outlined in this report are cost-effective and relatively simple to implement. Many of them will pay for themselves in terms of the boost they give the economy of a country and by lowering the cost of healthcare – well nourished children are less prone to disease and illness. Investing in nutrition is investing in the future of a country – it creates stronger communities with a healthier, smarter and more productive population.

The world has enough food for everyone, so putting an end to the hunger and malnutrition crisis is the right thing to do. Every child has the right to a life free from hunger. No child should be born to die from a cycle of malnutrition and disease because they are not able to eat enough nutritious food.

Improving child nutrition and reducing levels of child mortality can lead to smaller families and more sustainable societies. When children are healthier and more likely to survive, and when parents have access to voluntary family planning methods, many parents will choose to have fewer children, further apart, and to invest in the children who now survive. An added benefit is the reduction in population growth over the long term.

WE ALREADY KNOW THE SOLUTIONS THAT WORK

Direct interventions: Simple solutions delivered to children who are at risk of malnutrition and their families are already well known and well supported by nutrition experts. In 2008 the *Lancet* medical journal identified a package of 13 direct interventions – such as vitamin A and zinc supplements, iodised salt, and the promotion of healthy behaviour, including handwashing, exclusive breastfeeding and complementary feeding practices– that were proven to have an impact on the nutrition and health of children and mothers. This cost-effective and affordable package could prevent the deaths of almost 2 million children under five and a substantial amount of illness if it was delivered to children in the 36 countries that are home to 90% of the world's malnourished children.⁷ The reason these proven interventions have not been scaled up is due to public policy decisions and chronic under-investment in the health services needed to deliver them.

Fortification, or the process of adding vitamins and minerals to food, is one of the most cost-effective direct interventions. Fortification of staple foods during production – for example, adding iron to flour in mills; or through breeding crops that are more nutritious, such as a sweet potato rich in vitamin A that has been introduced in Mozambique – can benefit an entire population. To reach children with fortified foods during the critical periods of growth and development requires a more targeted approach. Commercial fortification of products for 6–24-month-old children by food

companies and the addition of micronutrient powders to traditional foods both show promise. (See chapter 2.)

At a cost of just over US\$1 per person per year, the World Bank has estimated that more than 4 billion⁸ people would be able to benefit from access to fortified wheat, iron, complementary food and micronutrient powders.⁹

Protecting families from poverty: Poverty is one of the main underlying causes of malnutrition. For many families, their children become malnourished and stunted not because there is no nutritious food available, but because they cannot afford to buy it. Save the Children's research shows that a significant proportion of families in communities in Bangladesh, Ethiopia and Kenya could not afford to feed their families a nutritious diet even if they spent all of their income on food.¹⁰ In cases like this, providing families with cash or food to keep them above the poverty line and protect children from malnutrition can be the best solution.

Social protection schemes – which provide families with regular cash transfers or food parcels that provide a safety net during hard times – have proved successful in many countries in protecting families from the worst effects of poverty. These types of schemes have been gaining global momentum in recent years. Pioneered in Latin American countries in the last decade, they have now been introduced or are being considered in many other countries. Brazil, for example, has shown how investing in social protection can dramatically reduce hunger and malnutrition, and also contribute to economic growth. Widespread implementation of social protection has real potential to reduce global malnutrition. To achieve this, it's vital that schemes are linked specifically to nutrition and that they target pregnant and breastfeeding mothers and children up to the age of two. (See chapter 3.)

Making the global food system work for nutrition: The global system by which food is produced, distributed and consumed is currently failing to meet the nutritional needs of much of the world's population.

Making the food system work for nutrition means more than simply increasing production – more food does not automatically mean better nutrition. The focus must be on the final outcome – improving children's diets. Investing in small farmers and female farmers is key – three-quarters of Africa's malnourished children live on small farms and 43% of agricultural work is carried out by women.¹¹ Success depends on ensuring local markets are accessible and functioning; on improving education about nutrition; and on investing in better research and evidence.

This challenge is especially urgent at a time when the world's food system is under threat from global trends, such as population growth and climate change. (See chapter 4.)

INVESTING IN NUTRITION IS INVESTING IN THE FUTURE OF A COUNTRY – IT CREATES STRONGER COMMUNITIES WITH A HEALTHIER, SMARTER AND MORE PRODUCTIVE POPULATION.

GALVANISING POLITICAL COMMITMENT

Underlying the need for these direct and intermediate solutions is an urgent requirement for world leaders to recognise the key role of nutrition in saving children's lives. They must dedicate the necessary time and resources to ending the malnutrition crisis. Hunger and malnutrition are political problems and therefore need political solutions.

The responsibility for action rests on the shoulders of three different – but interconnected – groups of world leaders. First, the countries with high numbers of malnourished children must be committed to improving nutrition. Brazil, Bangladesh and Ghana have shown that it is possible to achieve significant reductions in the percentage of under-fives who are malnourished. Their example can inspire other countries to take action to address the nutrition crisis for the poorest people on the scale needed. This is particularly important in countries that are home to a large number of stunted children, such as India and Nigeria.

Second, the existing global institutions that have a mandate to tackle hunger and malnutrition lack a coherent strategy to improve nutrition. The lives of millions of children depend on the leaders of these agencies making the system work for nutrition.

Third, for far too long rich country governments did not give nutrition the support it deserved. This has been improving in recent years, and political momentum is growing, particularly through processes like the Scaling Up Nutrition movement, but nutrition is still poorly understood and poorly resourced.

Tackling the global malnutrition crisis needs concerted and coordinated global action. And it needs strong leadership. Ultimately, world leaders can set in motion the most fundamental improvements by taking high-level political action, whether that is by hosting an international summit on nutrition to build momentum, by starting a national social protection scheme or by allocating more funding to nutrition.

2012 – A VITAL YEAR

2012 is a vital year to get nutrition right for children and to end the hidden malnutrition crisis. By mid-2013, it will already be too late to provide protection from stunting for the last generation of children who will reach their second birthday – a key nutrition milestone – by the MDG deadline.

Significant progress has already been made in saving children's lives. The number of children not making it to their fifth birthday has fallen from 12 million in 1990 to 7.6 million in 2011. Momentum is building – in 2011 world leaders made critical progress on immunisation by pledging to vaccinate 250 million children by 2015, saving 4 million lives, and 40 countries committed to filling the 3.5 million health workers gap. Action must continue on both these fronts. At the same time we must accelerate efforts to improve nutrition, which holds the key to further progress in saving children's lives.

SIX KEY STEPS TO TACKLING MALNUTRITION

We're calling for national and international action on six key steps to tackle the global malnutrition crisis head on:

1. **Make malnutrition visible:** Chronic malnutrition is a hidden killer that kills slowly and doesn't appear on death certificates. In order to make the deaths of these children count and to make governments accountable for preventing them, there must be an agreed global target for a reduction in stunting in the countries with the highest burden.
2. **Invest in direct interventions:** The cost of scaling up the 'Lancet package' of 13 interventions, including fortification, is \$10–12bn a year. Shared between developing and donor governments, this sum is easily affordable. It could save 2 million lives.
3. **Fill the health worker gap:** There is a critical shortage of at least 3.5 million doctors, nurses, midwives and community health workers, who are vital in delivering the direct interventions that can improve nutrition. Governments and donors should work together to fill this health worker gap by recruiting, training and supporting new and existing health workers, and deploying them where they are most needed.
4. **Protect families from poverty:** Many of the best examples of progress in tackling malnutrition have come from countries that have invested in effective social protection policies that reach vulnerable families. Countries should work towards establishing systems that reach pregnant and breastfeeding women, and children under two.
5. **Harness agriculture to help tackle malnutrition:** Governments must support small-scale farmers and female farmers, and ensure that making a positive impact on nutrition is an explicit objective of agriculture policies, by focusing on projects that are designed to improve children's diet – for example, home gardening or education projects that focus on nutrition.
6. **Galvanise political leadership:** Raising the profile of malnutrition requires a build-up of political momentum to galvanise change. The US G8 and the Mexican G20 in 2012, and the UK G8 in 2013 all offer major opportunities for progress, as food, nutrition and social protection are likely to be on the agenda. These countries should work together to ensure an ambitious action plan that aligns institutional reform with clear delivery of new resources. With the support of the international community, countries with high malnutrition burdens should exhibit the leadership and commitment needed to eliminate malnutrition.



PHOTO: HARRIET LOGAN/SAVE THE CHILDREN

INTRODUCTION

As world leaders have been occupied with one economic crisis after another, a global hunger and malnutrition crisis has continued unchecked. While the world has been experiencing years of financial turmoil, pervasive hunger and malnutrition are slowly eroding the foundations of the global economy by destroying the potential of millions of children.

This crisis is not new. Progress on reducing malnutrition has been pitifully slow for the last 20 years, falling at an average rate of only 0.65 percentage points per year since 1990.¹

In the world today, one child in four is stunted due to malnutrition,² and in developing countries this figure is as high as one in three.³

Research by Save the Children suggests that, if current trends continue, an extra 11.7 million children will be stunted in sub-Saharan Africa in 2025 compared to 2010.⁴ Action must be taken now to prevent the crisis deteriorating and more children suffering the life-long consequences. If current trends continue, the lives of more than 450 million children globally will be affected by stunting in the next 15 years.⁵

The most obvious sign of stunting is that a child is significantly too short for their height; but it also has damaging consequences that can't be seen, which affect the development of the brain and children's future potential.

STUNTING – THE FACTS

- An estimated 171 million children are stunted.⁶
- Around 80% of stunted children live in just 20 countries.⁷
- More than a third of children in Asia are stunted, which accounts for almost 100 million of the global total.
- Of countries with reliable data, Madagascar has the highest stunting rate, with over half of children being stunted.⁸
- India, a lower middle-income country, has a shockingly high rate of 48% of children who are stunted, though there is large variation between states.⁹

A combination of global trends – climate change, volatile food prices, economic uncertainty, the global health worker shortage and demographic shifts – is putting future progress on reducing stunting at risk:

- It is predicted that 7 million more children will be stunted in Asia by 2050 due to climate change,¹⁰ which is anticipated to affect future cereal yields and is a threat to global food security.
- Staple food prices hit record highs in February 2011 and may have put the lives of up to 400,000 more children at risk.¹¹

Opposite: Zaharia, 7, carries her brother, Issaka, across the barren landscape where they're struggling to grow their crops. Niger.

- The World Bank predicts an increase in poverty as families face a triple squeeze from falling incomes and remittances, rising costs, and shrinking public expenditure, including aid.¹²
- In 2011 the world's population reached 7 billion.¹³

WHAT CAN WE DO?

Despite these trends, there are clear solutions to the chronic malnutrition crisis. The technical, political and legal foundations¹⁴ of a co-ordinated response to nutrition have been put in place and momentum must be maintained.

What is needed now is concerted action to tackle the scourge of malnutrition. As the 2015 deadline for the Millennium Development Goals approaches, 2012 will be a crucial year in tackling the long-term hunger and nutrition crisis.

Save the Children has prioritised the theme of reducing malnutrition as part of its global campaign to make sure that every child has the chance to survive past their fifth birthday and to grow to fulfil their potential.

CHAPTER OVERVIEW

This report analyses the causes of malnutrition – focusing in particular on chronic malnutrition and stunting in children – and identifies solutions. It sets out key recommendations to help give every child a life free from hunger.

Chapter 1 outlines the scale of the malnutrition crisis and the causes and consequences of malnutrition, and examines the relationship between economic growth and nutrition.

Nutrition experts have agreed 13 low-cost interventions that, if implemented to complete coverage,¹⁵ could reduce stunting by 36% and child deaths by 25%, saving the lives of 2 million children.¹⁶ Chapter 2 considers how these interventions – such as exclusive breastfeeding, micronutrient supplementation and fortification – can improve the quality of children's health and well-being.

There is growing evidence that social protection and changes to agricultural policy and practice have real potential to improve the diets of pregnant women and young children. Chapter 3 examines how cash transfers and other social protection schemes can ensure that families are better able to afford healthy food and services, such as medicines and children's health checks. In other words, it looks at how to provide more money for nutrition.

Chapter 4, by contrast, looks at how to get more nutrition for the money. It argues that agricultural policies are not working for the poorest and looks at how agricultural production can be more suited to meet the nutritional needs of children.

Global leaders have committed to new nutrition initiatives to enhance investment in these solutions – for example, the Scaling Up Nutrition (SUN) movement. Chapter 5 examines the political factors that contribute to the global burden of hunger and malnutrition, and recommends how governments, multilateral agencies, business and individuals can play their part in tackling the problem.

SAVE THE CHILDREN – WORKING TO TACKLE MALNUTRITION

Save the Children has developed expertise in designing, implementing and evaluating large-scale nutrition programmes and developing diagnostic tools to prevent malnutrition. Today, we are working on hunger and malnutrition in more than 30 countries around the world.

Examples of our recent and current work include:

- In **India**, Save the Children works on tackling malnutrition in seven states and was recently selected to host the Coalition for Sustainable Nutrition Security, which is creating a strong evidence base to use in advising the government on nutrition programmes.
- In **Bangladesh**, we have worked with a group of national and international partners on a USAID-funded project on food security, health and nutrition that has reached more than 2.6 million people. Exclusive breastfeeding increased from 30% to 64%. Stunting levels were reduced from 36% to 32%.
- In **Ethiopia**, we are leading an initiative to improve the nutrition and livelihoods of pastoralists, and working with the Ministry of Health and other partners to test how infant and young child feeding practices can be integrated into the community management of acute malnutrition.
- In northern **Nigeria** we are leading a consortium, along with UNICEF, to scale up the treatment of acutely malnourished children in five states, and improving coverage of infant and young child feeding to benefit more than 6 million children.
- We are scaling up our **community-based approach to the management of acute malnutrition**. Instead of spending four weeks in a therapeutic feeding centre or hospital, 85% of acutely malnourished children can now be treated at home.
- Our emergency response to the 2011 **East Africa food crisis** included a massive screening and feeding programme for children under five, pregnant women and breastfeeding mothers, reaching 450,800 people, including 293,000 children.
- Our **Household Economy Approach** is helping governments in the Sahel region of Africa to predict food and nutrition crises. Our **Cost of a Diet** analysis tool is being used by the World Food Programme, Bioversity International and governments.
- We are a leading member of the **Scaling Up Nutrition (SUN)** movement and a signatory to the **Charter to End Extreme Hunger**.
- Save the Children is the technical partner for infant and young child feeding in USAID's flagship **\$200 million SPRING** (Strengthening Partnerships, Results and Innovation in Nutrition Globally) **project**. We have also signed a five-year, \$46 million agreement with USAID to improve the nutritional status of women and infants in **Nepal**.
- We are part of the UK Department for International Development's new flagship research consortium, **Transform Nutrition**, led by the International Food Policy Research Institute, and focusing on India, Bangladesh, Ethiopia and Kenya.

PHOTO: JAN GRARUP/NOOR FOR SAVE THE CHILDREN



Hilaweyn camp, Dollo Ado, Ethiopia

I THE GLOBAL MALNUTRITION CRISIS

The world has enough food for everyone, but millions of children face a life sentence of hunger and malnutrition – the hidden reason so many die.

Malnutrition is an underlying cause of more than 2.6 million child deaths every year, a third of the total of child deaths.¹ Many malnourished children die because they are vulnerable to repeated bouts of disease and infection. Others become malnourished while suffering from infectious disease and are unable to recover. But malnutrition is not recorded on death certificates, not prioritised by any government ministry, and, as a result, not effectively addressed.

Millions more children survive, but grow up malnourished, without ever having enough nutritious food to eat and without getting the nutrients they need to be healthy. The World Health Organization states that poor nutrition is the most important single threat to the world's health.²

Growing up without enough energy, protein, vitamins and minerals means children's brains and bodies do not develop properly and they become stunted,³ a devastating and permanent impact. Stunted children are not able to fulfil their physical, academic or economic potential. And stunted mothers are more likely to have underweight children;⁴ thus, the cycle of poverty and malnutrition continues.

Chronic child malnutrition is an ongoing, permanent emergency affecting 170 million children. It occurs on an even greater scale than the devastating emergency food crises that follow crop failure, climate disaster or conflict – such as the emergency in East Africa in 2011 that affected more than 6.5 million children.⁵

Yet chronic malnutrition remains largely ignored. Alongside headline-grabbing emergencies, the unseen crisis of long-term malnutrition has failed to attract the global attention it deserves. While impressive progress has been made in other areas, such as a 40% reduction in the global death rate from tuberculosis since 1990⁶ and a 25% reduction in malaria mortality since 2000,⁷ the fall in the proportion of children who are stunted in the world is scandalously slow, declining at an average rate of 0.65 percentage points per year since 1990.⁸ In Africa the comparison is even starker: since 1990 malaria mortality has fallen 33%, whereas stunting has fallen by just one percentage point over the same period.⁹

MALNUTRITION IS AN UNDERLYING CAUSE OF MORE THAN 2.6 MILLION CHILD DEATHS EVERY YEAR, A THIRD OF THE TOTAL CHILD DEATHS.

THE FALL IN THE PROPORTION OF CHILDREN WHO ARE STUNTED IN THE WORLD IS SCANDALOUSLY SLOW.

WHAT IS MALNUTRITION?

Malnutrition¹⁰ can take a number of forms – stunting, wasting and micronutrient deficiency – which are described below. The different types of malnutrition can overlap – for example, a stunted child may also be wasted and have micronutrient deficiencies.¹¹ The main focus of this report is on stunting and chronic malnutrition. Micronutrient deficiencies, particularly in chapter 2, and wasting are also discussed.

STUNTING

Stunting, or chronic malnutrition, is a result of a child having a poor diet – too few calories or too little nutritious food, or both – for a number of years, or an infection leading to malabsorption of nutrients.¹² The first 1,000 days of life – beginning with conception, through a mother’s pregnancy and up until the age of two – is the most critical period in a child’s development.¹³ Even if a child’s diet improves later in life and any health issues are resolved, damage done during this period is largely irreversible.

Stunting refers to a child who is too small for their age because they have not developed properly. The body adapts to a long-term lack of nutrients by giving priority to the needs of vital organs and functions rather than to growth in height.¹⁴

Children have the same growth potential up to age five, irrespective of where they are born. In a healthy, well-nourished population only around 2% of children would naturally be short enough to be classed as stunted.¹⁵ Stunting can have an intergenerational effect: a mother who is stunted may in turn give birth to a small baby, because the foetus’s growth in the womb may have been restricted.

Save the Children compared children’s height and age scores from country surveys against the World Health Organization’s international child growth standards for two-and-a-half-year-old children. This is the age when stunting is most apparent. The ten countries with the biggest difference in height from the standard are listed in Table 1. In Niger, the average height of a two-and-a-half-year-old girl is 82.2cm – 8.5cm shorter than a non-stunted child, a 9% deficit. For a girl of the same age in the UK, the average height is 90.2cm.¹⁶

WASTING

Wasting results from a severe, and often sudden, lack of food or disease. This type of acute malnutrition may follow a failed harvest, or may occur when families have to flee from conflict, leaving their food stocks behind, or may result from an infectious disease, such as cholera. With wasting, a child does not consume enough food or absorb enough to get the calories or nutrition they need, and as a result their body begins to digest muscle to meet the need for protein, minerals and energy. In total, 55.5 million children – around 9% of all children globally – are wasted.¹⁷

TABLE I THE EFFECT OF STUNTING ON A CHILD'S HEIGHT: THE TEN COUNTRIES WITH THE LARGEST HEIGHT DIFFERENCE FROM THE WHO CHILD GROWTH STANDARD¹⁸

	Year of survey	Average height of 2½-year-old girl (cm)	Difference from WHO growth standard	Average height of 2½-year-old boy (cm)	Difference from WHO growth standard
WHO growth standard		90.7		91.9	
Niger	2006	82.2	8.5	83.7	8.2
Ethiopia	2011	82.9	7.8	84.4	7.5
Timor Leste	2009/10	83.3	7.4	84.7	7.2
Rwanda	2005	84.0	6.7	85.4	6.5
Nepal	2006	84.3	6.4	85.8	6.1
Bangladesh	2007	84.7	6.0	86.1	5.8
Guatemala	2008	84.7	6.0	86.1	5.8
Guinea	2005	84.7	6.0	86.1	5.8
India	2005/06	84.7	6.0	86.1	5.8
Tanzania	2010	84.7	6.0	86.1	5.8

The last five countries in the table all have the same measurement for boys and girls.

Source: most recent Demographic Health Survey, excluding Guatemala which is based on data from RHS¹⁹

MICRONUTRIENT DEFICIENCY

A long-term lack of nutritious food, or having an infection such as worms,²⁰ can result in a lack of vitamins and minerals in a child's diet. Micronutrient deficiencies represent a serious risk to a child's health: they account for one-third of all malnutrition-related child deaths, and 10% of all children's deaths. Nearly all deaths linked to micronutrient deficiency are due to a lack of vitamin A, zinc²¹ or iron.

One-third of children don't consume enough vitamin A, which means their immune systems are weakened and they are at greater risk of dying from infectious diseases. In 2004, vitamin A deficiency accounted for almost 670,000 deaths, representing 6.5% of the global child mortality burden.²²

THE FIRST 1,000 DAYS OF LIFE – BEGINNING WITH CONCEPTION, THROUGH A MOTHER'S PREGNANCY AND UP UNTIL THE AGE OF TWO – IS THE MOST CRITICAL PERIOD IN A CHILD'S DEVELOPMENT.

Almost half of children in low- and middle-income countries – 47% of under fives – are affected by anaemia,²³ which impairs cognitive and physical development, and reduces physical performance and productivity. Half of anaemia cases are due to iron deficiency.²⁴ According to the World Health Organization, 42% of pregnant women – 56 million women – suffer from anaemia,²⁵ which increases the risk that mothers and their babies will die at childbirth or that the baby will have a low birth-weight or pre-term delivery. If a mother is anaemic, her infant is more likely to be anaemic too, leading to greater risk of impairments in future mental and physical development. Anaemia is estimated to contribute to more than 115,000 maternal deaths and 591,000 perinatal deaths – ie, that occur in the period immediately before and after birth – globally per year.²⁶

THREE TYPES OF MALNUTRITION

Stunting: a child is too short for their age – a result of chronic malnutrition

Wasting: a child's weight is too low for their height – a result of acute malnutrition

Micronutrient deficiency: a lack of one or more essential vitamins and minerals, such as vitamin A, iron or zinc.

WHAT CAUSES MALNUTRITION?

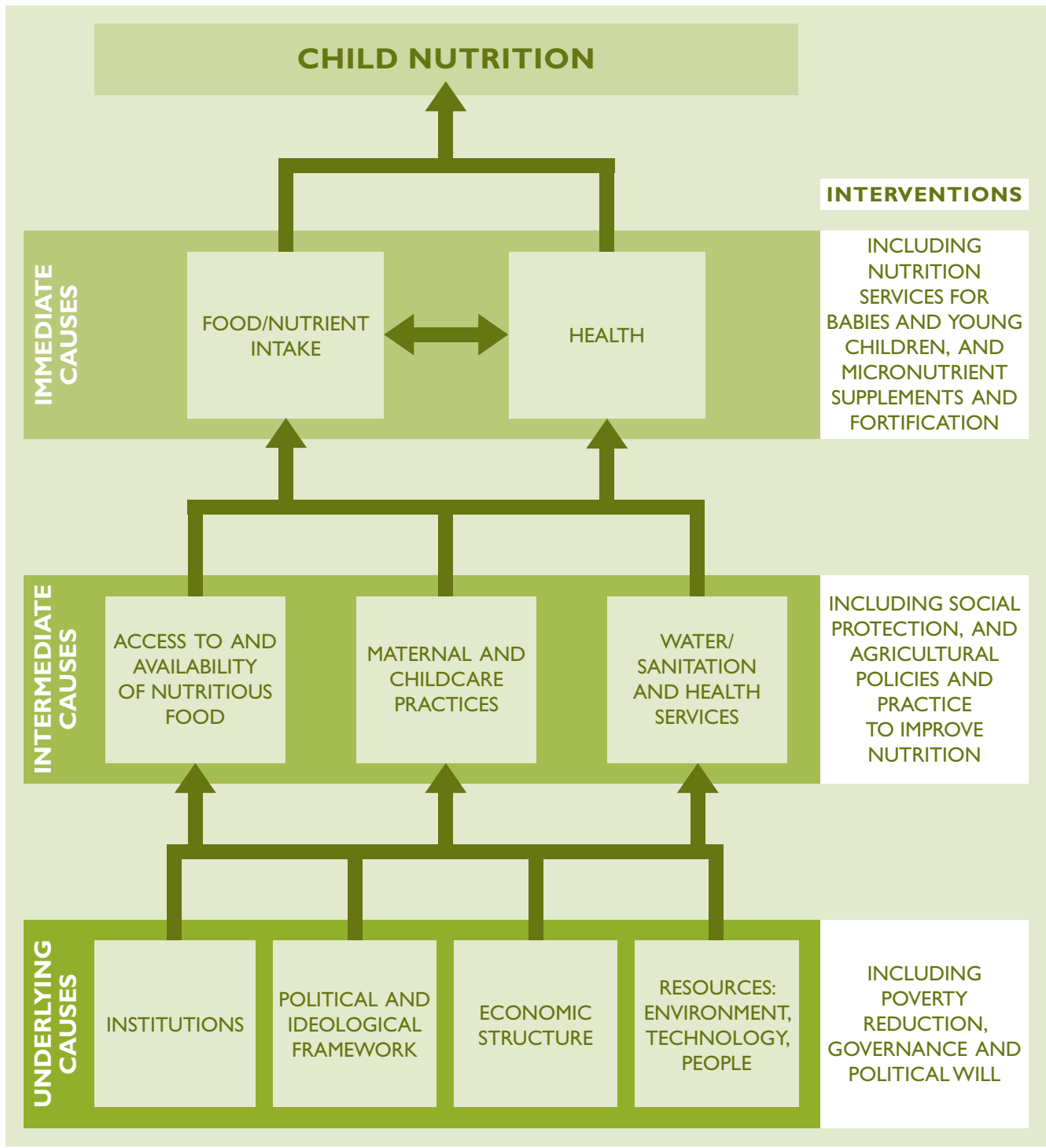
At the most immediate level, malnutrition is caused by inadequate diet and by infection. These primary causes of malnutrition are influenced by food access and availability, healthcare, water and sanitation, and the way a child is cared for (for example, whether the infant is breastfed and whether basic hygiene practices are used, such as hand-washing).

Underlying all of these primary and intermediate causes of malnutrition are poverty, lack of resources (eg, financial and human resources), and social, economic and political factors (eg, women's status) (see figure 1).

WHY ARE SO MANY CHILDREN MALNOURISHED?

A child growing up in South Sudan needs to eat food with the right amount of calories, vitamins and minerals to have a chance to grow up healthy and productive just as much as a child born in Southampton, Stockholm or Seattle. Yet many children in developing countries have diets that consist almost entirely of starchy staple foods, like rice, maize

FIGURE 1 DETERMINANTS OF CHILD NUTRITION AND INTERVENTIONS



Source: Adapted from UNICEF 1990, Ruel 2008 and World Bank (draft) 2011

or millet, with few vegetables and little protein. They may get enough calories, but they miss out on a varied diet that would give them enough protein and vital vitamins and minerals. Save the Children found that more than half of children in all developing countries for which data was available had a diet that comprised just three food groups or fewer. For many children this means only three food items or fewer – the staple food (eg, rice, maize flour), a pulse (eg, peas, lentils) and a vegetable (often green leaves).²⁷

The World Health Organization and other experts recommend that a baby should be exclusively breastfed for their first six months. This has been proven to maximise their development and chances of survival.²⁸ From six months they should be fed a diverse range of foods (eg, milk, eggs, meat, and foods rich in fats) in addition to continuing to be breastfed, ideally until the age of two, to ensure they get all the nutrients they need. Young children have relatively greater need of calories than adults, as they are growing so fast in their early years and have a higher metabolism.

SILENT KILLER

Malnutrition is a silent killer – under-reported, under-addressed and, as a result, under-prioritised. Malnutrition-related deaths are often put down to the disease that the child eventually died from. As a result, malnutrition – although recognised as the underlying cause of a third of under-five deaths – does not tend to appear on children's death certificates, in country records or in global child mortality statistics.

The statistical invisibility of malnutrition, especially stunting, is one possible explanation for the slow progress on reducing the proportion of stunted children in relation to reducing other causes of child mortality. It has been estimated that, in the 20 countries that are home to 80% of the world's stunted children, malnutrition was an underlying cause of 51% of diarrhoea deaths, 57% of malaria deaths, 52% of pneumonia deaths and 45% of measles deaths.²⁹

A DEADLY CYCLE

Malnutrition and disease work in a deadly cycle. A malnourished child is more likely to suffer from disease, and the more they suffer from disease the more likely they are to be malnourished. Inadequate food intake leads to weight loss, and a weakened immune system, which means that childhood diseases will be more severe and will last longer. This in turn leads to a loss of appetite.



Maritu, left, with her friend Adna

“THERE ISN’T ENOUGH TO EAT”

“Today I had a small piece of *injera* [a flatbread made by grinding the seeds of teff grass into a flour and served with a basic sauce] for breakfast – one *injera* shared between four people – and I had the same for lunch.

“We don’t eat anything else – I might get egg or meat once a year for special occasions.

“There isn’t enough, but my parents give me whatever is available. Sometimes I feel hungry at school.”

Maritu, 9, Ethiopia

MALNUTRITION IS A SILENT KILLER – UNDER-REPORTED,
UNDER-ADDRESSED AND, AS A RESULT, UNDER-PRIORITISED.

THE ECONOMIC CASE FOR TACKLING MALNUTRITION

Since 2008, countries large and small have faced tough economic times. As donor countries re-evaluate their development strategies and developing countries wrestle with scarce resources, nutrition is located at the nexus of good development and smart economics. In addition to the negative, and often fatal, health consequences for children, malnutrition means children achieve less at school and their productivity and health in adult life is affected, which has dire financial costs for entire countries.

Stunting stymies both physical and cognitive growth. It is linked to children starting school late and to failure to complete primary education. A multi-country study has shown that stunting at age two is associated with a reduction in schooling of almost one year, with a 16% increase in risk of failing at least one grade.³⁰ Iodine deficiency, which affects one-third of school children in developing countries, leads on average to a loss of 10–15 IQ points,³¹ and stunting has been shown to be associated with significant reductions in cognitive development.³² The effect of this on a child's future potential is significant. In Zimbabwe, malnutrition is judged to have reduced lifetime earnings of individuals by 12% due to its impact on educational achievement.³³

Adults affected by malnutrition throughout their lives have been judged to earn almost 20% less than their non-affected counterparts.³⁴ A 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in productivity.³⁵ Iron deficiency anaemia has been associated with a 17% loss of productivity in heavy manual labour.³⁶ The economic losses due to undernutrition are also pervasive – experimental evidence suggests that tackling malnutrition in early life can lead to as much as a 46% increase in earnings as an adult.³⁷ Productivity loss due to foregone waged employment was estimated to be US\$2.3 billion a year in India.³⁸

When viewed in relation to the scale of the global malnutrition crisis and the millions of children who are stunted in poor countries, these findings on educational achievement and productivity in later life indicate that nutrition plays an important role in economic growth and development. National economic growth is negatively affected by malnutrition, which commonly leads to losses in GDP by poor nations of as much as 2–3% per annum.³⁹ Globally it is estimated that the direct cost of child malnutrition is between \$20 billion to \$30 billion per year.⁴⁰

In addition to benefiting a country's GDP, ensuring good nutrition in the first 1,000 days represents one of the best buys for child health. It generates a lifetime return in terms of preventing illness. Malnutrition in early childhood takes its toll on health later in life. Individuals are more likely to suffer from non-communicable diseases, such as heart and kidney disease, and diabetes. Estimates suggest that 11% of the total global disease burden relates back to malnutrition⁴¹ – improving childhood nutrition would reduce national health bills.

MALNUTRITION CAN LEAD TO LOSSES IN GDP BY POOR NATIONS OF UP TO 3% PER ANNUM.

Improving children's nutrition also leads to wider social and economic gains. In the 2008 Copenhagen Consensus, eight of the world's leading economists, including five Nobel laureates, agreed that combating malnutrition was the best development investment.⁴²

While improving nutrition can have a positive impact on economic growth and development, the reverse relationship is not as straightforward – a growing economy does not guarantee an improvement in nutrition. New analysis by Save the Children found that there was not a significant correlation between the growth of a country's GDP each year and its average annual reduction in stunting.⁴³ The findings suggest that, although economic growth no doubt played a role in the reduction of stunting in some countries, a growing GDP in itself is not sufficient to guarantee a positive impact on nutrition. Between 1990 and 2009, the GDP per capita in Vietnam grew at an average rate of 6% per year and the percentage of children who were stunted fell from by nearly 4% each year. By comparison, in nearby Myanmar (Burma), GDP grew faster during the same period at 8% each year, but stunting reduced by only 1.5% each year – dropping from 46% in 1990 to the most recent rate of 41%.⁴⁴

As this comparison shows, economic growth alone is not the answer to the nutrition crisis. Additional country-specific solutions are needed to improve nutrition, especially for the poorest and most vulnerable children. The components of success in tackling malnutrition differ from country to country but are likely to include government policies and strategies that seek to improve nutrition, either by rolling out direct nutrition interventions (see chapter 2), or by introducing national schemes that target poverty (see chapter 3) or that integrate nutrition into agricultural policies and practice (see chapter 4). Underlying this is the need for political commitment to improving nutrition (see chapter 5).

Individual country success stories and national level data show that change is possible, and demonstrate that good policies and government leadership deliver results, even in the poorest countries. Bangladesh has achieved significant progress in reducing the prevalence of stunting, despite the fact that its economic growth has been slower than some of its richer neighbours. The proportion of stunted children fell from 68% in 1990 to 43% in recent years – a reduction of 3% per year,⁴⁵ which is one of the fastest in a low-income country (see page 15). Bangladesh's GDP per capita grew at a modest 3% annually during this period. The progress results from national nutrition programmes, implemented by the government of Bangladesh since the mid-1990s, to address the problem of malnutrition. Interventions included improving behavioural practices related to nutrition, protecting breastfeeding, implementing micronutrient supplementation programmes and improving food security in the poorest households. Despite this progress, Bangladesh must maintain its focus on nutrition, as the country's large population means it still has one of the highest burdens of child malnutrition globally – an estimated 7 million Bangladeshi children are stunted.

IN 2008 EIGHT OF THE WORLD'S LEADING ECONOMISTS, INCLUDING FIVE NOBEL LAUREATES, AGREED THAT COMBATING MALNUTRITION WAS THE BEST DEVELOPMENT INVESTMENT.

IN BANGLADESH THE PROPORTION OF STUNTED CHILDREN FELL FROM 68% IN 1990 TO 43% IN RECENT YEARS – A REDUCTION OF 3% PER YEAR, WHICH IS ONE OF THE FASTEST IN A LOW-INCOME COUNTRY

Bangladesh's example shows that significant progress is possible even in a low-income country. Save the Children estimates that if the rest of the world had been able to match Bangladesh's rate of progress on stunting since 1990, there would be 27 million fewer stunted children in the world today.⁴⁶

NUTRITION – KEY TO A GROWING ECONOMY: THE USA'S MILLENNIUM CHALLENGE CORPORATION AND INDONESIA

The government of Indonesia identified stunting as one of the major barriers to enabling the country to grow to have one of the strongest national economies in the 21st century. To address this, the USA government's Millennium Challenge Corporation will provide \$131.5 million over five years to reduce stunting in the crucial 0–2 age range by investing in the 1,000-day window from conception to a child's second birthday.

The Millennium Challenge Corporation was created as a model of development assistance to reduce poverty through economic growth. Using a strict series of metrics to select recipient countries and measure results – including a hard threshold for the economic rate of return on all projects – the Millennium Challenge Corporation focuses on the growth of people and economies.

STUNTING AND EQUITY

Economic growth will not necessarily reduce stunting unless it reaches the poorest and most vulnerable children and their families. Growth must be equitable so that increased wealth reaches the poorest and most vulnerable and makes an impact on the nutritional intake of those children who need it the most.

In the 20 countries where around 80% of the world's stunted children live, children from better-off families face a lower risk of stunting. However, rates of stunting are high across all wealth groups, from richest to poorest, which suggests that increased wealth is not enough to prevent stunting.

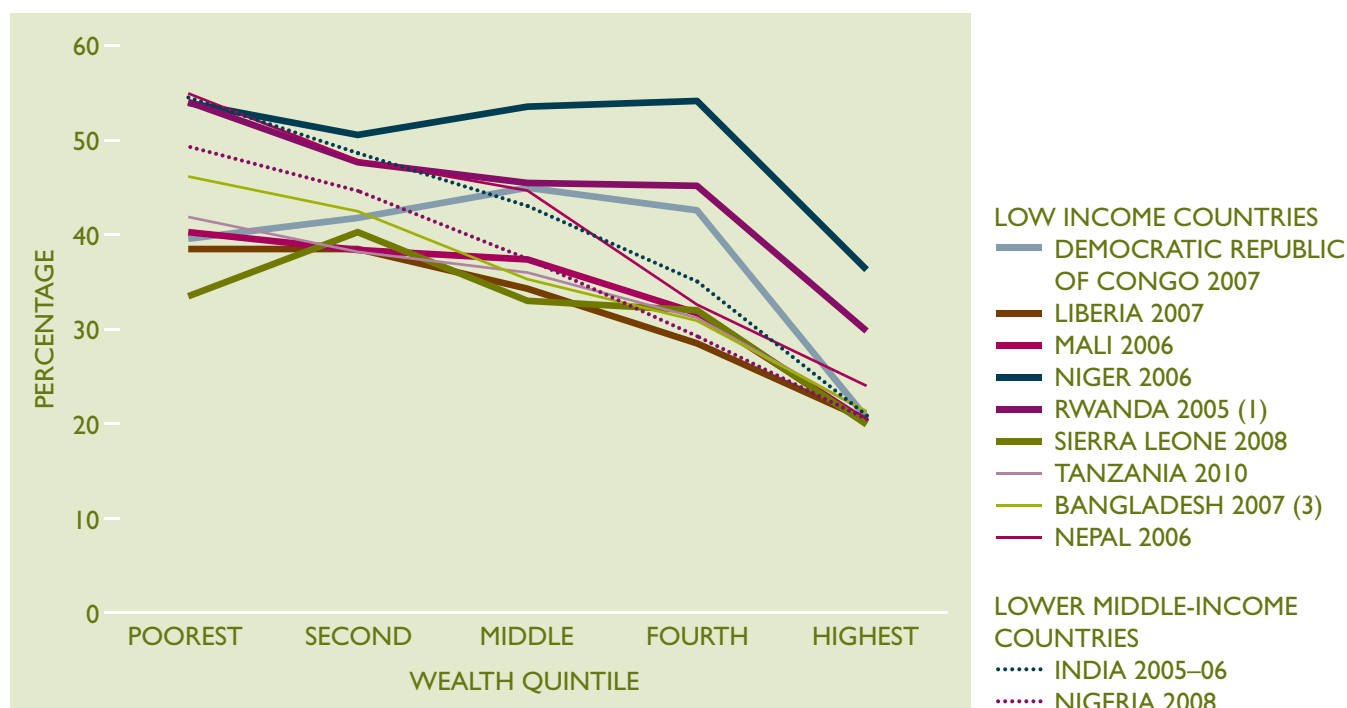
The trend is slightly different in low-income countries, such as Liberia and Tanzania, from lower-middle income countries, such as India and Nigeria. Figure 2 opposite divides the population of countries into fifths, according to the wealth of the household and compares the rate of stunting across these five income groups. Data from 2005 onwards

shows that in some low-income countries, such as Liberia, Mali and Tanzania, there is very little variation in stunting rates in the poorest three groups – or the poorest 60% of the population – within the same country, showing that stunting affects huge proportions of children. This suggests that in the poorest countries universal interventions to reduce stunting may be appropriate, as the problem affects the majority of the population. Save the Children has been working in countries with widespread malnutrition (eg, Bangladesh, Ethiopia, and Burkina Faso), using universal targeting methods.

While higher wealth relative to the rest of the population does indicate a lower risk of stunting, it is not sufficient to ensure the necessary reductions, and other interventions are needed. In richer families in these countries, interventions that increase knowledge about nutrition or that attempt to change certain types of behaviour may still be necessary.

In lower-middle-income countries, such as India and Nigeria, the picture is markedly different, with a larger gap between rich and poor. In Peru, for example, a child from the poorest fifth of the population is nine times more likely to be stunted than a child from the richest fifth. This indicates that in such countries, targeted interventions may be even more necessary.⁴⁷

FIGURE 2 STUNTING BY WEALTH QUINTILE IN SELECTED LOW-INCOME COUNTRIES⁴⁸





GOING TO BED HUNGRY

“We don’t have enough money. I eat dry *gari* [shredded cassava] once a day and, if I’m lucky, rice with butter and hot pepper once a day. We can’t afford to make sauce for the rice.

“When I go to sleep I always feel hungry.”

Ibrahim, 14, Freetown, Sierra Leone

SLOW PROGRESS, NO PROGRESS

Global progress on reducing stunting has been extremely slow. The proportion of stunted children fell from 39.7% in 1990 to 26.7% in 2010 – only 13 percentage points in 20 years or 0.65 percentage points per year. This equates to a reduction from 253 million stunted children in 1990 to 171 million in 2010.

Progress is even slower in Africa, which has seen an overall reduction of just 2% in 20 years from 40.3% in 1990 to 38.2% in 2010. In west Africa, stunting rates have stagnated at 38%. The slow rate of progress in Africa means that, because of population growth,

STUNTING IN ASIA AND AFRICA

South Asia has experienced a vicious cycle of stunting that passes from generation to generation, contributing significantly to its high numbers of stunting. A quarter of children in this region have a low birthweight of less than 2.5kg, which is a powerful predictor of stunting. This compares with 12% in sub-Saharan Africa.

Low birthweight indicates that a child's mother may be malnourished, which in turn suggests low status in society and in the family, and poor education levels. One report has found that if women and men had equal status in south Asia, with other related factors remaining unchanged, the percentage of underweight children would be reduced by 13 percentage points (from 46% to 33%) – roughly 13.4 million children.⁴⁹

In Africa, almost two in five children are stunted – a total of 60 million children. Nigeria alone accounts for 11 million of those. Among the economic variables significantly related to stunting is the percentage of the economy devoted to agriculture.⁵⁰ In Africa, the average yield of staple cereals is around one-third of those in Asia. The degree of mechanisation (eg, the use of tractors) in sub-Saharan Africa has shown barely any increase over the past 40 years.⁵¹ 16% of soil is 'low nutrient' in Africa compared to 4% in Asia.

In east Asia: Developing countries in East Asia sustained unrivalled growth rates in the 1980s and 1990s which led to significant declines in poverty. Improvements in human development – increased education, better healthcare, longer life expectancy – resulted in greater productivity, feeding into a virtuous cycle of growth and human development. This was recently dented by the Asian financial crisis, but since then there has been some degree of recovery. In contrast, growth and poverty reduction in sub-Saharan Africa have been slower, and progress against human development indicators varies greatly across the region.

IN AFRICA,
ALMOST TWO IN
FIVE CHILDREN
ARE STUNTED

THERE ARE NOW 15 MILLION MORE STUNTED CHILDREN IN AFRICA THAN IN 1990 – 60 MILLION IN TOTAL

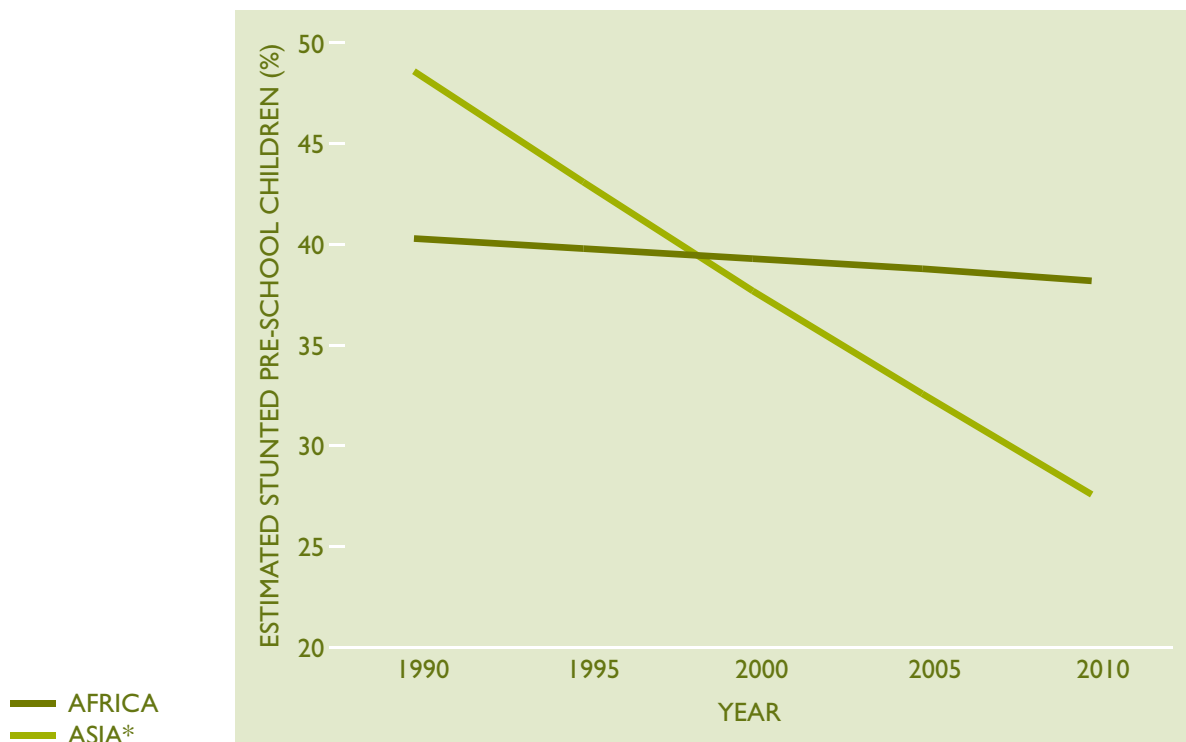
there are now 15 million *more* stunted children in Africa than in 1990 – 60 million in total.⁵² Essentially, there has been little progress on nutrition in Africa in a generation.

The number of African children who are stunted is predicted to continue growing. Research by Save the Children suggests that by 2020 it will be 8.5 million higher than today, and by 2025 this figure will have risen to 11.7 million higher.⁵³

Reductions in stunting in Asia, particularly east Asia and parts of south-east Asia, are responsible for the vast majority of the global decline in stunting. East Asia has shown the most rapid reduction, with the number of malnourished children falling by two-thirds between 1990 and 2010, from 35.9% to 12%, largely reflecting the rapid progress of China.⁵⁴

However, this is not representative of all of Asia. Progress has been slower in south Asia and much of south-east Asia (with Cambodia and Laos achieving much less than neighbouring Vietnam). Projections show that the prevalence of stunting is expected to fall by just a quarter (to 26%) in south-central Asia over the ten years to 2020, compared

FIGURE 3 PREVALENCE OF STUNTING IN AFRICA AND IN ASIA



*excluding Japan

Source: M de Onis et al, 'Prevalence and trends of stunting among pre-school children, 1990–2020', *Public Health Nutrition* July 2011, 14, 1–7

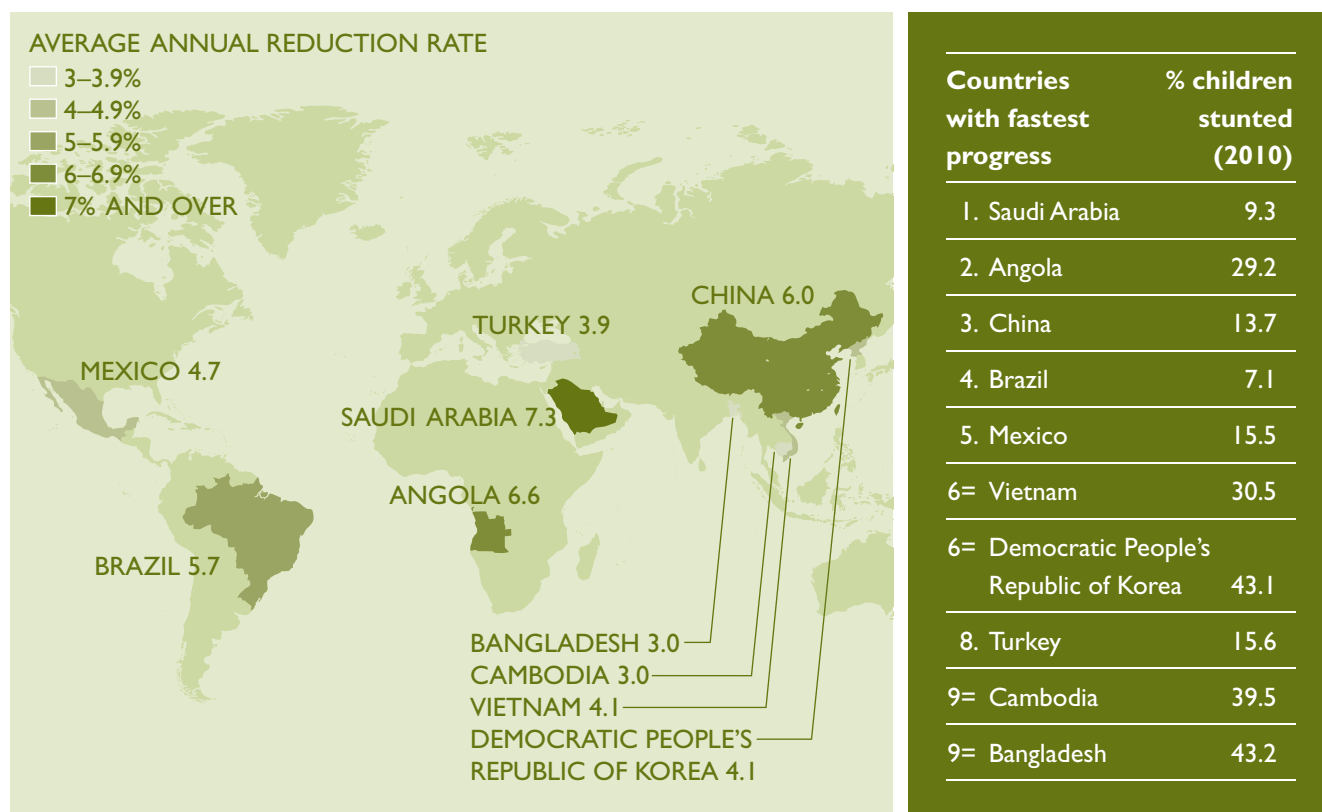
with a halving (to 6%) in eastern Asia.⁵⁵ The malnutrition rate for Asia as a whole in 2020 is predicted to be half the rate in Africa.

A Save the Children study⁵⁶ found that eight of the top ten countries with the fastest declines in stunting are in Asia, in line with the regional trends outlined above. Vietnam is reducing the number of stunted children by almost 4% each year; the number of stunted children has more than halved since 1990.

Six of the worst-performing countries have seen an increase in stunting rates. Nigeria is predicted to have 2.4 million additional stunted children by 2020 and Tanzania is expected to have 450,000 more children who are stunted.⁵⁷

Countries that have reduced stunting most quickly include many that have experienced strong and sustained economic growth. Of countries in the 'top five' ranking countries, Angola's economy has grown at an average of 11% per year since 2001,⁵⁸ while both Brazil's and Mexico's economies grew at around 5% annually since 1995. These five countries all saw annual reductions in malnutrition of at least 5% a year.

FIGURE 4 THE TEN COUNTRIES WITH THE FASTEST ANNUAL REDUCTION OF STUNTING BETWEEN 1990 AND 2010

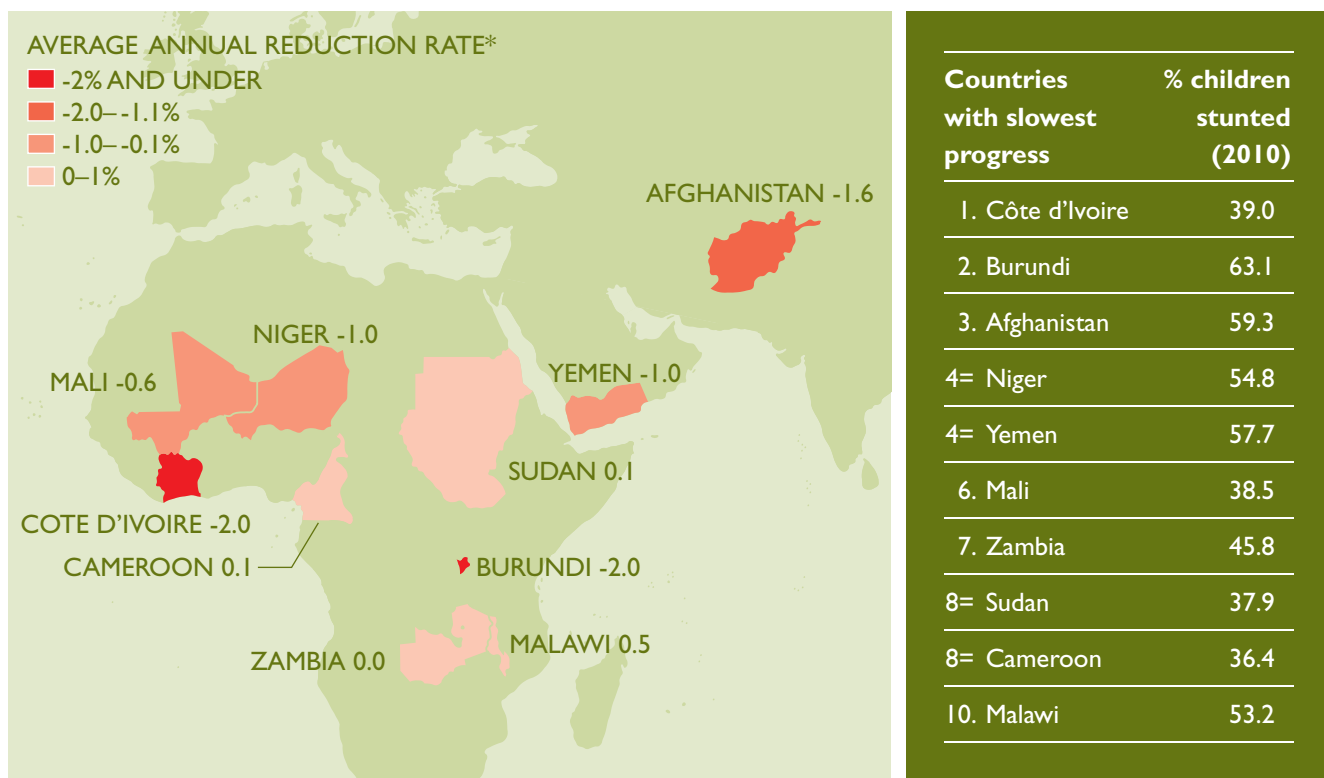


Source: Data came from Demographic and Health Surveys, Multiple Indicator Cluster Surveys or national nutrition surveys.

However, economic growth is not the only factor contributing to their success. For example, a World Bank report⁵⁹ found that strong economic growth in the 1990s only accounted for a small part of the reduction of undernutrition in Vietnam.

Many of the countries featured on Figure 4 (page 15) have strong public policies that aim to improve nutrition. Social protection schemes in Latin America and elsewhere have helped bring about big reductions in malnutrition among the poorest families. For example, Brazil's multi-sectoral Zero Hunger strategy includes an \$8bn conditional cash transfer scheme that reaches 46 million low-income Brazilians,⁶⁰ while Mexico has seen an impressive reduction in stunting as it rolled out a well targeted conditional cash-transfer programme.⁶¹ These schemes aim to improve the purchasing power of low-income families, which has been identified as one of the important steps to improving nutrition.⁶² Social protection – a key driver of reducing poverty and stunting – is examined in depth in chapter 3.

FIGURE 5 THE TEN COUNTRIES WITH THE SLOWEST ANNUAL REDUCTION OF STUNTING BETWEEN 1990 AND 2010



Countries with slowest progress	% children stunted (2010)
1. Côte d'Ivoire	39.0
2. Burundi	63.1
3. Afghanistan	59.3
4= Niger	54.8
4= Yemen	57.7
6. Mali	38.5
7. Zambia	45.8
8= Sudan	37.9
8= Cameroon	36.4
10. Malawi	53.2

* Negative reduction indicates stunting rate is increasing

Source: Data came from Demographic and Health Surveys, Multiple Indicator Cluster Surveys or national nutrition surveys.



PHOTO: PAOLO PELLEGRINI/MAGNUM PHOTOS FOR SAVE THE CHILDREN

Countries with rapid growth also need to invest in health services to ensure that well-trained health workers are able to deliver the interventions needed to improve nutrition, especially among the poorest and most vulnerable people (see chapter 2). In the space of a decade, Nepal, which would rank 11th on Figure 4 on page 15, has reduced the stunting rate among children from 57% to 41%. These gains have been associated with marked increases in access to antenatal care, immunisation coverage and exclusive breastfeeding. Sustained progress will be contingent on Nepal breaking down marked disparities linked to wealth, caste and region. The government also needs to equip the health system with the resources needed to tackle a national crisis in childhood and maternal anaemia.

The two countries that are doing worst in terms of progress against stunting, Côte d'Ivoire and Burundi, both experienced conflict and political upheaval. In Burundi, where 50% of the population was displaced between 1994 and 2001, research shows that children in areas affected by violence were more likely to be stunted than others, as crops were burnt and stolen, and furthermore this effect was greater where violence was prolonged.⁶³ Meanwhile in Côte d'Ivoire, the breakdown in public healthcare during the civil war that began in 2002 was followed by a drastic drop in coverage of several interventions, including immunisation and vitamin A supplementation, as well as exclusive breastfeeding.⁶⁴

In the occupied Palestinian territory nine-month-old Doha is suffering from severe malnutrition and anaemia. She is half the weight she should be. "My husband is unemployed and so is my father-in-law," says her mother, Olfat. "We don't have enough money to feed her. We don't have enough money to feed ourselves."



PHOTO: MADHURI DAS/SAVE THE CHILDREN

2 DIRECT INTERVENTIONS TO TACKLE MALNUTRITION

It's vital that the world acts urgently and decisively to tackle the crisis of malnutrition that blights the lives of millions of children – as chapter 1 sets out.

It's also realistic. The solutions that can provide the most immediate impact on children's health are already well known and documented. In 2008, world nutrition experts worked together to identify a group of 13 cost-effective direct nutrition interventions, which was published in *The Lancet* medical journal (see page 20). They estimated that if these nutrition interventions were scaled up to reach every child in the 36 countries that are home to 90% of malnourished children, approximately 25% of under-five deaths could be prevented. There would also be a substantial reduction in many illnesses.¹

This chapter outlines what can be done to improve nutrition at the most basic level through direct interventions that aim to improve the quality a child's diet and prevent infection. It looks at the importance of 'infant and young child feeding' – which addresses the majority of interventions in the first category of interventions (see page 20). And this chapter discusses fortification – which covers many of the interventions in the second category – and its potential to reduce micronutrient malnutrition.

The World Bank estimates the total cost of delivering 'the Lancet interventions' in full in the 36 countries that are home to 90% of the world's stunted children – and successfully mounting an attack on malnutrition – would cost approximately \$10.3 to \$11.8 billion annually.²

It is not just money that is needed. Many countries currently lack the capacity to immediately deliver nutrition interventions at the scale required. Delivering the Lancet interventions at scale requires a significant boost to human resources for nutrition – including investing in training more health workers – and to countries' institutional capacity to plan, cost and undertake the scaling-up of interventions. There is rarely strong leadership on nutrition within government ministries.³

INFANT AND YOUNG CHILD FEEDING

Of all preventive health and nutrition interventions, 'infant and young child feeding' – an umbrella term for the different activities involved in feeding a child from birth to the age of two – has the single greatest potential impact on child survival.⁴ Following the feeding practices set out in the box on page 23 helps give babies and young children protection from infections, and a healthy start in life.

The globally endorsed definition of optimal infant and young child feeding⁵ from the World Health Organization and UNICEF states:

"Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional needs, infants should receive safe and nutritionally adequate complementary foods while breastfeeding continues for up to two years of age or beyond."

Opposite: Diganta, age one, is fed by his aunt. Bangladesh.

THE 13 LANCET INTERVENTIONS

There is consensus among experts that the following interventions should be brought to scale in all contexts. They can be broken down into three main categories:

Interventions that encourage changes in behaviour to improve nutrition

1. promoting breastfeeding for newborns at delivery
2. promoting exclusive breastfeeding for the first six months through individual and group counselling
3. promoting the best foods and best ways to feed children between the ages of 6 to 24 months (known as complementary feeding as it is in addition to continued breastfeeding)
4. encouraging hand washing or other interventions that support better hygiene.

Micronutrient interventions

For infants and children:

5. increasing intake of zinc through supplementation,
6. giving zinc to manage diarrhoea (see box on page 30)
7. providing vitamin A through fortification or supplementation
8. universal iodization of salt

For pregnant or breastfeeding mothers:

9. improving nutrient intake through multiple micronutrients supplements
10. providing iodine through iodization of salt
11. providing iron folate supplementation
12. providing calcium supplementation.

Therapeutic feeding interventions

13. treatment of severe acute malnutrition (severe wasting) with special foods

The Lancet review identified a number of additional interventions including de-worming and insecticide-treated bednets that should be implemented in specific contexts based on risk factors.

THE WORLD BANK ESTIMATES THAT THE TOTAL COST OF DELIVERING THE LANCET INTERVENTIONS IN FULL WOULD BE APPROXIMATELY \$10–12 BILLION ANNUALLY.

OF ALL PREVENTIVE HEALTH AND NUTRITION INTERVENTIONS, 'INFANT AND YOUNG CHILD FEEDING' HAS THE SINGLE GREATEST POTENTIAL IMPACT ON CHILD SURVIVAL.

The 2003 *Lancet* series on child survival estimated that 1.3 million children's lives could be saved with universal (90%) exclusive breastfeeding for six months followed by continued breastfeeding for at least one year. In addition, 587,000 lives could be saved with adequate complementary feeding for children 6–24 months old.⁶ As well as reducing stunting, optimal breastfeeding could prevent 13% of all child deaths – more than any other preventive intervention – and complementary feeding could prevent an additional 6%.

The majority of children in the developing world are not being fed according to the well-established global recommendations on child nutrition. Just over one-third of babies in developing countries are exclusively breastfed up to the age of six months⁷ and even fewer children aged 6–23 months are fed a diverse diet.⁸

In Nigeria, 70% of all children – more than 5.5 million children – did not meet the three criteria for a minimum acceptable diet (see Table 3 on page 22).^{9,10,11} The latest available data for Pakistan shows that, in 2011, 96% of children aged 6–23 months – a total of more than 6 million children – ate only three different foods or less, two times a day or fewer.¹²

To save children's lives, nutrition in early childhood – and specifically infant and young child feeding – must be highly prioritised in national policies and strategies, and widely implemented.¹³ Improving feeding practices for infants and young children also makes economic sense. Poor breastfeeding practices can lead to higher healthcare costs for families due to increased child illness, and in the long term can increase the risk of chronic diseases and obesity. A low breastfeeding rate in a country increases infant illness, requiring mothers to miss work; families, employers and the economy are all




TABLE 2 FIVE COUNTRIES WITH THE LOWEST PERCENTAGE OF CHILDREN AGED 6–23 MONTHS RECEIVING A 'MINIMUM ACCEPTABLE DIET', AS DEFINED BY WHO

Includes all countries with relevant data since 2006

	Proportion of children receiving a minimum acceptable diet
Niger (2006)	3%
Pakistan (2011)	4%
Democratic Republic of Congo (2007)	4%
Mali (2006)	7%
India (2005/06)	7%

OPTIMAL BREASTFEEDING COULD PREVENT 13% OF ALL CHILD DEATHS.

TABLE 3 THE THREE CRITERIA FOR A MINIMUM ACCEPTABLE DIET FOR A CHILD AGED 6–23 MONTHS¹⁴

	Breastfed children	Non-breastfed children
Milk 	Given breast milk	Given milk, infant formula or milk products such as cheese and yoghurt
Frequency 	Fed at least twice a day at age 6–8 months and three times a day at age 9–23 months	Fed at least three times a day at age 6–8 months and four times a day at age 9–23 months
Diversity 	Fed at least three different food groups	Fed at least four different food groups

affected. In addition, using formula or other breast milk substitutes involves additional costs and workload for households. Improved complementary feeding interventions improve nutrition and can therefore have a significant effect on adult wages through improved physical work capacity, more schooling and improved cognitive skills, which in turn has a positive impact on income.^{15,16}

CHALLENGES AND OPPORTUNITIES

There is consensus on what works in improving feeding for babies and young children. The focus now needs to be on translating these findings into action through large-scale nutrition programmes in the countries with the highest numbers of stunted children. This requires investment in the ‘delivery science’ – in other words, how to develop and deliver programmes and monitor and evaluate them rigorously to find out not just what works, but how it works and who it works for.¹⁷

Nutrition experts and the international institutions and agencies that work to reduce child malnutrition know the solutions that work and have the evidence to prove it. They and the governments that they work with or that support them have made a series of high-level political commitments and investments to improve nutrition – for example, the Millennium Development Goals, the L’Aquila Food Security Initiative and the Scaling Up Nutrition movement (see chapter 5). The world is now poised to narrow the gap between evidence and practice and to deliver upon these commitments.¹⁸

ESSENTIAL BREASTFEEDING AND COMPLEMENTARY FEEDING PRACTICES

Essential behaviours for exclusive breastfeeding

A mother practices optimal breastfeeding during the first 6 months when she:

1. Initiates breastfeeding within 1 hour of birth.
2. Feeds the colostrum to the baby.
3. Positions and attaches the infant correctly at the breast.
4. Breastfeeds on demand.
5. Breastfeeds frequently during the day.
6. Breastfeeds during the night.
7. Offers second breast after infant empties the first.
8. Gives only breastmilk; gives no water or teas or any other liquids or foods.
9. Continues breastfeeding when she is sick.
10. Increases breastfeeding frequency during and after infant's illness, including diarrhoea.
11. Seeks help from a trained health worker or counsellor if she has problems with breastfeeding.
12. Eats sufficient nutritious foods herself and takes supplements as recommended by the health provider.

Essential behaviours for complementary feeding

A mother practices optimal complementary feeding during the period 6–23 months of the infant's life when she:

1. Starts feeding additional foods to the child at the age of 6 months.
2. Starts with soft or mushy foods at first that are age appropriate and are not too thin or thick, and gradually shifts to foods of a solid consistency if the child is ready.
3. Continues breastfeeding up to 2 years of age or beyond.
4. Offers solid or semi-solid foods 2–3 times per day when child is between 6–8 months of age, and 3–4 times per day after that, and offers nutritious snacks 1 or 2 times per day, as desired.
5. Offers a variety of foods, from all the food groups (grains, roots and tubers, legumes and nuts, animal source foods and fruits and vegetables) and increases in variety and quantity as the child grows.
6. Practices good hygiene in preparation and storage of complementary foods (including washing hands before and using clean water and utensils).
7. Continues breastfeeding and feeding complementary foods during illness.
8. Gives the child iron-rich foods such as animal source foods or iron supplements if iron-rich foods are less available.
9. Uses feeding times for interacting with the child, to teach and stimulate social development as well as encouraging the child to eat.

Source: UNICEF (2011) *Programming Guide: Infant and young child feeding*

Barriers

There are many reasons for the lack of coverage of interventions to improve infant and young child feeding – let alone coverage that is good quality. Two of the most significant reasons are the global health worker shortage and persistent gender inequities.

The health worker shortage: Significant progress has been made in reducing child deaths, in large part due to the work of trained frontline health workers.¹⁹ However, these reductions don't necessarily translate into improvements in nutrition or in infant and young child feeding practices, especially when the focus is on prevention. It is widely recognised that there is a global shortage of at least 3.5 million frontline health workers and that around 1 billion people never get to see a health worker.²⁰ Doctors, nurses, midwives and frontline community health workers are often overburdened and poorly trained, poorly deployed and poorly supported.

ETHIOPIA'S HEALTH EXTENSION WORKERS

The Health Extension Programme in Ethiopia is designed to bring healthcare to communities and households. Two health extension workers (HEWs) are assigned to a health post, covering a population of about 5,000. They are supported and supervised, with a ratio of one supervisor for every ten health extension workers.

Health extension workers are expected to deliver a wide range of preventive health and nutrition interventions, as well as promoting good practices, and offering limited curative treatment. However, although infant and young child feeding and women's nutrition in pregnancy are included in the package, they do not generally get the time to provide this, given the breadth of their work. And even when mothers do have adequate contact with health workers, researchers have found that breastfeeding practices are not always optimal.

Stepping up training and support

Frontline health workers need to be better supported and trained to effectively promote optimal infant and young child feeding. When they are properly trained and supported, they can successfully support and counsel mothers to improve breastfeeding practices. However, this has not been done consistently or on a large enough scale.

Health worker training should include an emphasis on counselling skills and on supporting mothers to help establish and maintain good breastfeeding practices.

Source: Alive and Thrive, 'Early initiation of breastfeeding', Technical Brief, 1 January 2010

Gender inequities: the poor status of women is a key underlying factor in maternal and child feeding practices, and in child malnutrition. The care for pregnant and lactating women is often inadequate. Other key issues affecting many women include lack of education, poor self-confidence, low economic status and a workload that allows little time for altering practices to improve nutrition. To be effective, programmes may have to address a range of factors affecting the care-giving environment and household dynamics, such as women's workload.²¹

PROMOTING BREASTFEEDING TO MILLIONS IN MADAGASCAR

In Madagascar, exclusive breastfeeding rates rose from 42% to 70% from 2002–05. One project – the Linkages project, run by AED (the Academy for Educational Development) and USAID – focused on scale and sustainability and reached 6.3 million people.

Governments and organisations have looked to learn from the success of the Linkages project, and to apply this to their own programmes.

How did it work?

The project saturated communities with uniform messages. A number of different approaches were used, including:

- At health centres and during home visits, health workers and volunteers promoted breastfeeding.
- Messages and materials about breastfeeding were based on research and were tested to ensure they were relevant. They were then disseminated through print materials, at community events and through radio campaigns.
- The programme piloted innovative schemes, such as a campaign to make workplaces 'baby-friendly'.
- A popular singer – who was breastfeeding her own child at the time – became a spokesperson.

The groundwork was laid early among many partners. A national multi-sector nutrition action group – with representation from 50 organisations, including government, universities, NGOs, and media – was established. The advisory group updated policies and guidance, and developed advocacy presentations on feeding and nutrition for babies and young children for various audiences.

Creating an overall positive policy environment for nutrition – through policy analysis and advocacy – was essential to building a coalition, getting partners to support the programme's approach, and to mobilise resources. A number of factors enabled the project to work at scale:

- networking and creating a shared vision among the members of the coalition
- building on existing programmes
- harmonising messages
- providing short, practical training for health workers and community health workers.

THE 2008 COPENHAGEN CONSENSUS RANKED MICRONUTRIENT FORTIFICATION AND BIO-FORTIFICATION AS THE 3RD AND 5TH MOST COST-EFFECTIVE OF ALL DEVELOPMENT INTERVENTIONS.

FOOD FORTIFICATION

While food fortification is not a ‘silver bullet’ solution to tackling malnutrition, it is a relatively simple, cost-effective and often sustainable intervention with powerful potential to tackle micronutrient deficiencies. Through strong collaboration between governments, NGOs and the private sector, different forms of food fortification provide the ability to target different micronutrient deficiencies in all or specific segments of the population, including children under the age of two.

In its basic form, fortification is the process of adding vitamins and minerals to food to boost the amount of a particular micronutrient.²² It has been a standard practice in many rich countries for decades – the first salt was iodised in Switzerland in 1922 and the first flour fortified with iron in the 1940s.²³ In 2009, around a third of the world’s flour produced in large roller mills was being fortified with iron, folic acid and, in some cases, other micronutrients.²⁴ In fact, fortification is so common in developed countries that it often goes unnoticed. A visit to most supermarkets will reveal that breakfast cereals, complementary foods or bread often contain added vitamins and minerals.

Fortification can be a cost-effective nutrition intervention and has a high rate of return on investment. The 2008 Copenhagen Consensus ranked micronutrient fortification and bio-fortification as the 3rd and 5th most cost-effective of all development interventions.²⁵ For example, at an estimated annual cost of \$0.5 billion, universal salt iodization would save an annual \$35.7 billion of potential costs attributable to iodine deficiency,²⁶ which is the world’s most prevalent, yet easily preventable, cause of brain damage.²⁷ Annual investments of around US\$4.5 billion would see more than 4.1 billion²⁸ more people receiving access to fortified wheat, iron, complementary food and micronutrient powders²⁹ – costing just over US\$1 per person per year.

TYPES OF FORTIFICATION

The type of fortification programme that will be most appropriate and effective in each country or community will depend on a range of factors, including:

- who is lacking which micronutrients
- poverty levels
- accessibility of the target population
- the nature of traditional diets
- the available infrastructure
- the nature and capacity of food processing and production systems.

There are four types of fortification, which are explained in Table 4 (opposite). Each of these forms of fortification is examined further below.

TABLE 4 OVERVIEW OF FOOD FORTIFICATION INTERVENTIONS

	Intervention	Target population	Delivery mechanism	Additional resources required to scale up (per annum)	Number reached through scale up	Benefit: cost savings, cost effectiveness or impact*
<p>Mass or universal fortification is the process of adding vitamins or minerals to foods that are widely consumed by the general population during industrial production and processing. Staples like flour and rice or condiments like soy and fish sauce are regularly fortified.</p>	Iron fortification of staples (eg, flour, oil, condiments)	Entire population	Market systems, social marketing	US\$599 million	3 billion	8:1
	Salt iodisation	Entire population	Market systems	US\$80 million	1.2 billion	30:1
<p>Bio-fortification is the development of staple food crops that have increased amounts of micronutrients when they are grown.</p>	An example is the large-scale introduction of orange-flesh sweet potato that is rich in vitamin A in Mozambique	Entire population	Market systems; subsistence farming	Not costed	N/A	Led to a 63% increase in vitamin A for children aged 6–35 months, 169% for children aged 3–5.5 years and 42% among women. The new crop variety provided 80% of total vitamin A intake ³⁰
<p>Commercial or market-driven fortification involves food companies voluntarily fortifying products, such as cereals or porridge for infants and young children, within regulatory limits set by the national government.</p>	Fortified complementary foods	Children aged 6–24 months	Market systems	US\$3.6 billion	72 million	US\$500–1,000 per disability-adjusted life-year saved
<p>Home and community fortification involves providing families with products, in the form of powders, tablets or spreads that are added to or supplement traditional foods cooked in the home at the point of preparation.</p>	Multiple micronutrient powders	Children aged 6–24 months and pregnant women	Community nutrition programmes; health system; market systems	US\$216 million	34 million	37:1

Source: World Bank, *Scaling up Nutrition: What will it Cost?*

*The benefit:cost or cost-effectiveness column shows the estimated benefits of reducing malnutrition in terms of reductions in deaths and healthcare costs, as well as economic returns through increases in productivity and educational attainment, verses the initial cost of the intervention.

MASS FORTIFICATION

Mass fortification is a cost-effective intervention that uses the country's existing food delivery system. As production is generally large scale, the price increase for the consumer is small. In fact, analysis from the World Food Programme, using Save the Children's *Cost of Diet* tool, shows that, in Mozambique, flour fortification lowers the price of the minimum cost nutritious diet by 12%, and fortified maize flour lowers family food expenses by up to 18%.³¹ The fortification of staple foods that are widely consumed by the general population means that poorer and more remote communities are likely to benefit. It does not require families to change what they eat or how they prepare it.

Mass fortification programmes are increasingly common, especially when it comes to fortified flour and iodised salt. Between 1990 and 2009, for example, the number of households in developing countries consuming iodised salt rose from 20% to 70%. This coincided with a 43% (110 to 47) reduction between 1993 and 2007 in the number of countries in which iodine-deficiency disorders were a public health concern.³² Other programmes have also been successfully undertaken through a range of foods (including rice, cooking staples, such as sugar and oil, and condiments, such as soy and fish sauces), with demonstrated impact.³³

The downside of mass fortification is that infants and young children, who have high micronutrient needs but consume relatively small amounts of staple food, are less likely to obtain the recommended intake this way. However, it can contribute to better

FLOUR POWER IN SOUTH AFRICA

The most effective mass fortification programmes are usually those initiated and regulated by national government.³⁴ In 2003, for example, South Africa launched its National Food Fortification Programme, mandating manufacturers to fortify bread wheat flour or maize meal with eight micronutrients including vitamin A, folic acid, iron and zinc.

An impact study found a two-thirds reduction in perinatal (foetal or neonatal) deaths related to neural tube defects (an opening in the spinal cord or brain that occurs very early in human development), and a 39% reduction in neural tube defect-related infant mortality.³⁵

BETWEEN 1990 AND 2009 THE NUMBER OF HOUSEHOLDS IN DEVELOPING COUNTRIES CONSUMING IODISED SALT ROSE FROM 20% TO 70%

nutrition for adolescent girls, whose rapid period of growth is second only to the first year after birth and to women before they conceive. Babies born to adolescent girls are more likely to die before their fifth birthday. This is just one more reason it is critical for governments and communities to work to delay early marriage and pregnancy. However, given that this is the reality for many girls in various parts of the world, it is also critical that mass fortification is included in a national nutrition strategy to improve the access of adolescent girls to iron, iodine, vitamin A, zinc and folic acid. These micronutrients enable healthier pregnancies, better birthweights and the transmission of micronutrients to infants through breastfeeding. The consumption of iodised salt, for example, reduces the negative effect on the brain and nervous system of unborn children and infants through improved consumption of iodine.

BIO-FORTIFICATION

Bio-fortification is the development of staple crops that are rich in micronutrients through traditional or conventional agricultural breeding practices or through modern biotechnology, which make plant foods more nutritious when they are grown. Programmes have been initiated to increase the levels of iron, zinc, vitamin A and beta-carotene in a number of staple crops grown in areas of high subsistence farming, including sweet potato, bean, pearl millet, cassava, maize, rice and wheat.³⁶

Research and development in this area has identified a number of advantages.³⁷ The primary advantage is that it targets poor families living in remote rural areas that can grow, consume and sell their own fortified crops (potentially stimulating the local economy and securing livelihoods). After a one-off investment in seed development, bio-fortification is less susceptible to social and economic changes, has low recurrent costs and has significant potential to be replicated at scale because the knowledge can be shared internationally.³⁸

It is suggested that bio-fortification could potentially provide up to 50% of the estimated average requirement of iron, zinc and vitamin A for children over four, adolescents and adults.³⁹ But, as with mass fortification, it relies on the consumption of a large amount of staple foods. It should therefore be considered as part of a broader package that prioritises the fortification of complementary foods and home fortification when targeting children in the vital window of the first 1,000 days.

There is only limited implementation research that has looked at adoption and use of these varieties in developing countries. Bio-fortification is an area that would benefit from further research, including into whether farmers would accept the new technology and whether consumers would buy and eat bio-fortified foods.⁴⁰

ESSENTIAL ZINC

In children, zinc is vital for brain development, physical growth and for the immune system.

Zinc deficiency, which is widespread, is a cause of stunting in children and impairs cognitive development. According to the World Health Organization, zinc deficiency is one of the leading risk factors associated with the common killers of children in developing countries, including diarrhoea, pneumonia and malaria. Diarrhoeal disease alone contributes to the deaths of 450,000 children under the age of five each year.

Zinc deficiency is typically the result of inadequate dietary intake, as children in the developing world have mainly plant-based diets, which are often low in zinc. Diseases or conditions that involve intestinal mal-absorption, such as diarrhoea, can also contribute to zinc deficiency.

Ensuring that children receive adequate zinc has the potential to save many lives and improve the growth and development of children.

COMMERCIAL FORTIFICATION

Food fortification can be achieved⁴¹ by using the expertise of private sector food companies to develop, produce and distribute fortified products. If food companies routinely fortified their products (including cereals and porridge for infants over six months of age) in developing countries, as they have been doing in rich countries for years,⁴² families would have access to an increased range of nutritious food available in shops and markets.

There is, therefore, a clear role for industry-driven fortification of complementary foods for children aged 6–24 months, for example, through public-private partnerships. In Côte d'Ivoire, for example, a local company called Protein Kisèe-La (PKL) is working with the Global Alliance for Improved Nutrition (GAIN) and the Helen Keller International to improve the micronutrient content of its fortified infant cereal, *Farinor*. The partnership aims to reach up to 1 million infants.⁴³

However, commercial fortification has its limitations as products must be low-cost, high-quality, and widely available on local markets to have maximum impact. It is crucial that the marketing and packaging of products is in strict compliance with the International Code of Marketing of Breast-milk Substitutes⁴⁴ and that they do not undermine breastfeeding practices.⁴⁵ Care should also be taken to ensure that these products do not lead to a reliance on more expensive packaged and processed foods where adequately nutritious and affordable traditional foods are available locally.

MICRONUTRIENT POWDERS HAVE DEMONSTRATED A 31% REDUCTION IN ANAEMIA AND A 51% REDUCTION IN IRON DEFICIENCY IN CHILDREN UNDER TWO.

HOME FORTIFICATION OF COMPLEMENTARY FOODS

Home fortification is the best solution to reach infants aged 6–24 months. Innovations in home fortification – first with multiple micronutrient powders (MMPs) and more recently with lipid-based nutritional supplements (LNS) – are presenting exciting opportunities to tackle malnutrition, reduce stunting and protect against disease.

Multiple micronutrient powders

Multiple micronutrient powders are typically produced in the form of sachets containing powder with iron and micronutrients that are sprinkled onto food. The original purpose of *Sprinkles*, as they were originally branded, was to provide iron and other nutrients for treating anaemia and iron deficiency.⁴⁶ Since then the exact formulations have been improved to provide the complete recommended nutrient intake for children aged 6–59 months.⁴⁷

Multiple micronutrient powders come in single-dose sachets and cost around three US cents per packet.⁴⁸ They are designed to be added directly to foods prepared at home without affecting the taste or colour of the food. They are currently distributed through the health system, community nutrition programmes and markets. Large-scale distribution has been limited to a small number of countries thus far,⁴⁹ but the number of sachets bought and supplied by UNICEF and the World Food Programme (WFP) increased from just over 50 million in 2008 to around 350 million in 2010.⁵⁰

Home fortification is recommended where children have low dietary diversity, or when locally available foods have little nutritious value. They are also recommended when a child has infectious diseases such as malaria or diarrhoea, as well as worm infestation, which prevents their body from absorbing micronutrients properly – conditions that are widespread in poor households in developing countries.⁵¹

Home fortification using multiple micronutrient powders is a cheap, affordable and effective intervention, with the ability to reach young children in remote communities. They have demonstrated a 31% reduction in anaemia and a 51% reduction in iron deficiency in children under two.⁵² Multiple micronutrient fortification was found to increase school attendance because children were less likely to be absent due to illness and disease, thereby improving children's life chances and their ability to fulfil their social and economic potential.⁵³

The World Health Organization has said that MMPs are very cost effective.⁵⁴ This is evidenced through research from the World Food Programme, using Save the Children's *Cost of Diet* tool, which found that the addition of two sachets of MMPs to the diet in Indonesia would reduce the amount that families would need to spend to obtain an adequately nutritious diet by 20%.⁵⁵ MMPs that contain iron have found that the benefit to cost ratio is 37:1,^{56,57} meaning that an annual investment of US\$216 million (which would reach an additional 34 million children) is a bargain development buy.



“MY DAUGHTER IS WEAK AND ALWAYS PALE”

“My oldest daughter, who is seven, is weak and always pale. She’ll be eating and then she’ll just collapse. I took her to the doctor one year ago and he told me she was anaemic. He gave us drugs and told us to come back and do the test again some months later. But I wasn’t working then and I couldn’t afford the second test.

“Her face and hands are still pale and yellow, and sometimes she falls when she’s playing. The doctor told me it was malnutrition. It’s our lack of money and the fact that food doesn’t have as many vitamins as it used to. I’m paid only 150 pounds a month and I can’t afford to give them the healthy food they need.”

Warda, Egypt

INNOVATION IN CHINA

New MMPs are currently being developed in China (*Ying Yang Bao*) that are designed to increase the energy density of the diet through the inclusion of full fat soy and yellow bean powder. Early stage trials on children under two in Gansu province, and in Sichuan province, following the earthquake, have shown significant improvements in anaemia, stunting, weight and development/IQ scores, compared with children receiving energy but no micronutrients, and those children receiving no intervention at all.⁵⁸ This recent development, which impacts on growth as well as micronutrient status, is another exciting area of development.

Ready-to-use supplementary foods

The latest advancement in fortification is a type of ready-to-use supplementary food (RUSF) that is dense in energy from essential fats as well as containing recommended micronutrients.⁵⁹ Also known as lipid-based nutrient supplements (LNS), they are usually pastes made from oil seed or peanuts that are enriched with nutrients and produced in single-serving packets. These products were first developed following the success of a similar ready-to-use packet food that is distributed in emergencies to treat children at risk of starvation. The use of high-nutrient peanut paste has revolutionised the treatment of severe acute malnutrition in emergencies over the last decade by shifting the focus of treatment from hospitals to communities.

Current formulations of RUSF are very similar to the ones used in emergencies.⁶⁰ They provide the full recommended intake of micronutrients and, due to their essential fat content, are also used to increase children's weight, prevent illness and promote growth and development. Despite the ability to improve the diets of mothers and young children, RUSF must be used to complement rather than replace locally produced nutritious food, and the marketing and application of RUSF must not negatively impact breastfeeding practices.

The first LNS trial, published in 2007, found that it had strong impact on growth (weight and length for age) and that it doubled the number of children who were able to walk by their first birthday.⁶¹ Although the evidence base for the use of LNS in non-emergency contexts remains limited, trials are showing the impact that these products can have on stunting has promise.

This significant development takes home fortification to the next level, enabling international agencies and NGOs to treat infants in a preventative capacity prior to the situation escalating. However, at a cost of between US\$0.11 and US\$0.35 per dose,⁶² LNS are affordable to international institutions, and some governments, although they remain expensive for poor families.

Increasing local production of LNS is likely to increase competition and reduce the transportation costs of raw materials. Airfreight, for example, can contribute up to 39% to the final cost of the product.⁶³ However, the limitation to LNS is that it is a new product and there are no category standards for the product in most countries to allow for registering local production.

OVERCOMING BARRIERS AND EXPLORING OPPORTUNITIES

Evidence and guidance gaps

There is still little internationally accepted programmatic guidance around the use of RUSF and fortified complementary foods. The time lag between the rapid development of products and the publication of guidance on their composition and delivery has delayed the scale up of food fortification. Governments, donors and the international community should look to play a more active role in developing policies and quality assurance frameworks to guide the way that multiple micronutrient powders and LNS are distributed through health and nutrition programmes in non-emergency settings. Bringing research and evidence into policy-making and programme design will not only protect consumers, but will ensure co-ordination and the ability to scale up with confidence.

Legislative barriers

Appropriate national regulation⁶⁴ is necessary to increase fortification and to protect consumers. However, government bureaucracy and country-specific laws, where they are outdated and not aligned with current evidence and developments on MMPs and LNS, also impose barriers⁶⁵ to entry for new products fortified with micronutrients. National food laws and regulation can also create barriers to large-scale implementation of food fortification programmes.

To avoid unnecessary barriers to the effective manufacture or distribution of fortified foods, governments should work to ensure that laws and regulations create an enabling environment through the provision of clear and unambiguous guidance that is sufficiently flexible to meet evolving developments in food fortification.

Government support for these interventions to approve manufacturing and distribution of products is important, although this must be matched with the ability to monitor and enforce legislation to protect consumers. Strong regulation that is well enforced should ensure that poor families are able to access highly nutritious and fortified food products that complement local food production and do not undermine breastfeeding practices.

LEGISLATIVE BARRIERS IN BANGLADESH

In Bangladesh, fragmented food regulation laws created unnecessary barriers to more widespread and effective food fortification. There is very little specific legislation dealing with food fortification to guide manufacturers and importers on fortification practices or national standards in Bangladesh. The food control and safety regulation that exists is complex, being operated by a number of different government institutions.⁶⁶

These complexities have already hindered three companies, DSM,⁶⁷ SMC and Renata, in achieving widespread distribution of their respective MMPs: *MixMe*, *MoniMix* and *Pushtikona*. Bangladeshi regulation meant that their products were classified as pharmaceutical rather than food products, restricting their sale to pharmacies. Delays of up to a year were also encountered when Renata wanted to introduce a new 15-micronutrient powder, more closely aligned with international guidance, rather than the one that only contained five micronutrients.⁶⁸

Price barriers

Fortification increases the cost of producing food, which will generally be carried by consumers or international agencies. The key challenge is to find the best way to reach the poorest households with fortified foods that are affordable, accessible and acceptable. In most cases, targeted fortification of staple foods in combination with home fortification, accompanied by appropriate pricing, marketing and communication, will ensure the greatest coverage and consumption by the poor.

Market-based interventions may not be able to achieve large-scale results at affordable prices, as the high costs of centralised processing, packaging, marketing⁶⁹ and quality assurance of premium-branded products means that poor people are not able to afford them. Given the high costs of the raw materials, it is unlikely that there will be commercial potential in the foreseeable future for providing preventative lipid-based nutrient supplements at low enough prices to attract consumers from poor countries.

The challenge for the private sector is to create viable business models that enable the poorest people to access fortified products at an affordable price.

Cultural practices

As well as technical and cost barriers, home fortification is hindered by practical barriers related to product acceptability. Adding a powder in a sachet when preparing food, for example, is very unfamiliar to most people, especially when such products are not yet available on local markets. Furthermore, given that the effects of micronutrient deficiencies are often 'hidden' and the visible benefits are intangible, it may be difficult to encourage mothers to regularly use fortified products in the home.⁷⁰ Many mothers and caregivers are likely to need guidance and encouragement before they willingly incorporate fortified products into their diets.⁷¹ Nutrition education needs to accompany any use of these products to ensure they are used correctly.

CONCLUSION

The direct interventions outlined in this chapter hold the key to making significant and immediate improvements to the nutrition of children. If the 13 interventions outlined at the start of this chapter were scaled up to reach 99% of children in the 36 countries that are home to the vast majority of malnourished children, approximately 25% of under-five deaths could be prevented and there would be a substantial reduction in many illnesses.⁷² These interventions rely on a strong functioning healthcare service with sufficient numbers of health workers who are trained in nutrition.

Ensuring that children are fed optimally could make a huge difference to the number of children who are stunted. Infant and young child feeding practices, which include breastfeeding and taking steps to ensure children are fed enough times each day with enough different food groups, will have a huge potential impact on child survival.⁷³ Efforts to support mothers to breastfeed and provide the right mix of complementary foods to their children are vitally important.

Fortification can address many of the micronutrient deficiencies that children suffer. But they are not a silver bullet. Fortification must be tailored to a country's specific context and any intervention to fortify food must support and enhance the government's longer-term nutrition strategies⁷⁴ – which should include the 13 direct interventions outlined above – in a cost-effective way without causing harm. When these principles are adhered to, food fortification can play an important and cost-effective role in reducing malnutrition. All forms of fortification have demonstrable impact on pregnant and lactating women, adolescent girls, children and infants. However, home fortification and the fortification of complementary foods hold the greatest potential for reducing micronutrient deficiencies and disease burden in children under two.

Although fortification was highlighted in this report, all of the direct interventions are important. Save the Children's nutrition work will focus in more depth on these other interventions in the future.

RECOMMENDATIONS

- **Develop a national minimum package of direct nutrition interventions:** National governments, supported by donors, must develop and implement an adequately resourced national minimum package of direct nutrition interventions for all children, and for all women who are of childbearing age, pregnant or breastfeeding, particularly adolescent girls.
- **Produce better quality data on nutrition:** Governments and donors should increase efforts, in close collaboration with nutrition experts, to produce more frequent and better quality data on which to improve the mapping and targeting of nutrition-related interventions, such as infant and young child feeding and micronutrient deficiencies.
- **Support health workers to promote nutrition:** Governments and donors need to support and train health workers to give them the capacities needed to deliver good-quality nutrition interventions, including counselling skills and optimal breastfeeding practices. They should be supported by specialist nutrition experts.
- **Promote fortification of food at home with multiple micronutrient powders:** Governments, donors and the international community should actively increase the development of evidence-based policies, frameworks and guidance on the design, use and distribution of multiple micronutrient powders and lipid-based nutrient supplements, including in non-emergency settings, in recognition of the potential effectiveness of this intervention in reaching children under two.
- **Create the right policy environment for food fortification:** Governments must ensure that laws and regulations create a policy environment that works for fortification. This includes ensuring regulations give clear guidance that is sufficiently flexible to meet developments in food fortification, while at the same time maintaining protection for consumers and equitable access. Donors should provide development assistance that improves the capacity of governments to develop and enforce appropriate regulations on food fortification.
- **Invest in the local production of fortified supplementary foods:** Donors, governments and the private sector should increase investment in local businesses to diversify the supply base for ready-to-use supplementary foods, and to increase competition through the use of locally grown raw materials.



PHOTO: AMY REED/SAVE THE CHILDREN

3 SOCIAL PROTECTION AND NUTRITION

Poverty is a main underlying cause of malnutrition. Children are malnourished not simply because there is no nutritious food available, but because their families cannot afford to buy it. Save the Children's research shows that a significant proportion of families in selected communities in Bangladesh, Ethiopia and Kenya could not afford to feed their families a nutritious diet even if they spent all of their income on food.¹

Rising food prices are putting nutritious food further out of reach. The World Bank estimated that an additional 44 million people might have been pushed into poverty as a result of food price rises since June 2010.² When food prices skyrocket, children feel the effects in their daily diets, and their nutrition suffers.³ (See box on food prices on page 40.)

Providing poor families with cash or other benefits – social protection – cushions them from the most devastating effects of long-term poverty and of economic shocks, such as fluctuating food prices.⁴ Social protection schemes have been gaining global momentum in recent years and are playing an important part in reducing poverty in many countries. Latin American countries, like Brazil and Mexico, were the trailblazers for these initiatives in the last decade. Following the effectiveness and popularity of social protection schemes in those countries, similar initiatives have now been introduced in low-income countries such as Ethiopia and Bangladesh. And the potential impact of social protection is growing, with China, India and Nigeria – the countries with the first, second and seventh largest populations – considering introducing programmes for the first time.

The growth in social protection is founded on a strong evidence base. Studies show that social protection can contribute significantly to economic growth and productivity.⁵ By generating long-term benefits in adulthood, social transfers can improve children's lifetime opportunities, help tackle long-term, chronic poverty⁶ and break the intergenerational cycle of poverty.

What is more, social protection policies are affordable. Save the Children cost estimates found that child and maternal benefits are feasible on a large scale, even in developing countries. In middle-income countries and many Asian countries, universal benefits for pregnant women and children under five are affordable. In low-income countries, although universal transfers are generally unaffordable without external assistance, child and maternal benefits are possible with an appropriate mixture of age-based and geographical targeting. Gradual expansion by age or geography will help to keep costs manageable and allow time for building the systems and the capacity necessary to deliver programmes at scale.⁷

This chapter will focus on the crucial role social protection schemes can play in making sure children have access to nutritious food.

Opposite: Nana and her family were provided with cash transfers to help them through the food crisis that hit Niger in 2010. Families were later given two goats to breed and sell.

FAMILIES IN DEVELOPING COUNTRIES TEND TO SPEND BETWEEN 50% AND 80% OF THEIR INCOME ON FOOD. THE AVERAGE UK FAMILY SPENDS 8%.

WHAT IS SOCIAL PROTECTION?

Social protection programmes and policies aim to make poor people less vulnerable and protect them from extreme deprivation.⁸ Examples of social protection programmes include cash transfers – when regular cash payments are delivered directly to families, usually by governments – and short-term emergency or seasonal safety nets, such as food aid, which are provided for a limited period of time.

Social protection and safety nets can help reduce threats to families' incomes and to their food supply in the short-term, and enable them to invest in assets, such as livestock or milling machines, that will help them become more productive in the long-term.⁹ Social protection interventions are becoming increasingly relevant in the current climate of economic uncertainty, food price volatility and increasing extreme weather events.

THE GLOBAL FOOD PRICE CRISIS

Global food prices reached record levels in 2011. Save the Children estimated that the price spike may put an additional 400,000 children's lives at risk.¹⁰ The combination of volatility and high prices is likely to continue or even increase.¹¹ Price increases on the international commodity markets are often reflected in increases in local markets in poor countries. When the global price of wheat rose in the second half of 2010 the price of wheat increased by 54% in Kyrgyzstan, 45% in Bangladesh, 31% in Sri Lanka, 16% in Sudan and 16% in Pakistan.¹²

Families in developing countries tend to spend between 50% and 80% of their income on food¹³ (compared with the average UK family, which spends 8%¹⁴) and so are forced to make difficult choices about where to cut back when the cost of food increases. They may be forced to reduce spending on healthcare or sell assets that could earn them money in the future, such as livestock or tools, to cover their short-term basic needs. Children feel the impact when families are forced to choose food over school fees or, in desperate circumstances, to send their children out to work.¹⁵

Families also cope with rising food prices by eating less, cutting how many meals they have per day and reducing the variety of foods, which has an impact on the nutritional value of meals. Studies show that women tend to cut back first, eating last; then, as the crisis deepens, other adults in the household cut back, and eventually children follow.¹⁶



A SAFETY NET FOR FAMILIES IN ETHIOPIA

In Ethiopia, the government's safety net programme provides food rations to Mujahid, his wife, Zahar, and their son (pictured here). In return Mujahid does five days work a month, doing jobs like repairing schools and health facilities, and constructing public water facilities.

"Before the safety net programme was introduced, if a drought came, we had to sell all of our animals," says Mujahid. "When you have no food you do whatever you can to feed your family. We'd sell all of our cattle or our goats. There would be nothing left. There would be nothing to breed, and after that, nothing to milk or sell.

"Drought has affected us this year. The rivers have dried. Animals are dying in other places. The programme has meant that we didn't have to sell our last animals – they'll give us milk all through this drought. And they'll breed again next year. We have enough food to survive without selling everything.

"We'll be well in this drought. We've enough to eat and sell."

IN INDIA, A SCHEME THAT GUARANTEES POOR HOUSEHOLDS 100 DAYS OF PAID EMPLOYMENT INCREASED FOOD SPENDING BY 40% ON AVERAGE.

EVIDENCE OF THE IMPACT OF SOCIAL PROTECTION

Evidence shows that social protection programmes increase food expenditure and increase dietary diversity. A study of the impact of the Mahatma Gandhi National Rural Employment Guarantee Act in India, which guarantees poor households 100 days of paid employment, found the scheme increased food spending by 40% on average, and that the effect is strongest for the poorest households who participated in the scheme the longest.¹⁷ Similarly, reviews of several well-established cash transfer programmes in Latin America found that cash transfers led to more diverse diets¹⁸ and beneficiaries ate more fruits, vegetables and meat as a result of the programmes.¹⁹

Several studies also show an impact on stunting;²⁰ some even show that the reduction of stunting from social protection could be measured in an increase in the average height of a child involved in the programme. A cash-for-work programme in Bangladesh after the 2007 floods showed significant gains in height and weight of young children.²¹ A successful social protection programme in Mexico reduced the rate of stunting by almost 10% and led to a 16% increase in the mean growth rate of children on the programme per year, which meant an extra 1 cm in height for the 6–36-month-old beneficiaries.²² In one study, seven out of ten cash transfer programmes showed positive and sizeable impacts on stunting.²³ A study of cash transfer programme in Nicaragua concluded that the greater levels of cognition observed among beneficiary children were at least partly explained by families spending the money received on more nutritious food.²⁴

LINKING SOCIAL PROTECTION TO NUTRITION

Specific steps can be taken during the design of policies and programmes to maximise their impact on nutrition. Social protection must reach young children and pregnant or breastfeeding mothers. There is particular value in targeting adolescent girls who are vulnerable to anaemia and can benefit from improved nutrition before their first pregnancy.²⁵ Since social protection programmes are diverse and their design is so critical to their impact on nutrition (see Table 5 for key aspects of design relevant for impact on nutrition), we will be conducting further research and identifying those elements that lead to strong nutrition outcomes.

Programmes that measure results by age show larger impacts for younger children.²⁶ A study of a Mexican cash transfer programme found that children who started the programmes 18 months earlier before the age of three years showed improved growth of about 1.5 cm.²⁷

The delivery of social protection can be linked to other nutrition and health programmes, such as nutrition education or breastfeeding groups, to enhance their impact on nutrition. A Mexican cash transfer programme that was linked to the

A SUCCESSFUL SOCIAL PROTECTION PROGRAMME IN MEXICO REDUCED THE RATE OF STUNTING BY ALMOST 10%

TABLE 5 SOCIAL PROTECTION SCHEMES AROUND THE WORLD

Country	Social protection programme	Key design characteristics relevant for impact on nutrition	Nutrition outcomes
Bangladesh	<p>There are around 30 public safety net programmes designed to protect the poor and vulnerable from shocks in Bangladesh.²⁸ Examples include:</p> <ol style="list-style-type: none"> 1. Female Secondary Schools Assistance Programme – payments and stipends to all girls who stay in secondary education²⁹ 2. Vulnerable Group Development (VGD) – provides long-term activities in areas such as risk management for natural disasters, HIV, maternal and child health and livelihood skills for the poorest rural women. 3. Challenging the Frontiers of poverty reduction programme/Targeting the Ultra Poor – provides a comprehensive assistance package to increase income opportunities while reducing vulnerability and risk 4. Chars Livelihood Programme – aims to reduce poverty on riverine islands in north-west Bangladesh 	<p>Many of the programmes in Bangladesh target vulnerable groups and aim to reduce poverty and improve nutrition.</p> <p>The programmes include a combination of cash and food transfers. Transfer size varies by programme.³⁰</p> <p>Strong links have been established between transfers and complementary services.³¹ Many of the programmes, such as the VGD, offer training and awareness-raising including in nutrition.³²</p>	<p>An assessment of various programmes found that children aged 6–60 months in households benefiting from the programmes have better nutritional impacts (although not statistically significant).</p> <p>In the Challenging the Frontiers of Poverty programme, 39% of boys and 34% of girls gained weight above the average.³³ Overall, malnourishment was reduced from 97% to 27% after just two years of programme participation.³⁴</p> <p>Earlier recruits into the Chars livelihood cash and asset transfer programme were on average less stunted and underweight than later recruits.³⁵</p>
South Africa	<p>The Child Support Grant is a means-tested cash grant to help poor households and care-givers provide for children aged 0–17.³⁶</p>	<p>The programme covers 70–80% of children in the poorest households.</p> <p>Paid to primary care-giver</p> <p>Size of transfer: \$34.50³⁷</p>	<p>An evaluation in 2007 found significant gains in height-for-age, particularly for children who benefited from the programme for at least two-thirds of their first three years, who are predicted to be 3.5cm taller as adults.</p>
Mexico	<p><i>Oportunidades</i> is a conditional cash transfer designed to improve the health and nutritional status of families living in extreme poverty and includes nutritional supplements for young children, and pregnant and breastfeeding women.</p>	<p>The programme provides a large cash transfer (equivalent to over 20% of the figure for the national poverty line).³⁸</p>	<p>Evaluation studies of Mexico's <i>Oportunidades</i> find that, two years after the start of the programmes, children exposed to the programme gained one centimetre in height for age compared with a control group. The gain was 0.65cm six years after the start of the programme.</p>



PHOTO: JENN WARRENSAVE THE CHILDREN

Alek with her daughter, Ayel, aged three, Northern Bahr el Ghazal State, South Sudan.

Alek used to rely on gathering leaves and wild fruits for food. Ayiel was very weak and malnourished. Since Alek started working on a cash-for-work project, supported by Save the Children, she's been able to buy food and medicine for her children. Ayel is no longer malnourished. She'll be ready to join her two brothers at school next year.

distribution of nutritional supplements was shown to increase mean growth per year by about a sixth and to lower the probability of stunting.³⁹

Alternatively, social protection can be delivered only on the condition that participants also access another service, such as visiting a clinic, or receive another intervention, such as nutritional supplements, that will also contribute to improvements. However, conditional transfers have shown mixed results.⁴⁰ Conditionality adds extra cost to the delivery of programmes and depends on the supply of other services being strong and reliable. Conditions can be an additional time burden to the beneficiaries, who are often female and whose time is often already significantly constrained by work and caring for children.⁴¹ Nevertheless, there is a perception that conditionality may be the price needed to win wide political support for social protection policies.

Improvements to nutrition can also be achieved by simply ‘labelling’ the transfer as a nutrition transfer. Beneficiaries of Save the Children’s cash transfer programme in Sri Lanka to provide livelihood support to the poorest tsunami-affected households were told that transfers were intended to help improve the nutrition and health of their children. The increase in household income through unconditional cash had a positive impact on the nutrition of the children of poor families when compared with a matched control group.⁴²

TARGETING

Deciding on the best method for selecting which beneficiaries will receive the benefits of a social protection scheme can be complicated. Successful targeting depends on a number of factors, including who is most in need, and the ability of national governments to effectively identify them⁴³ and judge the scale of the need (see box on the Hunger Safety Net Programme in Kenya on page 46, for example). The impact of social protection on poor and vulnerable households, particularly in increasing access to social services and nutrition, depends critically on who is targeted and how.

Different targeting methods all have pros and cons, and therefore the decision on who to target and how needs to be informed by national dialogue and country-level analysis into vulnerabilities and cost effectiveness.⁴⁴ For example, weak data systems in developing countries often mean that identifying households based on levels of poverty is not possible or cost effective. Some developing countries have therefore used a combination of targeting methods, based on demographic characteristics – such as age or proportion of household members unable to work and therefore dependent on the livelihoods of other members – or ‘proxies’ for poverty – such as type of housing and number of productive assets – to target scarce resources at the most vulnerable. By progressively rolling out programmes, geographically or by age, countries can build administrative and financial capacity, while reaching more vulnerable groups.

To maximise improvements to nutrition, the use of age criteria may be particularly effective. A social protection package should include, as a minimum, transfers to children

under two, and to pregnant and breastfeeding mothers. Transfers to mothers should continue for at least six months after birth in order to support breastfeeding.

National governments in developing countries, supported by donors in richer countries, where the proportion of households in need of social protection is very high should consider universal transfers.⁴⁵ A universal transfer would see benefits reach everyone in the community – or even in the whole country – would win broader political support, and would save the government time and resources in a complicated targeting process.

Finally, the amount of the cash transfer or benefit must be designed with a large enough transfer size or sufficient value of vouchers to have an impact on nutrition. It must take into account the cost of a nutritious diet and be flexible enough to respond to fluctuating prices by, for example, being linked to an index of regularly monitored local prices. Evidence suggests that, for a transfer to have an impact on children's nutritional status, it should be equivalent to approximately 30% of current household spending.⁴⁶ For example, in Mexico and Colombia, where transfer size has been greater than 20%, a significant impact on stunting has been shown. Social cash transfer programmes have been found to be very effective in emergency situations and, where already in place, can be scaled up in a disaster or following shocks to provide an effective safety net for those that need it.

THE HUNGER SAFETY NET PROGRAMME IN KENYA

The Hunger Safety Net Programme (HSNP) in Kenya is a DFID-funded unconditional cash transfer programme targeting people who are chronically food insecure in north-east Kenya. The goal of the HSNP is to reduce extreme poverty and food insecurity, as well as to promote the retention and accumulation of assets.

The programme has been designed to explore how to successfully target the poorest and most vulnerable groups, and to contribute to the evidence base on the impact of cash transfer programmes. In Mandera district, Save the Children is engaged in targeting.

Under the HSNP, more than 60,000 households are receiving a transfer every two months through a system of electronic payments. The HSNP is part of a government-led national social protection system that includes transfers for orphans and vulnerable children, pensions for the elderly, and an urban food subsidy programme.

WOMEN AND SOCIAL PROTECTION

There is evidence to show that cash transfers also have a positive impact on the status of women in the community.⁴⁷ Analysis by Save the Children has shown that the greater gender equality there is in a country, the lower the rate of under-five mortality, suggesting that benefits of women's empowerment extend to their children.⁴⁸ The extent to which women's control over household resources or decision-making is affected by social protection policies varies. Social protection programmes seeking to improve the nutrition of children should be delivered in ways that increase the decision-making power of women and recognise their role in caring for children and in ensuring a nutritious diet for the family.⁴⁹ A recent study of the impact of a Mexican social protection programme on household budgets concluded that the proportion of the participating households' budget that was spent on food either remained the same or increased.⁵⁰ This was contrary to the expectation that it would fall as a proportion of an increased budget; this was attributed to the fact that the cash was put directly into the hands of women.

CONCLUSION

Children's nutrition is jeopardised by economic uncertainty, chronic poverty and fluctuating food prices. Social protection has shown increasing relevance throughout the developing world and can play an important role in reducing poverty, in realising children's right to nutritious food, and in building families' resilience to economic shocks.

Social protection can be a cost-effective approach to growth and productivity that has already shown significant returns. With sustained momentum, it could make an even more significant impact on reducing stunting and improving economic prosperity.

RECOMMENDATIONS

- **Implement social protection schemes designed to improve nutrition:** All governments in developing countries should consider implementing a social protection scheme that is based on its own country context and that specifically includes education about nutrition. In order to maximise the nutritional impact of social protection, governments considering implementing such policies must ensure that they are designed to reach children under two, adolescent girls, pregnant women and breastfeeding mothers.
- **Link transfers to the cost of a nutritious diet:** The amount transferred should be in line with the cost of a nutritious diet and be flexible enough to respond to fluctuating food prices. Social protection policies and programmes should enhance and complement existing nutrition policies.



4 HARNESSING THE POTENTIAL OF AGRICULTURE TO TACKLE MALNUTRITION

“Nutrition should be the main driver of agriculture. What else is agriculture for?”

Lawrence Haddad, Director, Institute for Development Studies¹

The global food system – the process by which food is produced, distributed and consumed² – is under pressure from a growing population and is failing to meet the hunger and nutritional needs of many people in the world. One person in seven goes to bed hungry every night.³ Around 2 billion people do not get the micronutrients they need.⁴

Making the food system work to improve nutrition means more than simply increasing production – more food does not automatically mean better nutrition. The real challenge is to improve the quality, availability, utilisation, and affordability of and access to food.

However, the potential of agriculture initiatives to translate into better nutrition outcomes has been largely assumed and often overlooked. This chapter outlines how improvements in nutrition can be achieved through agriculture by considering a number of factors:

- investments in smallholder farmers
- assessing the functioning of local markets and the availability of affordable nutritious food
- focusing on women farmers
- boosting nutrition education
- investing in better research
- considering the impact of agriculture on health.

This chapter examines the socio-economic barriers to improving nutrition through local food production, such as poverty and inequality. It also looks at global challenges to nutritious food production, including changing demands of an expanding global population and climate change.⁵

ONE PERSON IN SEVEN GOES TO BED HUNGRY EVERY NIGHT.

Opposite: Baraka tends crops. Niger.

AGRICULTURE'S POTENTIAL TO IMPROVE NUTRITION

The overall aim of improving nutrition through agriculture is to get children and their families to consume the nutrients they need through eating a healthy, diverse, well-balanced diet. Agriculture can benefit children's nutrition in two ways:

1. through the type of food that families grow and raise to eat themselves
2. through the crops and livestock farmers grow and raise to sell in the marketplace in order to make an income with which to buy food.⁶

Benefits to children's nutrition can be achieved by encouraging households to grow more nutritious crops, including fruits and vegetables, or to rear animals for meat, eggs or milk, in addition to the staple crops they tend to rely on. Increased production also means they can sell more, generate more income and afford to pay for foods that will make up a more nutritious and diverse diet.

Poor rural communities bear the burden of the failing food system. The majority of the world's malnourished people live in rural areas and the majority of malnourished children's families rely on agriculture for at least some of their food sources and income. Families living in remote rural communities face huge challenges in getting enough nutrients, because of poverty, poor infrastructure, and a lack of access to markets and health services. Rural families that are also smallholder farmers face similar challenges in getting their crops to market.

The potential of agriculture to improve the nutrition of children and their families is not yet fully explored, fulfilled or prioritised. Studies show that when improved nutrition is made an explicit objective of agricultural programmes they can lead to increases in the quantity, nutritional quality and affordability of the food families eat. For example, home gardening⁷ projects have increased the amount of fruits and vegetables eaten as well as the amount of income generated,⁸ and fishing projects increased the number of people eating fish. Livestock can improve nutrition by providing meat or dairy products for families to eat, or as a way of generating money through the sale of milk.⁹ These examples may seem obvious, but all too often the objective of agricultural improvement schemes has been to increase the yield of a staple crop (quantity) or high-priced horticultural product rather than to produce more diverse nutritious foods (quality); and the cost of a nutritious diet (affordability) is overlooked. More research is needed to provide evidence on the impact of agricultural interventions on rates of malnutrition, on models of best practice and on strategies for implementing programmes at scale.

When agricultural interventions fail to take nutrition into account, not only is an opportunity lost to get the maximal return on investment but, surprisingly, these interventions can actually have a negative impact on nutrition. To address this, USAID is piloting a "do no harm" tool (see page 57).



PHOTO: HARRIET LOGAN/SAVE THE CHILDREN

Ouma weeds the crops she has just planted and hopes there will be enough rain for a good harvest. Niger.

HALF THE WORLD'S UNDERNOURISHED PEOPLE CAN BE FOUND ON SMALL FARMS.

Projects that support farmers to diversify or increase their production can only simultaneously improve nutrition results if policy-makers recognise the myriad of factors influencing the diets of children and their families. Context-specific strategies are needed that take into consideration local variations in what families like to eat, how they share food, who produces, buys and prepares food, and how much they know about nutrition.

Agricultural programmes must also be improved to increase access to the vital inputs poor people rely on to participate in agriculture – particularly land, tools, fertilisers and seeds, credit, agricultural services, markets and water. This chapter will discuss some of the barriers to participation that poor people – particularly women – face, and will highlight the needs of agricultural labourers who purchase rather than grow most of their food.

IMPROVING NUTRITION THROUGH AGRICULTURE: KEY AREAS TO CONSIDER

INVESTING IN SMALL FARMERS

Half the world's undernourished people – and three-quarters of Africa's malnourished children – can be found on small farms.¹⁰ Policy-makers should ensure poor, rural farmers such as smallholders, sharecroppers and labourers will benefit from investments in agriculture. Any improvements in the productivity of this group will depend on the quality of the land they own – if they do indeed own any land – and their access to inputs, such as fertilisers or tools. Poorer farmers, particularly women (see more below), tend to have small plots of often poor-quality soil with little access to water. Therefore, farming systems recommended for promotion should meet household nutritional needs and be culturally-appropriate, paying particular attention to environmental and agronomic conditions and needs.

ACCESSIBILITY OF LOCAL MARKETS

A family's decision on whether to sell or consume the food they grow is influenced by market demand for their products as well as the availability of market information. Any efforts to improve nutrition through agriculture should assess how local markets are functioning and how different groups of producers are able to make use of them. To be truly accessible, a market must be within reach geographically with appropriate transportation, and also available for use by smallholder farmers and particularly female farmers. Factors that limit women's access to markets can include local beliefs about women's place being confined to the home, their access to transportation and men's role in controlling income and vital market information.

IN AFRICA, WOMEN CARRY OUT 90% OF THE WORK OF PROCESSING FOOD CROPS AND PROVIDING HOUSEHOLD WATER AND WOOD.

Where local markets are functioning well and are accessible, smallholder farmers may do better by selling their produce rather than eating it. In these instances, smallholder farmers should be supported to maximise their income. Education about nutrition should be prioritised to encourage farmers to spend their increased income on more nutritious food.¹¹

AVAILABILITY OF AFFORDABLE NUTRITIOUS FOOD

Save the Children's research showed that poor people tend to purchase most of their food using income gained from working for others, rather than consuming food they have grown themselves. The reasons for this are lack of land, lack of access to agricultural inputs (credit, fertilisers, etc) and the absence of opportunities for self-employment.¹² As discussed in chapter 3, the often high cost of a locally available nutritious diet is therefore a huge barrier to nutrition. Addressing this must be prioritised for interventions to benefit the poorest. Social protection plays an important role in assisting poor and particularly vulnerable groups to purchase more nutritious foods (see chapter 3).

SUPPORTING WOMEN FARMERS

In developing countries, women are primarily responsible for food-related activities. In Africa, women carry out 90% of the work of processing food crops and providing household water and wood, and 80% of the work of food storage and transport from farm to village.¹³ In Kenya, women provide approximately 75% of total agricultural labour.¹⁴

In south-east Asia, women provide up to 90% of the labour for rice cultivation. In Pakistan, rural women provide 50% percent of the labour to harvest wheat.¹⁵

While women provide the bulk of the labour, they have limited control over or access to key resources – including land. Land is an essential input fundamental to agricultural production. Women across developing countries are less likely to own or operate land or have access to rented land. For example, women represent less than 5% of all agricultural holders in the countries in north Africa and west Asia for which data are available. Furthermore, the size of the land women hold tends to be smaller and the quality poorer.¹⁶

Given their central role in food production, it is critical that any attempts to improve nutrition through agriculture include women, and must improve their access to key resources and inputs. Agricultural programmes must be designed to take into account the different roles men and women play in agriculture, the household and the community. Barriers for women farmers created by any gender inequalities (eg, access to land, credit, agriculture extension services, inputs, transportation) should be identified and overcome. For example, women receive only 5% of agriculture extension services worldwide.¹⁷

Putting income in the hands of women has been proven to yield beneficial results for child nutrition, health and education.¹⁸ Investment in women farmers that increases their income and decision-making power will therefore generate returns for the women themselves and their children, as well as for the wider community.

In addition to being producers of food, women are predominantly responsible for buying food, preparing meals and feeding children. These joint responsibilities mean women are key to unlocking better nutrition. Programmes must recognise the dual role that women play as food producers and food providers. Targeting women through a combination of nutrition education and agricultural support is an effective strategy for reducing malnutrition in the most vulnerable communities, with the impact most pronounced among the lowest income groups.¹⁹ These programmes should also target men, so both men and women know the importance of nutrition, especially for pregnant women and young children.

However, it is important not to overlook the impact that an increasing role in agriculture can have on women's other roles as care-givers.²⁰ Strategies should be identified that will increase opportunities for women to participate in agriculture and that reduce burdens on their time. Time-saving investments – such as processing equipment, access to water, or transportation – can be essential to enable women to increase their incomes and serve as care-givers. Supporting men to increase their participation in care-giving can also ease time pressures on women, and transform unequal gender relations.

NUTRITION EDUCATION

As discussed in chapter 2 and defined in the Lancet package, promoting the best foods and best ways to feed children between the ages of 6 to 24 months is vital.²¹ In many cases nutrition education should be provided at the same time as agriculture projects, in order to maximise the benefits. For example, information should be shared about the value of certain garden fruits and vegetables in addressing vitamin A deficiency and how best to prepare food so that it is safe and nutritious – for example, by adding green leaves to family dhal (lentils).²²

This education can be provided by agriculture extension officers (who provide advice and services to farmers), community health workers, public awareness campaigns and nutrition education in schools. In developed countries, children are often taught about the value of good nutrition both through health services and in schools, where subjects like food technology are included on national curricula.²³

GROW YOUR OWN: TACKLING POOR NUTRITION IN BANGLADESH

One programme that has been highly successful in improving child nutrition is *Jibon o Jibika* (Life and Livelihoods) in Bangladesh. Over five years, the programme enrolled more than 400,000 children under two years of age. During these five years, in the three districts where the programme operated, rates of malnutrition among young children came down against stunting and wasting indicators, and exclusive breastfeeding rates rose dramatically.

The programme consisted of four components:

- **setting up and supporting homestead gardens**, where local communities grow different varieties of micronutrient-rich vegetables and fruits throughout the year.
- **improving access to key services** – basic healthcare, safe water, and sanitation facilities, and ensuring mothers are given nutritional advice.
- **giving women a route to market**, by setting up a system where a local farmer purchases the surplus vegetables produced by women in their home gardens and then sells them on at market. This enabled women to generate income despite limited mobility and lack of access to markets.
- **supporting women's home food production**, by enlisting a local farmer to provide information and tuition on year-round gardening techniques, new nutrient-rich vegetable varieties, rearing poultry and preserving seeds.

Good grows

The final evaluation found that stunting levels among children under two years of age were reduced in villages where homestead gardens had been established, as opposed to where they had not. It suggests that increasing the amount of food households produce contributed to reductions in chronic malnutrition.

Combined power

However, a greater improvement in nutrition was seen when homestead gardens were implemented alongside the second component of the programme – improved access to maternal and child health and nutrition services, and to clean water and sanitation programmes.

The evaluation also found that the income women earned from selling surplus vegetables they had grown was used to pay for children's education and other household needs.

Women also reported this income gave them more status in their household.

The USAID-funded *Jibon o Jibika* programme (which ran from 2004 until 2009) was led by Save the Children, working in partnership with the Helen Keller International, the NGO forum and 14 local non-government agencies.

COMPLEMENTING AGRICULTURAL INTERVENTIONS WITH NUTRITION INTERVENTIONS

Agricultural interventions on their own are not enough. To be really effective in improving child nutrition, they need to be complemented by other proven programmes. These would include programmes that focus on healthcare, on care-giving practices, and on access to water, sanitation and hygiene facilities, so that high rates of infection can be overcome. Such a complementary, co-ordinated approach has demonstrated positive results. For example, the Save the Children Jibon-O-Jibika project in Bangladesh – which reduced malnutrition in three districts in Bangladesh – integrated nutrition, home gardens and health interventions (see page 55). Investments should be made in similar multi-sectoral approaches in order to identify best practice models that yield nutrition results.

RESEARCH ON THE VALUE OF NUTRITION-SENSITIVE AGRICULTURE

If nutrition is to become central to agriculture, identifying the approaches and structures that achieve results is key. Studies done to date to measure the impact of agricultural programmes, including biofortification (see chapter 2), on the prevalence of child malnutrition have been limited in their methodological design or in the collection of important indicators of success. Previous research has not measured the relative wealth or poverty of the participants, or what the outcome of the intervention has been on the diversity and nutritional content of participants' diet and on the height, weight and age of the children benefitting.²⁴

Uncovering agriculture's true potential to reach poor communities most at risk of malnutrition, to increase their incomes and to diversify their diets requires investment in broad-ranging, rigorous research. While more research in the area is underway,²⁵ there are serious gaps in evidence on what works. A recent review of agricultural interventions that aim to improve the nutritional status of children found that, of 307 studies on interventions that aim to have an impact, only 30 actually contain an impact assessment on nutrition relevant indicators. This shows that agricultural interventions fail to implement their nutrition components, or they are implemented but there is a failure to measure the indicators, or there is a failure to undertake an impact assessment. More rigorous, better designed impact studies, which collect children's height and weight data, are needed to help identify interventions that will improve a child's nutritional status.²⁶

CLIMATE CHANGE COULD LEAD TO 11–24 MILLION MORE MALNOURISHED CHILDREN IN 2050.

CONSIDERING THE IMPACT OF AGRICULTURE ON HEALTH

Agricultural work can affect nutrition and health in three ways:

1. manual work is physically demanding, can require higher calorie intakes, and can directly damage health
2. agricultural work exposes individuals to harmful germs, such as those found in water-borne diseases or that come from animal sources
3. where agriculture production involves the use of chemical pesticides, exposure to these can be a threat to health.

In many regions of the world the harmful impact of agricultural work on health has contributed to a downward spiral of low agricultural productivity, low income, poverty, and even worse nutrition and health.²⁷ Agricultural programmes that are seeking to improve nutrition must take account of the impact of agricultural activity on the health of farmers and labourers, which can affect nutrition, in order to ensure that these programmes do not inadvertently cause harm.

USAID's new 'do no harm' tool is designed to ensure that agriculture-related programming does not have a negative impact on the nutritional status of communities. While the tool does not ensure a positive result for nutrition, it is a first step in ensuring that programmes that increase food production do not cause harm. "The tool would be a way for organisations designing or reviewing agricultural programmes to mitigate any risks or potential negative effects on nutrition – in other words, a 'do no harm' approach," said Michael Zeilinger, head of the nutrition division with USAID's office of health, infectious disease and nutrition.

THE GLOBAL FOOD SYSTEM UNDER THREAT

Global factors that influence the underlying demographic, geographic and economic conditions in which local agriculture takes place are putting the food system under threat. Climate change is already threatening the food security and livelihoods of the world's most vulnerable people. The areas currently suffering worst from food insecurity are expected to be hit particularly hard by negative effects of climate change in the future, which will multiply the risk of hunger.²⁸

In a vicious cycle, the global food system is both contributing to and under threat from climate change. Increasing demand for meat and dairy produce, and food supply-chain activities, such as transport and refrigeration, are a major source of greenhouse gas emissions. Associated changes in climate – such as extreme weather events, including high temperatures, droughts and floods – are already more frequent and severe, and will have an adverse overall effect on agricultural production.²⁹ Estimates predict that climate change could lead to an increase in the number of malnourished children of 10–21%, which means 11–24 million more malnourished children, in 2050.³⁰

2 BILLION SMALLHOLDER FARMERS RELY ON LAND FOR THEIR LIVELIHOODS. MANY ARE POOR, AND VULNERABLE TO MALNUTRITION.

A global commission – featuring experts on agriculture, nutrition, climate and economics – recently recommended: “Investment, innovation and deliberate efforts to empower the world’s most vulnerable populations will be required to construct a global food system that adapts to climate change and ensures food security while minimising greenhouse gas emissions and sustaining our natural resource base.”³¹

A further barrier to food and nutrition security in poorer countries is the growing acquisition of large amounts of land by governments, corporations and others – sometimes known as land grabs. This can result in small-scale farmers being displaced, and in land being converted from food production to other purposes, such as biofuels or mining. It is estimated that 2 billion smallholder farmers rely on land for their livelihoods. Many of them are poor and they and their families are extremely vulnerable to malnutrition. The spike in food prices, a growing interest in land as a global trading asset and an increased demand for food, feed and biofuels, as well as for minerals and timber, is driving large-scale international investments in land. Estimates suggest that between 50 and 80 million hectares of land, mostly in low-income countries, have been acquired as investments; roughly two-thirds are in sub-Saharan Africa.³²

A recent UN report found little evidence that these international investments were improving agricultural productivity and rural livelihoods, and concluded that “large scale investment is damaging the food security, incomes, livelihoods and environment for local people.”³³ The report also found that families and communities living and relying on land that has been acquired in this way were at risk. The rights of women, minority ethnic communities, indigenous peoples and social groups that relied on the grazing, woodlands or wetlands were found to be particularly insecure.³⁴

CONCLUSION

The opportunity to enhance agriculture’s potential to deliver nutritious food is too often wasted. The strategies for integrating health, nutrition and agriculture are gaining momentum³⁵ but more must be done at the global and national levels. Donors and governments must prioritise nutrition to alleviate poverty and drive growth. In order to improve nutrition, agricultural interventions must be combined with other activities that are shown to improve nutrition, including the direct interventions.

The global barriers to food production are an ongoing threat. The international community has a responsibility to recognise and address the threats of climate change and of the increasing use of land for purposes other than growing food. Inclusive growth and a well functioning food system rely on nutrition. As Per Pinstrup-Andersen, author of *The African Food System and its Interaction with Human Health and Nutrition*, puts it, “Human health and nutrition are both the foundation of a strong food system and the expected outcome from such a system.”³⁶

RECOMMENDATIONS

- **Ensure nutrition is an explicit objective of agricultural programmes:** National governments developing agricultural policies must ensure that nutrition is an explicit objective of agricultural programmes. These programmes must support small-scale farmers, who provide for families most vulnerable to malnutrition, by helping them with the vital resources and knowledge they require and ensuring agriculture nutrition interventions are suited to the land they own.
- **Address local markets:** Policies should be designed with the local markets in mind and seek to improve accessibility for small-scale farmers to the markets for producers, and availability and affordability of nutritious foods.
- **Support women farmers:** Donors and governments must recognise the key role of women as food producers and providers and ensure that they have equal access to vital resources, knowledge and income. The wider community should understand the value of producing and preparing nutritious food and the value in using the income they have generated to purchase the right kinds of food. Critical to success is that programmes are combined with other programmes, that have a proven impact on nutrition outcomes.
- **Support nutrition-friendly agriculture:** Donors must support national governments and civil society to increase the potential for farmers and communities to improve nutrition through agriculture.
- **Invest in research on harnessing agriculture to tackle malnutrition:** Donors, civil society and national governments all have a role to play in developing and improving the evidence base on how best to integrate nutrition and agriculture and improve child nutrition.
- **Identify and address the threats to nutrition from climate change and non-food land use:** The global community, including the G8, the G20 and international nutrition governance structures, must identify and address the potential impact of climate change and increasing non-food land use on hunger and malnutrition, and must ensure that global and national approaches to the food system integrate nutrition.



PHOTO: RACHEL PALMER/SAVE THE CHILDREN

5 GALVANISING POLITICAL COMMITMENT

The economic argument for tackling stunting is clear. Effective solutions to improve nutrition are proven, available and affordable. Why, then, has more not already been done to address the global burden of malnutrition and its resulting disease and death? Why has progress in the last 20 years averaged a meagre reduction of 0.65 percentage points a year?¹

The previous chapters have made the case for universal scaling-up of direct nutrition interventions; social protection to enable families to afford better food; and the inclusion of nutrition in food production policies and practices so more highly-nutritious food is available.

What the world needs now is action. Save the Children is calling on global leaders to recognise the key role of good nutrition in saving children's lives and in giving them a fair chance in life. The responsibility for action rests on the shoulders of three different – but interconnected – groups of world leaders.

First, the countries with high numbers of malnourished and stunted children must be committed to improving nutrition. It is possible to significantly reduce the percentage of under-fives who are malnourished, as Brazil, Bangladesh and Ghana, for example, have shown. Other countries with large populations of children under five, such as Nigeria and India, should take inspiration from these success stories in striving for similar progress. Nigeria, for example, has so far failed to address the nutrition crisis for the poorest. And although India has various social protection programmes in place, they are not focused on improving nutrition for infants and children and are not reaching a number of the most excluded and marginalised communities.

Second, the global institutions that have a mandate to tackle hunger lack a coherent strategy to improve nutrition. The lives of millions of children depend on the leaders of these agencies making the system work for positive nutrition outcomes.

Third, for far too long rich country governments did not give nutrition the support it deserved. There has been some improvement in recent years, particularly through the Scaling Up Nutrition movement (see page 66), which shows that political momentum is growing, but nutrition is still poorly understood, often equated solely with food, and poorly resourced.

This chapter outlines the current response to the nutrition crisis at the national, institutional and international levels. It points the way forward for world leaders in each of the three groups, explaining how political commitment should be translated into concrete action.

ACTION AT THE NATIONAL LEVEL

Ultimately, the biggest success factor in improving nutrition for mothers and children is the political commitment within a country itself. As this report has shown, investing in nutrition is in countries' economic interests.

In addition, falling levels of chronic malnutrition send a strong signal to the international community that the country is stable and governed well, which can attract further external supporters and donors. Conversely, a report by the Institute for Development Studies showed that static or increasing levels of stunting in a country experiencing economic growth are evidence of bad governance.²

High levels of stunting are sometimes simply seen as one of the background conditions in a country. Challenging this assumption requires the national government to decide to prioritise nutrition at all levels. Each country needs to develop a nutrition strategy that suits its own needs and context, and to place responsibility for delivering it at the highest level. Given that responsibility for nutrition does not tend to sit with one ministry, it is important to make sure that responsibility is shared between different ministries, such as the ministry of health and the ministry of agriculture, but is not diluted or dispersed. Clear central co-ordination and accountability are vital. One option is to place the leadership of nutrition at the heart of government in the president's office. This strategy was adopted in Brazil, which has managed to significantly reduce the prevalence of stunting (see opposite page).

Health workers and nutrition experts will be central to the success of the nutrition plan. Of the 20 countries that are home to 80% of the world's stunted children, half of them said they did not have enough trained nutrition staff.³ Doctors, nurses, midwives and frontline community health workers will be vital in delivering many of the direct interventions needed to improve nutrition. Governments in countries with high rates of malnutrition therefore need to consider how to fill the health worker gap, as a key part of tackling nutrition problem.⁴

Finally, the government must look at any of their other policies that may impact on nutrition, such as trade tariffs or business taxes, and ensure that they do not conflict. For example, some governments in Africa have maintained tariffs that inflate food prices during the drought season, while failing to develop regional and national food reserves, thus exacerbating the food crisis.⁵

FOLLOWING THE INTRODUCTION OF ZERO HUNGER THE POVERTY RATE HAS FALLEN AT UNPRECEDENTED RATES.

ZERO HUNGER IN BRAZIL

The actions of the Brazilian government show how strong political leadership can impact on child nutrition. When Luis Inácio Lula da Silva took office in 2003, one of his first acts was to set up the major Zero Hunger social programme.

Zero Hunger involves more than ten different ministries, each responsible for programmes relating to nutrition and food security. One of the most important strands of the strategy is *Bolsa Familia*, an innovative \$8bn conditional cash transfer scheme that now reaches more than 46 million people, a large part of the country's low-income population. Average monthly transfers are just \$12 per head⁶ but they have helped to reduce malnutrition in rural north-eastern Brazil, for example, from 16% in 1996 to under 5% today. Rural poverty in Brazil has fallen by two-thirds.⁷ And with a price-tag of 0.5% of Brazil's GDP, the country is demonstrating that social protection is affordable.⁸

Alongside *Bolsa Familia* are various other schemes, including the Food Procurement Program which purchases food from 80,000 small-scale family farmers, thus enabling them to increase their income; and the School Feeding Program, which serves nutritious meals to more than 36 million children. The National System for Food and Nutritional Security was created in 2006 to ensure effective coordination and collaboration between the various ministries and schemes involved in Zero Hunger.

Following the introduction of Zero Hunger, Brazil has met the Millennium Development Goal to halve extreme poverty and hunger early. The poverty rate has fallen at unprecedented rates, including a record 15% drop in one year to put the poverty rate at 19% in 2006.

The Brazilian leadership has encouraged civil participation in its nutrition programmes, funding the National Conference of Food and Nutritional Security (CNSAN), which unites the public sector and civil society to set guidelines for the policies of the president's nutrition advisory body. CNSAN has been important in advocating for many nutritional advances, including a 2006 law that institutionalised the right to food as a matter for state policy.

By engaging civil society, enshrining the right to food constitutionally, and building institutions and structures to ensure coordination across the breadth of the Zero Hunger strategy, Brazil has made impressive improvements in the nutrition of its population.

MANY DIFFERENT PLAYERS HAVE NUTRITION, FOOD AND HUNGER AS PART OF THEIR MANDATE, BUT THERE ISN'T ONE CLEAR LEADER.

THE GLOBAL NUTRITION SYSTEM

TOO MANY COOKS?

The global system of international institutions that work on tackling nutrition is complicated, with many different players who have nutrition, food and hunger as part of their mandate, but not one clear leader. Historically, nutrition has been everyone's business but nobody's responsibility.

In 2008, the Lancet described the international nutrition system as “fragmented and dysfunctional”.⁹ It identified the following list of organisations “working to reduce the global burden of undernutrition”:

“at least 14 UN agencies, five international and regional development banks, five major regional cooperation organisations, more than 20 aid agencies, at least five major charitable foundations and the 15 or so implementing agencies created by them, more than 30 international NGOs, at least 35 research centers, universities, and collaborative members of the Consultative Group on International Agricultural Research (CGIAR), 12 major nutrition companies, and several hundred academic journals.”¹⁰

The institutional bodies that hold the key to unlocking nutrition are the four large agencies at the UN – the Food and Agriculture Organization (FAO), UNICEF, the World Health Organization (WHO) and the World Food Programme (WFP), and two UN committees – the Standing Committee on Nutrition (SCN), and the Committee for World Food Security (CFS) (see opposite page).

This proliferation of institutions working on nutrition created a serious co-ordination problem, and has even led to a sense of false competition as mandates overlap and sometimes compete. Although the overarching aim of each of the six UN institutions and committees is to reduce malnutrition in some way, they differ in the type of malnutrition they focus on, the beneficiaries they target, their favoured solutions and the way they seek to influence the food system. Agencies working in the same country have been seen to act in isolation, competing for scarce resources or for the attention of government ministers. In order to make a significant improvement, all those working in the arena of food and nutrition must recognise that there are many different factors that can lead to a child being malnourished, and they must work together in a co-ordinated way.

In order for the various actors to work effectively together, a shared understanding of what nutrition means and how their organisations can add value in tackling the various drivers of malnutrition is required. Official definitions of food security – a broad term that incorporates availability, access, utilisation and stability of the food supply – include reference to nutrition, but the terms are often understood differently by different organisations. In reality, achieving food security does not necessarily lead to improved

THE EVOLUTION OF THE UNITED NATIONS NUTRITION SYSTEM

- 1945** The Food and Agriculture Organization was formed to focus on food security and on ensuring people have regular access to enough high-quality food. It is a knowledge network, with experts on agriculture, forestry, fisheries, livestock, nutrition and economics, that collects, analyses and disseminates data, and devises policies. FAO runs field projects throughout the world, mainly providing technical advice.
- 1946** UNICEF (the United Nations Children's Fund) was set up as a child rights organisation with a broad mandate that includes education, child protection, health and hunger. UNICEF delivers direct nutrition interventions, such as vitamin A supplements, as part of its frontline child health work and has specific expertise on breastfeeding.
- 1948** The World Health Organization became the UN's authority for health and is responsible for leadership on public health, shaping the research agenda, setting standards, and monitoring health trends, including disease outbreaks. Its yearly assemblies are the principal forum for discussing nutrition issues.
- 1961** The World Food Programme was launched – a humanitarian agency focused on fighting hunger worldwide, particularly following emergencies like conflict or natural disaster.
- 1974** The Committee on World Food Security, an intergovernmental body hosted by FAO, was created as a forum for reviewing food security policy.
- 1977** The Standing Committee on Nutrition became a forum to improve the effectiveness and coordination of the UN response to nutrition.
- 2008** The High Level Task Force on the Global Food Security Crisis (HLTF) was created to co-ordinate the UN response to the food price rises. It has since become a permanent body and is currently led by the UN Secretary-General's special representative on food security and nutrition.
- 2008 also saw the establishment of the Renewed Efforts Against Child Hunger (REACH) process, which is an approach to programme-strengthening developed by the UN system. REACH is a coordinating mechanism for WFP, UNICEF, WHO, and FAO, and is supporting the scale up of nutrition activities in 13 countries.¹³
- 2009** The reform of the CFS was completed, and reform of the SCN launched.

nutrition, nor is it the only necessary precondition for adequate nutrition (which also requires a sanitary environment, adequate health services, and proper care and feeding practices to ensure a healthy life¹¹). Further, while some would argue that adequate nutrition is integral to the concept of food security, improved nutrition has only rarely been used to measure success in assessing food security responses.¹² The first steps are therefore to establish a common understanding between policy-makers, academics and practitioners of the concept of nutrition and food security, as well as of the role of infection and an individual's ability to absorb vital nutrients from this food. This should lead to a shared goal to improve both the quantity and quality of food.

SCALING UP NUTRITION

The most recent significant development in the global nutrition system has been the creation of the Scaling Up Nutrition (SUN) movement in September 2010, to galvanise efforts and provide co-ordination and leadership in the fragmented sector. It is already achieving considerable high level political support.

The initiative brings together more than 100 organisations from the UN, governments, civil society (including Save the Children) and the private sector, bringing in a much wider range of players to work on improving nutrition. It aims to put civil society organisations, and by extension the people they work with, at the centre of the nutrition debate and to give them a way to engage meaningfully in decision-making, particularly at the national level.

The SUN movement has called for better co-ordination between donors, and has encouraged them to support nutrition in a more meaningful way.¹⁴ The US government and Irish Aid have shown a commitment to tackling malnutrition and have been strong supporters of the launch of the 1,000 Days Partnership, which aims to increase attention to and investment in global nutrition during that critical period of a child's life. The UK government has been supportive, and other donors, such as Germany and Switzerland, are now beginning to show support.

Joining the movement

Since 2010, 22 countries¹⁵ have officially committed themselves to the Scaling Up Nutrition Movement. Countries that join commit to ensuring that programmes in all sectors of government are sensitive to nutrition, and to increasing coverage of specific interventions that improve nutrition during the 1,000-day period (from conception until a child's second birthday), such as support for exclusive breastfeeding, optimal complementary feeding practices and delivery of essential vitamins and minerals. Partners can contribute to national nutrition plans by building political energy, and putting financial and technical resources behind countries' priorities.

Opposite: Bangladesh: Aduri, aged three, was malnourished but is now healthy, after her family received support from Save the Children's family credit programme. Her father was able to start a small business, and has tripled the family income.



PHOTO: MADHURI DASSANE THE CHILDREN

THE ROLE OF CIVIL SOCIETY IN ADVANCING THE NUTRITION AGENDA

Civil society plays a number of important roles in contributing to national and human development, including engaging in service provision; global and domestic policy discussion and debate; advocacy and campaigning; and technical assistance and capacity building for critical skills. In addition, civil society organisations engage in operational research to increase the evidence base, and in piloting new approaches to tackling undernutrition.

Holding governments to account is a central role for civil society. Civil society organisations (CSOs) and other influential civil society actors, such as the media, can

CIVIL SOCIETY MOVEMENTS

Tanzania: In August 2011 the national level civil society Nutrition Partnership for Tanzania (PANITA) was launched in Dar es Salaam. Officiated by the Minister for Agriculture, Food and Cooperatives, the partnership received support from a wide spectrum of ministries (including East Africa Cooperation; Water and Irrigation; Livestock Development and Fisheries; Community Development Gender and Children; Industry, Trade and Marketing; Health and Social Welfare; and Education and Vocational Training) and robust participation from civil society and other stakeholders.

In less than one year PANITA has attracted more than 90 civil society members working across Tanzania on nutrition, with representatives working on agriculture, livestock development, water and sanitation, health, economic empowerment and social protection. PANITA will give civil society a strong voice in nutrition planning and policy processes. And it will be part of the larger partnership – involving government, development partners, local and international organisations and the private sector – seeking to scale up nutrition.

Uganda: The Uganda CSO Coalition on SUN (UCCOSUN), which was established in 2011, has grown from a meeting of four people to welcoming the membership of more than 50 civil society organisations. Rather than starting from scratch, the coalition builds on existing CSO initiatives on maternal and child nutrition. It contributed to the development of the Ugandan Nutrition Action Plan 2010–15 and has been working with the Speaker of Parliament and at least 15 MPs to lobby for legislation prioritising mother and child nutrition. The coalition has published a national commitment on nutrition and exhibited at the first Ugandan CSO Fair.

hold governments – both donor and recipient – accountable for keeping their promises, and advocate for the scale-up of programmes and the increase in human and financial resources that are essential to tackling development issues. They can enhance their impact by taking strong, collective and coordinated action, working in coalitions or establishing new partnerships when they do not exist. CSOs can also inspire popular collective action using campaigners, advocates and lobbyists at national, regional, and global levels to communicate the need for the highest priority to be placed on development issues.

The limited number of CSOs with a focus and expertise on nutrition and nutrition-related issues – such as food security, agriculture, health and women’s rights at national level – need better coordination. There is limited funding for advocacy and popular mobilisation within countries. As a result, national and local organisations lack the resources to influence government policies. There are relatively few organisations actively seeking to raise nutrition up the political agenda. The SUN movement promotes a more prominent role for civil society in both global and national responses to malnutrition, but strengthened global and national support for advocacy mobilisation and leadership is urgently required.

LEADERSHIP

Despite these latest developments, political commitment for nutrition is fragile. Nutrition needs a reinvigorated global governance structure with high-level leadership to ensure it is included in major political processes. Without a high-level leader who is ultimately responsible and without global targets that specifically measure stunting, any recent momentum is in danger of stagnating.

There is a clear contrast between the status of nutrition in the global development agenda and the recent impetus given to maternal and child health with the creation of the Every Woman, Every Child global strategy. This global strategy is led by the UN Secretary-General and supported by heads of state, the private sector, foundations and technical experts. It is directly linked to the Millennium Development Goals and has inspired high-profile ambitious political commitments after featuring prominently at the UN General Assembly in 2010 and 2011.

The SUN process has the potential to galvanise similar action and attention for nutrition, but to achieve this it will require similar high-level political support. There are promising signs. SUN is evolving into an effective partnership between participating countries and those aligning their support behind country scale-up plans.

The UN Secretary-General supports SUN and has asked that a Leadership Group be formed to improve coherence, provide strategic oversight, improve resource mobilisation and ensure collective accountability. The final decision on the future governance of SUN was due as this publication went to press. However, members of

NUTRITION LACKS A GLOBAL TARGET THAT CAN INSPIRE AND GUIDE THE ACTIONS OF ORGANISATIONS AND GOVERNMENTS.

the Leadership Group are expected to be high-level officials who are committed to equitable human development, and who will serve for two years in the first instance. They will be drawn from communities of development partners, including donors, civil society, business, and the UN system.

At the core of the Leadership Group will be members from SUN countries. Members of the Leadership Group will be responsible for ensuring that national authorities are supported to produce measurable outcomes and results.

The UN Secretary-General has said he wants to see nutrition integrated into the Every Women, Every Child strategy, which is a promising indication of high-level commitment. At the end of 2011, the UN Secretary-General had nominated Tony Lake, Executive Director of UNICEF, to act as the Chair of the Leadership Group (in a personal capacity). Save the Children welcomes the leadership and vision that Mr Lake will bring but also encourage the UN Secretary-General to retain personal oversight to ensure it has the political profile it deserves.

While SUN presents great opportunities, it is not without limitations. As a 'movement' rather than a permanent institution, its aims are to galvanise political will, coordinate aid for nutrition and enable existing structures to function better. Its success relies on the sum of its parts. It is important to focus on the improved coordination and accountability of existing permanent structures and key processes – such as the reform of the UN Standing Committee on Nutrition, and the future of the High-Level Task Force on the Global Food Security Crisis – and most importantly, the institutional accountability structures set up at a national level in countries burdened with malnutrition.

Finally, the CFS, which aims to be 'the most inclusive international and intergovernmental platform for all stakeholders to work together to ensure food security and nutrition for all', also holds one of our best opportunities for creating a coherent response to malnutrition.¹⁶ The CFS is making progress in improving coordination and coherence but it can be further improved through higher-level engagement from member states and the development of an accountability mechanism that translates CFS commitments and recommendations into national level action. This will enable the CFS to fully deliver on its mandate to ensure food security and nutrition for all, as well as to promote coherence amongst different international decision-making groups, such as the G20 and the World Health Assembly.

ESTABLISHING A STUNTING REDUCTION TARGET AND TRACKING ITS ACHIEVEMENT

As well as sufficient leadership, nutrition lacks a global target that can inspire and guide the actions of organisations and governments. The Millennium Development Goals do include a target to halve the proportion of people who suffer from hunger by 2015 (MDG 1), but the indicators track calorie intake and weight rather than height.

A global target for stunting would measure the rate of stunted children, thus tracking progress on this important measure of nutrition. It could be a unifying objective that gives all the international agencies and rich and poor countries something to work towards. As this report went to press, the World Health Organization made an initial proposal for a global target of a 40% reduction in childhood stunting by 2022 as part of its Maternal, Infant and Young Child Nutrition: Draft Comprehensive Implementation Plan. This is a step in the right direction and could see the target adopted by member states as a resolution at the World Health Assembly in 2012. This proposal needs not only to be examined by individual countries, but by relevant partner organisations within the SUN movement, including Save the Children, to ensure that it is sufficiently ambitious while remaining realistic. Relevant and appropriate national targets need to be made that are aligned with the global target, and mechanisms for accountability and feedback must be included.

EARLY SIGNS OF A GLOBAL PLAN FOR IMPROVING NUTRITION

The WHO has recently published its Maternal, Infant and Young Child Nutrition Implementation Plan, which was mandated by a resolution at the World Health Assembly in 2010 and drafted with great attention and care for the developments emerging from the SUN movement. The plan and its targets are a positive sign of a unified approach and commitment to tackling nutrition on a global scale. If member states pass a resolution to adopt this plan at the World Health Assembly in May 2012, it would signal high-level political endorsement for nutrition and the critical principles of donor alignment, country ownership, cross-ministerial coordination and accountability and multi-stakeholder engagement, which have emerged out of the SUN movement.

However, as an outcome of the World Health Assembly, there is a risk that the implementation plan will be viewed by national and international actors as limited to the health-related aspects of nutrition, at the expense of a broader response that includes social protection, nutrition education and agriculture. In this respect, the SUN movement offers great potential, not least in helping to ensure that the WHO Implementation Plan informs decisions and commitments made in other high-level political forums in 2012, most notably the G8 and G20 meetings and the CFS.

DONOR GOVERNMENTS

PROGRAMMES AND POLITICS

Governments of rich countries play a dual role in tackling nutrition. First, they tackle malnutrition on the ground through foreign assistance and grants. Second, they work on a political level in groups like the G8 and G20 and at the UN. As such, each donor has the ability to shape the agenda of these forums either through an influencing strategy or by providing funding. Whether acting alone, or as part of international forums, world leaders have a responsibility to bring about a reduction in stunting.

Private donors have a similar role to play. Foundations such as the Bill and Melinda Gates Foundation not only contribute significant resources, but can have a powerful voice in setting the global agenda.

THE FUNDING GAP

Leaders of rich countries need to provide more and better funding for nutrition to ensure the success of nutrition programmes on the ground. The amount of funding committed is generally an indicator of the level of political commitment.

The price tag to increase coverage of the Lancet 13 direct interventions is estimated to cost approximately \$10.3 to \$11.8 billion annually.¹⁷ However, the total cost of achieving change will also need to include the cost of funding social protection schemes and agriculture projects. These projects can be a challenge to quantify and cost because they are so broad. Nevertheless, their benefits often reach beyond nutrition. For example, a farming project that improves nutrition could have an impact on trade, agriculture, employment and health in a region. It is likely to benefit not just children and their parents, but also the community, local farmers, market traders and businesses.

There is a pressing need to quantify the cost of funding development that is sensitive to nutrition. The amount that is being spent on nutrition by international donors is estimated at \$300–\$400 million annually, but this is likely to be inaccurate because of the way money for nutrition is tracked. Studies have revealed a lack of transparency and consistency in reporting nutrition funding.¹⁸ Donors are required to report how much they have spent as aid, and what it was spent on, to a central database, but there is no uniform way to classify which projects come under the category of ‘basic nutrition’ spending. What is classed as nutrition spending might have a larger impact on health or, conversely, what is classed as health might have had a bigger impact on nutrition. Only about a third of basic nutrition spending goes towards one of the 13 essential nutrition interventions, while the rest goes on other projects, including school feeding and interventions that fall under the broad food security heading.¹⁹ More work is needed to accurately quantify how much is being spent and the funding gap.

BY THE END OF APRIL 2013, IT WILL ALREADY BE TOO LATE TO MAKE A DIFFERENCE TO THE LAST GENERATION OF CHILDREN WHO WILL REACH THEIR SECOND BIRTHDAY IN 2015.

GLOBAL FORUMS

Save the Children believes it is critical that nutrition is on the agenda when heads of state from the world's largest economies come together at the G8 and G20 summits in the next two years. In the last few years both the G20 and G8 have focused on the global economy and financial crises. Food security in general, and nutrition in particular, have not been given sufficient attention.

The G8's record on food security and nutrition has been patchy. Following the food price spikes of 2007–08, world leaders made significant commitments to addressing hunger and malnutrition at the G8 in L'Aquila, Italy in 2009. Thirteen countries signed up to the L'Aquila Food Security Initiative and promised \$22 billion to help the poorest farmers and their families. Although nutrition did not feature strongly enough in the initiative, it was seen as a step in the right direction.

However, as of July 2011, halfway through the three-year initiative, only one fifth of funding had been disbursed. The UK government has since said it had already disbursed 80% and expected to meet its commitment. Canada has disbursed nearly 90% of the \$1 billion it pledged. The USA has appropriated 90% of its \$3.5 billion pledge and disbursement is ongoing.

For significant momentum to build on nutrition it is vital that G8 heads of state and other leaders meeting at the annual summits in the USA in 2012 and in the UK in 2013 show continued leadership on nutrition. They should use their strong track record on nutrition to encourage other donor governments to follow suit. Any successor to the L'Aquila initiative presented at the forthcoming G8 summit must have a stronger focus on nutrition at its core.

It is critically important for nutrition to become part of the agenda at forthcoming G20 summit. Two members of the G20 – Brazil and Mexico – have made great progress in reducing malnutrition, while other G20 members are lagging behind. For example, nearly half of all the children in India are stunted and it is home to more than a third of the world's stunted children.²⁰ Achieving high-level political commitment from other countries at the G20 to improve nutrition would therefore be significant in tackling the global malnutrition crisis.

DONOR GOVERNMENTS AND THE GLOBAL NUTRITION SYSTEM

In addition to their roles in the G8 and G20, leaders in donor countries and in rapidly growing middle-income countries must take every opportunity to put nutrition on the global agenda and to galvanise political action. 2012 is vital year for nutrition. It is the last opportunity to get the right funding and the right programmes and systems in place to break the cycle of stunting before the 2015 deadline for the Millennium Development Goals, of which six of the eight goals are in some way dependent on nutrition.

The first 1,000 days of a child's life – from conception, through pregnancy to the child's second birthday – are critical in ensuring that the impacts of malnutrition are not permanent. By the end of April 2013, it will already be too late to make a difference to the last generation of children who will reach their second birthday in 2015. Governments must act now to give political attention at the highest level to nutrition.

Save the Children is calling for a build-up of global political momentum on food and nutrition in 2012 and to bring world leaders together to take action on nutrition before it is too late. Individual action by leaders and a series of high-level meetings have the potential to galvanise the work of the SUN movement and to create a decision-making forum that will agree how to fund nutrition; and how to make the global food system and international institutions work better for nutrition.

CONCLUSION

Solving the nutrition crisis is a great responsibility that rests on the shoulders of many. It needs concerted and co-ordinated global action as well as strong leadership at multiple levels.

Ultimately, world leaders can make the most fundamental improvements by taking high-level political action, whether that is by galvanising global commitments, starting a nutrition-related national social protection scheme, or allocating more funding to nutrition.

2012 is a vital year to get nutrition right for children and end the malnutrition crisis.

RECOMMENDATIONS

Governments in countries with high numbers of stunted children should:

- **prioritise nutrition** as a way to reduce stunting, significantly improve child health, and enhance countries' prospects for economic growth. Developing a national action plan on nutrition, with support from donors and the SUN movement, is a vital step in this process.
- **ensure that nutrition and health are integrated**, and that the role of frontline health workers is central to the national nutrition plan.
- **outline clear lines of responsibility, accountability and leadership** on nutrition within the country so that all ministries that have a role to play – health, trade and agriculture, environment and finance, plus others – are connected and working together.

International institutions, committees and movements should:

- **agree a common understanding and terminology** to explain the interplay between health, nutrition, food security and agriculture and to ensure different agencies have complementary goals.
- **work to align the efforts of various institutions**, continuing to reform the various UN bodies to reduce overlapping or competing interests and to ensure nutrition does not fall into the gaps. This includes supporting the SUN movement, which has the potential to galvanise action by bringing together many different parts of the nutrition system, and ensuring that the work of the CFS and WHA are aligned.
- **develop a target on the reduction of stunting**, which can be used to guide and inspire international efforts. Member states involved in the WHA Implementation Plan and stakeholders in the SUN movement must work together to turn the proposed global targets into a reality. The first step is to clarify the methodology used to establish the WHO targets. Work must then be carried out to ensure these targets are as ambitious, achievable and nationally-relevant as possible, and that the necessary accountability mechanisms are established.

The UN Secretary-General must:

- **demonstrate his support and backing to the Chair of the Leadership Group**, ensuring that the appropriate delegation of authority, convening power and political weight are enacted in order to secure results and sustained commitment.

Donors in rich countries and rapidly growing middle-income countries should:

- **prioritise nutrition at the G8 and G20 summits in 2012 and 2013**, ensuring full-scale and continued funding and delivery of the L'Aquila food security initiative and an increased focus on nutrition moving forward.
- **find a way to put a price tag on nutrition** and monitor funding more effectively and transparently.

All actors must:

- **support the growth and development of the civil society movement**, recognising the critical role that civil society organisations play in delivering nutrition services; in raising the political, institutional and public profile of nutrition; and in holding governments and all stakeholders to account.



OVERALL RECOMMENDATIONS

Despite some increase in international attention, progress on reducing malnutrition has been pitifully slow for a generation. These fragile gains are at risk from ongoing economic crises and instability, climate change, fluctuating global food prices, and demographic changes.

In addition, we know that by mid-2013 it will already be too late to make a difference to the last generation of children who will reach their second birthday – a vital nutritional milestone – in 2015, which marks the end point of the MDG targets.

Save the Children is calling for national and international action on six steps to achieve the transformation needed in nutrition:

- 1. Make malnutrition visible:** Chronic malnutrition is a hidden killer that kills slowly and doesn't appear on death certificates. In order to make the deaths of these children count and to make governments accountable for preventing them, there must be an agreed global target for a reduction in stunting in the countries with the highest burden.
- 2. Invest in direct interventions:** The cost of scaling up the 'Lancet package' of 13 interventions, including fortification, is \$10bn a year. Split between developing and donor governments this sum is easily affordable. It could save 2 million lives.
- 3. Fill the health worker gap:** There is a critical shortage of at least 3.5 million doctors, nurses, midwives and community health workers, who are vital in delivering the direct interventions that can improve nutrition. Governments and donors should work together to fill this health worker gap by recruiting, training and supporting new and existing health workers, and deploying them where they are most needed.
- 4. Protect families from poverty:** Many of the best examples of progress in tackling malnutrition have come from countries that have invested in effective social protection policies that reach vulnerable families. Countries should work towards establishing systems that reach pregnant and breastfeeding women, and children under two.
- 5. Harness agriculture to help tackle malnutrition:** Governments must support small-scale farmers and female farmers, and ensure that making a positive impact on nutrition is an explicit objective of agriculture policies, by focusing on projects that are designed to improve children's diet – for example, home gardening or education projects that focus on nutrition.
- 6. Galvanise political leadership:** Raising the profile of malnutrition requires a build-up of political momentum to galvanise change. The US G8 and the Mexican G20 in 2012, and the UK G8 in 2013 all offer major opportunities for progress as food, nutrition and social protection are likely to be on the agenda. These countries should work together to ensure an ambitious action plan that aligns institutional reform with clear delivery of new resources. With support from the international community, countries with high malnutrition burdens should exhibit the leadership and commitment needed to eliminate malnutrition.

Opposite: Djamila, 10, at home pounding millet. When the rains failed in 2010 in Niger, she and her mother had to leave home and go to a town to beg for food and money.

NOTES

VITAL STATISTICS

¹ M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

² R E Black, L H Allen, Z A Bhutta, et al (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 2008, Jan 19, 371 (9608), 243-60

³ R E Black, L H Allen, Z A Bhutta, et al (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 2008, Jan 19, 371 (9608), 243-60

⁴ UN Inter-agency Group for Child Mortality Estimation (2011) *Levels & Trends in Child Mortality: Report 2011*, New York: UNICEF

⁵ J Bryce, D Coitinho, et al (2008) 'Maternal and child undernutrition: effective action at national level', *The Lancet*, 2008 Feb 9;371(9611):510-26

⁶ India 2005-06 National Family Health Survey

⁷ See note 1 above.

⁸ National Demographic and Health Surveys

⁹ See Introduction, note 5.

¹⁰ B Fenn (2011) Consultancy on behalf of Save the Children UK as part of the EVERY ONE campaign report

¹¹ S Grantham-McGregor et al (2007) 'Development potential in the first 5 years for children in developing countries', *The Lancet*, 369:60-70

EXECUTIVE SUMMARY

¹ Based on calculation that 35% of child deaths are attributable to undernutrition (Black et al, *Lancet*, January 2008) and there were 7.6 million child deaths in 2010 (UNICEF, 2011, *Levels and Trends in Child Mortality 2011*).

² M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

³ S Horton (1999) 'Opportunities for investments in low income Asia', *Asian Development Review*, 17, p.246-73

⁴ S Grantham-McGregor, et al 'Development potential in the first 5 years for children in developing countries', *The Lancet*, 369: 60-70, 2007

⁵ See Introduction, note 5.

⁶ S Horton (1999) 'Opportunities for investments in low income Asia', *Asian Development Review*, 17, p.246-73; World Bank (2010) *Scaling Up Nutrition: What will it cost?*

⁷ *The Lancet*, 'Maternal and Child Undernutrition', Special Series, January, 2008

⁸ World Bank (2010) *Scaling Up Nutrition: What will it cost?*, <http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/ScalingUpNutrition.pdf>

⁹ Although this is a large price tag, the benefits well outweigh the costs. Iron fortification would bring US\$4.8 billion in benefits (at an 8:1 benefit: cost ratio) and iodine fortification would yield US\$2.4 billion in benefits (at a 30:1 benefit: cost ratio). Those two interventions alone would cover the initial up-front investment.

¹⁰ Save the Children (2009) *Hungry for Change: An eight-step, costed plan of action to tackle global child malnutrition*

¹¹ Food and Agriculture Organization (2011) *The State of Food and Agriculture: Women in agriculture – Closing the gender gap for development*

INTRODUCTION

¹ M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

² M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

³ R E Black, L H Allen, Z A Bhutta, et al (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 2008, Jan 19, 371 (9608), 243-60

⁴ This figure was calculated by extrapolating stunting prevalence rates for each of the four sub-Saharan UN sub-regions based on trends in prevalence between 1990-2010 provided by de Onis et al (2011) (see previous note), and on the basis of exponential annual reduction rates. The estimated prevalences for 2020 and 2025 were then multiplied by sub-region-specific population estimates as taken by the medium variants of the UN's World Population Prospects, 2010 revision. The resulting estimate of total stunted in 2020 differs somewhat from the estimates presented by de Onis et al. (our estimate is 62.6m, while theirs is 59.6m). Sensitivity analysis using the 2008 revision of World Population Prospects confirms that this discrepancy is due to differences between the two population revisions. Therefore, our statistics present a more accurate up-to-date estimate of the numbers who will be stunted in 2020 and beyond, if rates of progress that have been observed over the past two decades continue for two more in sub-Saharan Africa.

⁵ Linear interpolation of the prevalence rates of stunting in each sub-region, as provided by de Onis et al (2011) (see note 1) provides prevalence estimates for 2012 and 2017; while for 2022 the linear progress made in each sub-region between 2015 and 2020 is assumed to continue for a further two years. The resulting sub-region-specific prevalences are then applied to population estimates for 2012, 2017 and 2022 from the UN World Population Prospects, 2010 revision. Summing these three years' estimates of global numbers stunted gives an estimate of the total number of children who will be affected by stunting globally over the next 15 years (as each point estimate is for numbers of children under five and as such effectively includes five years' worth of children). However, the figure is likely to be an underestimate, as estimates for two single points five years apart will 'miss' those children who are stunted but who die before they are five years old.

- ⁶ M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7
- ⁷ J Bryce, D Coitinho, et al (2008) 'Maternal and child undernutrition: effective action at national level', *The Lancet*, 2008 Feb 9;371(9611):510-26
- ⁸ Republic of Madagascar (2010) Madagascar Demographic Health Survey 2008-09
- ⁹ India 2005-2006 National Family Health Survey
- ¹⁰ S J Lloyd, R S Kovats and Z Chalabi (2011) 'Climate change, crop yields, and undernutrition: development of a model to quantify the impact of climate scenarios on child undernutrition', *Environmental Health Perspectives*, 119(12); doi:10.1289/ehp.1003311
- ¹¹ Save the Children (2011) *Costing Lives: The devastating impact of rising and volatile food prices*
- ¹² World Bank (2010) *Global Monitoring Report: The MDGs after the Crisis*, p.6
- ¹³ UN World Population Prospects: the 2010 revision
- ¹⁴ The UN Convention on the Rights of the Child, the International Covenant on Economic, Social and Cultural Rights, and the UN Convention on the Elimination of all forms of Discrimination Against Women have committed states to protect the nutritional well-being of women and children.
- ¹⁵ 'Complete coverage' is defined as 99% coverage rates for each intervention. See Z A Bhutta et al (2008) 'What works? interventions for maternal and child undernutrition and survival', *The Lancet*, January 17, 2008
- ¹⁶ Z A Bhutta et al (2008) 'What works? interventions for maternal and child undernutrition and survival', *The Lancet*, January 17, 2008

I THE GLOBAL MALNUTRITION CRISIS

- ¹ Based on calculation that 35% of child deaths are attributable to undernutrition (Black et al, *Lancet*, January 2008) and there were 7.6 million child deaths in 2010 (UNICEF, 2011, *Levels and Trends in Child Mortality 2011*).
- ² Opening address by Kristalina Georgiova, European Commissioner for International Co-operation, Humanitarian Aid and Crisis Response, at the Conference 'Combating Malnutrition through Sustainable Interventions: EU-ASEAN relations as a key driver', 8 November 2011, Brussels
- ³ M H N Golden (1988) 'The role of individual nutrient deficiencies in growth retardation of children as exemplified by zinc and protein', In: J C Waterlow (ed) (1988) *Linear Growth Retardation in Less Developed Countries*, New York: Raven press
- ⁴ World Bank (2006) *Repositioning Nutrition as Central to Development: A strategy for large-scale action*
- ⁵ This figure is based on 13.3m people in need of humanitarian assistance (OCHA, Horn of Africa Crisis, Situation Report No. 27, 16 December 2011 – <http://www.reliefweb.int/sites/reliefweb.int/files/resources/OCHA%20HoA%20Situation%20Report%20No.%2027.pdf>). At a minimum half of these will be children, based on monitoring in our programme areas.

⁶ World Health Organization (2011) Tuberculosis: 2010/11 global facts, http://www.who.int/tb/publications/2011/factsheet_tb_2011.pdf

⁷ World Health Organization, *Malaria*, Factsheet no. 94, December 2011, <http://www.who.int/mediacentre/factsheets/fs094/en/>

⁸ M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

⁹ World Health Organization, *Malaria*, Factsheet no. 94, December 2011, <http://www.who.int/mediacentre/factsheets/fs094/en/>

¹⁰ In the technical nutrition community, malnutrition can refer to a child being both over and underweight, but for the purposes of this report we will take it to mean underweight.

¹¹ Nandy et al, 'Poverty, child undernutrition and morbidity: new evidence from India', *Bulletin of the WHO*, March 2005, 83 (3)

¹² N S Scrimshaw and J P San Giobanni (1997) 'Synergism of nutrition, infection, and immunity: an overview', *American Journal of Clinical Nutrition*, Vol 66, 464S-477S

¹³ See 1,000 Days Partnership website: <http://www.thousanddays.org/about/>

¹⁴ M H N Golden (1988) 'The role of individual nutrient deficiencies in growth retardation of children as exemplified by zinc and protein', In: J C Waterlow (ed) (1988) *Linear Growth Retardation in Less Developed Countries*, New York: Raven press

¹⁵ WHO Multicentre Growth Reference Study Group (2009) *WHO Child Growth Standards: Growth velocity based on weight, length and head circumference: Methods and development*, Geneva: World Health Organization

¹⁶ Mean height for UK children is calculated based on mean Z-scores taken from the Avon Longitudinal Study of Parents and Children (C Wright, et al, Implications of adopting the WHO 2006 Child Growth Standard in the UK: two prospective cohort studies, *Archives of Disease in Childhood*, 2008;93:566-569. Table 1)

¹⁷ World Health Organization, Global Database on Child Growth and Malnutrition, Wasting trends in numbers affected (1990-2010), http://www.who.int/nutgrowthdb/wasting_n1990_2010.pdf

¹⁸ WHO Multicentre Growth Reference Study Group (2009) *WHO Child Growth Standards: Growth velocity based on weight, length and head circumference: Methods and development*, Geneva: World Health Organization

¹⁹ The technical definition of stunting is that a child's height (or length) compared to their age is 2 or more standard deviations below the median of the WHO Child Growth Standard 2007. The heights in the chart refer to crude averages of all countries that have had a national DHS survey for which anthropometric data is available (www.measuredhs.com). Average height at 30 months was calculated on the basis of the mean z-scores for the 24-35 month age-group, using the WHO standard reference; each country's average height was therefore given by $M+z*S$, where M is the sex-specific WHO population average height at 30 months; z is the mean z-score in the country for the 24-35 age group, and S is the standard deviation at 30 months for the WHO population. For comparison, the average UK height was calculated based on a z-score

taken from the Avon Longitudinal Study of Parents and Children (<http://adc.highwire.org/content/93/7/566.full.pdf>).

²⁰ One of the main reasons children are anaemic in many settings is because of hookworm infection, even if they get enough to eat (J L Smith and S Brooker, 2010, 'Impact of hookworm infection and deworming on anaemia in non-pregnant populations: a systematic review', *Tropical Medicine & International Health*, 15(7): 776–795).

²¹ R E Black, L H Allen, Z A Bhutta, et al (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 2008, Jan 19, 371 (9608), 243–60

²² World Health Organization (2009) WHO Global Database on Vitamin A Deficiency

²³ Y Balarajan, et al, 'Anaemia in low-income and middle-income countries', *The Lancet*, 378: 2123–35, August 2, 2011

²⁴ World Health Organization (2001) *Iron Deficiency Anaemia: Assessment, prevention, and control – A guide for programme managers*

²⁵ World Health Organization (2008) *Worldwide Prevalence of Anaemia 1993–2005*, http://whqlibdoc.who.int/publications/2008/9789241596657_eng.pdf

²⁶ M Ezzati, A D Lopez, A A Rodgers, C J L Murray (2004) *Comparative Quantification of Health Risks: Global and regional burden of disease attributable to selected major risk factors*, Geneva, Switzerland: World Health Organization

²⁷ Save the Children (2009) *Hungry for Change: An eight-step, costed plan of action to tackle global child malnutrition*, p.7

²⁸ M S Kramer and R Kakuma (2002) *The Optimal Duration of Exclusive Breastfeeding: A systematic review*, World Health Organization

²⁹ B Fenn (2011) Consultancy on behalf of Save the Children UK as part of the EVERY ONE campaign report

³⁰ R Martorell et al (2010) 'Weight gain in the first two years of life is an important predictor of schooling outcomes', *Journal of Nutrition*, 140(2) pp348–54

³¹ N Bleichrodt and M P Born (1994) 'A meta-analysis of research on iodine and its relationship to cognitive development', In: J B Stanbury, ed. *The Damaged Brain of Iodine Deficiency*, New York: Cognizant Communication, 195–200

³² S Grantham-McGregor et al (2007) 'Development potential in the first 5 years for children in developing countries', *The Lancet*, 369:60–70

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- ³⁷ J Hoddinott et al (2008) 'Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults', *The Lancet*, 371, 9610, pages 411–16
- ³⁸ World Bank (2006) *Repositioning Nutrition as Central to Development: A strategy for large scale action*
- ³⁹ S Horton (1999) 'Opportunities for investments in low income Asia', *Asian Development Review*, 17, p.246–73; World Bank (2010) *Scaling Up Nutrition: What will it cost?*
- ⁴⁰ Food and Agriculture Organization, *The State of Food Insecurity in the World 2004*
- ⁴¹ R E Black, L H Allen, Z A Bhutta, et al (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 2008, Jan 19, 371 (9608), 243–60
- ⁴² S Horton, H Alderman and J A Rivera (2008) *Hunger and malnutrition*, Copenhagen Consensus 2008 challenge paper, Copenhagen Consensus Center
- ⁴³ B Fenn (2011) Consultancy on behalf of Save the Children UK as part of the EVERY ONE campaign report
- ⁴⁴ B Fenn (2011) Consultancy on behalf of Save the Children UK as part of the EVERY ONE campaign report
- ⁴⁵ B Fenn (2011) Consultancy on behalf of Save the Children UK as part of the EVERY ONE campaign report
- ⁴⁶ Using the most recent population data, the number of children who were stunted in 2010 is estimated to be 170.1 million. If all countries had followed Bangladesh's rate of 3% annual reduction since 1990, the equivalent estimate would be 142.8 million.
- ⁴⁷ Peru DHS: Instituto Nacional de Estadística e Informática (INEI), Peru Demographic and Health Survey 2010, Final Report. Lima 2011
- ⁴⁸ This graph aims to show stunting prevalence by quintile within countries. It does not reflect that households in quintiles across countries have the same level of wealth. As such, cross-country conclusions based on the graph should not be made.
- ⁴⁹ L Smith et al (2003) *The Importance of Women's Status for Child Nutrition in Developing Countries*, Research Report 131, International Food Policy Research Institute (IFPRI)
- ⁵⁰ A Millman et al (2005) 'Differential improvement among countries in child stunting is associated with long-term development and specific interventions', *Journal of Nutrition*, June 1, 2005, vol. 135 no. 6, 1415–1422
- ⁵¹ Food and Agriculture Organization (2008) *Agricultural mechanization in Africa...Time for action: Planning investment for enhanced agricultural productivity*, Report of an Expert Group Meeting January 2008, Vienna, Austria
- ⁵² M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1–7
- ⁵³ This figure was calculated by extrapolating stunting prevalence rates for each of the four sub-Saharan UN sub-regions based on trends in prevalence between 1990–2010 provided by de Onis et al (2011) (see previous note), and on the basis of exponential annual reduction rates. The estimated prevalences for 2020 and 2025 were then

multiplied by sub-region-specific population estimates as taken by the medium variants of the UN's World Population Prospects, 2010 revision. The resulting estimate of total stunted in 2020 differs somewhat from the estimates presented by de Onis et al. (our estimate is 62.6m, while theirs is 59.6m). Sensitivity analysis using the 2008 revision of World Population Prospects confirms that this discrepancy is due to differences between the two population revisions. Therefore, our statistics present a more accurate up-to-date estimate of the numbers who will be stunted in 2020 and beyond, if rates of progress that have been observed over the past two decades continue for two more in sub-Saharan Africa.

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⁵⁸ *The Economist*, 'Africa's impressive growth', 6 January 2011, http://www.economist.com/blogs/dailychart/2011/01/daily_chart

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⁶³ P Verwimp, T Bundervoet and R Akresh (2010) *The Impact of Violent Conflict on Child Health: What are the channels?*, MICROCON Policy Briefing 6

⁶⁴ World Health Organization and UNICEF (2010) *Countdown to 2015 – decade report (2000-2010): Taking stock of maternal, newborn and child survival*, Geneva: WHO Press

2 DIRECT INTERVENTIONS TO TACKLE MALNUTRITION

¹ *The Lancet*, 'Maternal and Child Undernutrition', Special Series, January, 2008

² World Bank. *Repositioning Nutrition as Central to Development: A strategy for large-scale action*, Washington DC: The International Bank for Reconstruction and Development, 2006. Although this is a large price tag, the benefits well outweigh the costs. Iron fortification, for example, would bring US\$4.8 billion in benefits (at an 8:1 benefit: cost ratio).

³ Scaling Up Nutrition, *A Framework for Action*, 2010

⁴ J Bryce, S el Arifeen, G Pariyo, C Lanata, D Gwatkin and J P Habicht, 'Reducing child mortality: can public health deliver? *The Lancet*, 2003 July 12, 362(9378), 159–64

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⁶ Johns Hopkins University is currently running a new analysis of these figures which were not yet available as this report went to press.

⁷ Y Sguassero, Optimal duration of exclusive breastfeeding: RHL commentary (last revised: 28 March 2008), The WHO Reproductive Health Library, World Health Organization, http://apps.who.int/rhl/pregnancy_childbirth/care_after_childbirth/yscom/en/index.html

⁸ World Health Organization (2010) Infant and young child feeding, Fact sheet No 342, July 2010, <http://www.who.int/mediacentre/factsheets/fs342/en/index.html>

⁹ Nigeria Demographic and Health Survey 2008

¹⁰ This figure is calculated as 70% of an estimated 8.0 million children aged 6–23 months in Nigeria (calculated as 30% the 0–4 population taken from World Population Prospects, the 2010 revision).

¹¹ World Bank (1994) *Enriching Lives: Overcoming vitamin and mineral malnutrition in developing countries*

¹² Pakistan National Nutritional Survey 2011 p.79

¹³ UNICEF. *Programming Guide: Infant and young child feeding*, 2011

¹⁴ WHO (2008) Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6–8 November 2007 in Washington D.C., USA.

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- ²² Food and Agriculture Organization, *Micronutrient Fortification of Food: Technology and quality control*, 1995, <http://www.fao.org/docrep/W2840E/w2840e0b.htm>
- ²³ S Horton et al., Copenhagen Consensus, *Micronutrient Fortification (Iron and Salt Iodization)*, 2008, <http://www.copenhagenconsensus.com/Default.aspx?ID=1303>
- ²⁴ Flour Fortification Initiative, UNICEF et al, *Investing in the Future: A united call to action on vitamin and mineral deficiencies*, 2009, http://www.gainhealth.org/sites/default/files/report/investing_in_the_future_pdf_11749.pdf
- ²⁵ The panel ranked vitamin A and zinc supplements for children as the most effective, the Doha development round as second and expanded immunisation coverage for children as the fourth most cost-effective development interventions. See: Copenhagen Consensus 2008, <http://www.copenhagenconsensus.com/Home.aspx>
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- ²⁷ World Health Organization website, on Nutrition: Micronutrient deficiencies, <http://www.who.int/nutrition/topics/idd/en/>
- ²⁸ World Bank, *Scaling Up Nutrition: What will it cost?*, 2010, <http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/ScalingUpNutrition.pdf>
- ²⁹ Although this is a large price tag, the benefits well outweigh the costs. Iron fortification would bring US\$4.8 billion in benefits (at an 8:1 benefit: cost ratio) and iodine fortification would yield US\$2.4 billion in benefits (at a 30:1 benefit: cost ratio). Those two interventions alone would cover the initial up-front investment.
- ³⁰ C Hotz et al, 'A large-scale intervention to introduce orange sweet potato in rural Mozambique increases vitamin A intakes among children and women', *British Journal of Nutrition*, 2011, <http://journals.cambridge.org/download.php?file=%2FBJN%2FS0007114511005174a.pdf&code=1d01bc1b980216d88a9e7b504bdd5319>
- ³¹ This reduction is due to the fact that some micronutrients like B12 or iron are usually only available in more costly foods, such as beef liver and small dried fish. See R Frega et al, Food and Nutrition Bulletin Supplement, Measurement of Food Consumption for Food Fortification and other Nutritional Purposes: Methods, Applications and Policy Implications, *What Linear Optimization Contributes: WFP experience with the 'Cost of the Diet' tool*
- ³² Flour Fortification Initiative, The Global Alliance For Improved Nutrition, Micronutrient Initiative, UNICEF, USAID, World Bank and World Health Organization, *Investing in the Future: A united call to action on vitamin and mineral deficiencies*, Global report 2009, http://www.gainhealth.org/sites/default/files/report/investing_in_the_future_pdf_11749.pdf
- ³³ The addition of vitamin A to staples has already proven effective. In combination with targeted supplementation, for example, vitamin A fortification of sugar has virtually eliminated vitamin A deficiency in Guatemala and has substantially reduced it in El Salvador and Honduras. See: UNICEF, *Handbook on Legislative Reform: Realising*

children's rights, Volume 1, 2008. p. 233, http://www.unicef.org/crc/files/Handbook_on_Legislative_Reform.pdf

³⁴ Mandatory fortification, which creates a level playing field for millers and producers, is likely to be the most successful way to increase access and affordability to fortified foods. Governments must enforce food standards and regulations, as well as quality control and assurance procedures, to ensure high-quality fortification at the point of production. Government contributions may include exemption from duties and taxes on the imported components of both equipment and premixes, or the inclusion of premix costs in the national drug budget. Strong and sustained political support, therefore, is a key determinant of successful mass fortification programmes.

³⁵ Flour Fortification Initiative, The Global Alliance For Improved Nutrition, Micronutrient Initiative, UNICEF, USAID, World Bank and World Health Organization, *Investing in the Future: A united call to action on vitamin and mineral deficiencies*, Global report 2009, http://www.gainhealth.org/sites/default/files/report/investing_in_the_future_pdf_11749.pdf

³⁶ Harvest Plus, *Harvest Plus Crop Strategies*, 2012, http://www.harvestplus.org/sites/default/files/HarvestPlus_Crop_Strategies_July2011.pdf

³⁷ Bio-fortification is being pioneered by universities, agricultural research institutes and organisation such as Harvest Plus, who are playing a critical role in developing the techniques to breed, test, distribute and market fortified staple crops to increase their availability and use at the farm and community level.

³⁸ P Nestel et al, 'Biofortification of staple food crops', *The Journal of Nutrition*, 136:1064–67, April 2006 <http://jn.nutrition.org/content/136/4/1064.full>

³⁹ HarvestPlus, Statement on the potential benefits of biofortification on the nutritional status of populations, http://www.dfid.gov.uk/r4d/PDF/Outputs/Misc_Crop/HarvestPlus_statement_benefits_of_biofortification.pdf

⁴⁰ Evidence matters, Issue 1, November 2011, 'Zero child hunger: breaking the cycle of malnutrition', available at <http://www.3ieimpact.org/userfiles/doc/Evidence%20Matters%20November.pdf>

⁴¹ FAO, *Preventing Micronutrient Malnutrition: A guide to food-based approaches*, http://www.fao.org/docrep/X5244E/X5244e04.htm#P874_102845

⁴² Kellogg's, for example, fortified its first breakfast cereal in the 1930s: <http://www.kellogghistory.com/history.html>

⁴³ Global Alliance for Improved Nutrition, *Project to Promote Fortified Complementary Foods for Young Children*, <http://www.gainhealth.org/project/projet-de-promotion>

⁴⁴ World Health Organization, *International Code of Marketing of Breast-milk Substitutes*, 1981 http://www.who.int/nutrition/publications/code_english.pdf

⁴⁵ The Code was developed with the principle aim of regulating breast-milk substitutes, bottles and teats, and provides less guidance on the appropriate marketing of complementary foods. Manufacturers and distributors of complementary foods should interpret the Code conservatively to uphold the spirit and the letter in which it was developed.

⁴⁶ Home Fortification Technical Advisory Group, *Programmatic Guidance Brief on Use of Micronutrient Powders (MNP) for Home Fortification*

⁴⁷ Home Fortification Technical Advisory Group, *Programmatic Guidance Brief on Use of Micronutrient Powders (MNP) for Home Fortification*

⁴⁸ Flour Fortification Initiative, The Global Alliance For Improved Nutrition, Micronutrient Initiative, UNICEF, USAID, World Bank and World Health Organization, *Investing in the Future: A united call to action on vitamin and mineral deficiencies*, Global report 2009, p.24, http://www.gainhealth.org/sites/default/files/report/investing_in_the_future_pdf_11749.pdf

⁴⁹ In 2007, the government of Bolivia became the first to provide free public distribution of multiple micronutrient powders on a national scale and reached approximately 750,000 young children. See: http://www.gainhealth.org/sites/default/files/report/investing_in_the_future_pdf_11749.pdf

⁵⁰ UNICEF, *Global Assessment of Home Fortification Interventions*, May 2011, <http://www.ilins.org/Ins-research-network/minutes/2011-04-08/19.%20Irizarry%20LNS%20mtg%20April%202011%20Global%20assessment%20of%20HF%20interventions%20UNICEF%20CDC.pdf>

⁵¹ Home Fortification Technical Advisory Group, *Programmatic Guidance Brief on Use of Micronutrient Powders (MNP) for Home Fortification*

⁵² For example, a randomised control trial in Pakistan in children with a recent history of diarrhoea found an 11% reduction in the longitudinal prevalence of diarrhoea among children 6–12 months of age in the Sprinkles group compared to the placebo group. See: W Shaireef et al, 'Economic gains of a home fortification program', *Revue Canadienne de Santé Publique*, Volume 91, No 1 <http://www.gainhealth.org/hftag/sites/default/files/Economic%20Gains%20of%20a%20Home%20Fortification%20Program.pdf>

⁵³ C Best et al, 'Can multi-micronutrient food fortification improve the micronutrient status, growth, health, and cognition of schoolchildren? A systematic review', *Nutrition Reviews*, 69 (4):186–204, April 2011

⁵⁴ World Bank, *Scaling Up Nutrition: What Will It Cost?*, 2010, <http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/ScalingUpNutrition.pdf>

⁵⁵ Unpublished presentation to the Indonesia Ministry of Health provided by Romeo Frega, Policy & Strategy Division, World Food Programme

⁵⁶ One study estimated that the cost per death averted through MNP programming is US\$406, the cost per DALY saved is \$12.2 and a gain in earnings of \$37 (\$18–51) for each dollar spent on the program.

⁵⁷ S Horton et al, Copenhagen Consensus 2008, *Challenge Paper: Malnutrition and hunger*, p. 11, <http://www.copenhagenconsensus.com/Default.aspx?ID=1149>

⁵⁸ World Bank, 2010, *Scaling Up Nutrition: What will it cost?*, <http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/ScalingUpNutrition.pdf>

⁵⁹ The most commonly used are Plumpy Doz, Supplementary Plumpy, and Nutributter

⁶⁰ They can be eaten directly from the packet and do not need to be cooked – saving families time and energy, and reducing the risk of contamination from unsafe preparation. They can be stored in the home for at least one year.

⁶¹ S Adu-Afarwuah et al, 'Randomized comparison of 3 types of micronutrient supplements for home fortification of complementary foods in Ghana: effects on growth and motor development', *American Journal of Clinical Nutrition*, August 2007: 86(2):412, <http://www.gainhealth.org/hftag/documents/randomized-comparison-3-types-micronutrient-supplements-home-fortification-complementary-f>

⁶² UNICEF/WHO/WFP Asia-Pacific Regional Workshop, 25–27 March 2010, *Complementary food supplements and fortified complementary foods in the context of IYCF programs*, <http://ilins.org/lms-research-network/minutes/2010-03-25/WFP%20-%20LNS%20and%20FBF%20for%20IYCN%20BKK%2025Mar10.pdf>

⁶³ IRIN, *Making peanut butter gets stickier*, November 2009, <http://www.irinnews.org/PrintReport.aspx?ReportId=86979>

⁶⁴ Domestic legislation should be based on relevant international standards, including the various Codex Alimentarius standards. National standards should also comply with international trade agreements (specifically the WTO Agreement on Technical Barriers to Trade) and apply equally to manufacturers and importers.

⁶⁵ Examples include: uncertainty in their content or application (to importers and domestic producers); inflexibility in the procedure for amending the relevant laws or regulations, including an inability to update with the emergence of new scientific evidence; overly prescriptive or restrictive provisions or where they create complex licensing or registration procedures.

⁶⁶ Directorate of Health, Bangladesh Standards and Testing Institution (BSTI), Directorate General of Food, Ministry of Local Government, Ministry of Commerce and the Ministry of Industry. For example, the Institute of Public Health performs microbiological and toxicological testing for the licensing of food from outside Bangladesh, but has no legal mandate to regulate food. The BSTI, established under the Ministry of Industry, has the responsibility in law for setting national standards and for standardising food products.

⁶⁷ There was a delay for the import approval of DSM's MixMe by WFP for the use in the Cyclone Sidr emergency response.

⁶⁸ Interview with Sree Kartha, Head of Strategic Planning, Renata Industries, 17 October 2011

⁶⁹ Low-priced market-driven interventions will only be viable for businesses if sales volumes are high enough to generate a return. This creates an additional challenge to the private sector as it necessarily entails lengthy and costly social marketing campaigns. Increasing demand for fortified products is likely to necessitate the coordination of nutritional education, and social and commercial marketing campaigns to create that demand and behaviour change.

⁷⁰ Interview with Fokko Wientjes, Corporate Sustainable Development, Global Partnership WFP, DSM

⁷¹ World Health Organization and Food and Agriculture Organization, 2006, *Guidelines on Food Fortification with Micronutrients*, http://www.who.int/nutrition/publications/guide_food_fortification_micronutrients.pdf, p. 224

⁷² *The Lancet*, 'Maternal and Child Undernutrition', Special Series, January, 2008

⁷³ J Bryce, S el Arifeen, G Pariyo, C Lanata, D Gwatkin and J P Habicht, 'Reducing child mortality: can public health deliver? *The Lancet*, 2003 July 12, 362(9378), 159–64

⁷⁴ Comprehensive nutrition packages include: breastfeeding promotion/support and complementary feeding education; implementing a social protection system to support poor families; investing in agriculture and livelihood strategies that improve access to and availability of a diverse range of foods; and supporting early warning systems to help prevent acute food crises.

3 SOCIAL PROTECTION AND NUTRITION

¹ Save the Children (2009) *Hungry for Change: An eight-step, costed plan of action to tackle global child malnutrition*

² World Bank, Food Price Watch, February 2011, http://www.worldbank.org/foodcrisis/food_price_watch_report_feb2011.html

³ J S Compton, S Wiggins and S Keats (2010), *Impact of the Global Food Crisis on the Poor: What is the evidence?*, London: Overseas Development Institute

⁴ UK Hunger Alliance (2011) *Tackling the High Food Price Challenge: Five recommendations to G20 members*

⁵ For a summary of the evidence see Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

⁶ A Barrientos and M Niño Zarazúa (2011) *Social Transfers and Chronic Poverty: Objectives, design, reach and impact*, Chronic poverty research centre,

⁷ Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

⁸ Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

⁹ Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

¹⁰ Save the Children (2011) *Costing Lives: The devastating impact of rising and volatile food prices*

¹¹ For an overview, see Food and Agriculture Organization (2010) 'Price volatility in agricultural markets: evidence, impact on food security and policy responses', *Economic and Social Perspectives*, December 2010.

¹² World Bank, Food Price Watch, February 2011, http://www.worldbank.org/foodcrisis/food_price_watch_report_feb2011.html The level of price transmission varies from country to country and depends on multiple factors including trade, transport conditions and national policies, such as tax rates.

¹³ Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

¹⁴ UK Office of National Statistics, *A Report on the Living Costs and Food Survey 2009*

¹⁵ Save the Children UK (2009) *How the Global Food Crisis is Hurting Children: The impact of the food price hike on a rural community in northern Bangladesh*

¹⁶ Standing Committee on Nutrition (2008) *The Impact of High Food Prices on Maternal and Child Nutrition*, Background Paper for the SCN Side Event at the 34th Session of the Committee on World Food Security. Rome, 14–17 October 2008

¹⁷ S Ravi and M Engler (2009) *Workfare in Low Income Countries: An effective way to fight poverty? The case of NREGS in India*, available at <http://ssrn.com/abstract=1336837>

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¹⁹ J Hoddinott, E Skoufias and R Washburn (2001) *The impact of PROGRESA on consumption*, International Food Policy Research Institute, http://www.3ieimpact.org/admin/impact_evaluations/The%20Impact%20of%20PROGRESA%20on%20Consumption.pdf

²⁰ For an overview of health and nutrition outcomes of cash transfers see Appendix 3 in Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

²¹ C G N Mascie-Taylor, M K Marks, R Goto and R Islam (2010) 'Impact of a cash-for-work programme on food consumption and nutrition among women and children facing food insecurity in rural Bangladesh', *Bulletin of the World Health Organization* 2010;88:854–860 <http://www.who.int/bulletin/volumes/88/11/10-080994/en/>

²² D Rindhar and A Duffield (2006) *A review of the impact of cash transfer programmes on child nutritional status and some implications for Save the Children UK Programmes*, London: Save the Children UK

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²⁴ K Macours, N Schady and R Vakis (2008) *Cash transfers, behavioral changes, and the cognitive development of young children: Evidence from a randomized experiment*, World Bank, http://siteresources.worldbank.org/INTLACREGTOPPOVANA/Resources/MacoursSchadyVakis_041108.pdf

²⁵ The Chicago Council on Global Affairs (2011) *Girls Grow: A vital force in rural economics*,

²⁶ Save the Children (2009) *Lasting Benefits: The role of cash transfers in tackling child mortality*

²⁷ L C H Fernald, P J Gertler and L M Neufeld (2009) '10-year effect of Oportunidades, Mexico's conditional cash transfer programme, on child growth, cognition, language, and behaviour: a longitudinal follow-up study', *The Lancet*, 2009, 374, 1997–2005

²⁸ A U Ahmed et al, *Comparing Food and Cash Transfers to the Ultra Poor in Bangladesh*, 2009, IFPRI Research Monograph 163, Washington D.C.; A Barrientos et al, *Social Assistance in Developing Countries Database*. Brooks World Poverty Institute, Chronic Poverty Research Centre

²⁹ See J Luckhurst, *Improving girls' education in Bangladesh*, <http://www.aideffectiveness.org/busanhlf4/improving-girls-education-in-bangladesh.html>

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- ³⁴ Department for International Development (2011) Cash Transfers Evidence Paper, <http://www.dfid.gov.uk/r4d/PDF/Articles/Evidence-Paper-FINAL-CLEAR2.pdf>
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- ⁴⁷ IFPRI (2003) *The Importance of Women's Status for Child Nutrition in Developing Countries*, Washington DC

⁴⁸ Save the Children (2011) *An Equal Start: Why gender equality matters for child survival and maternal health*

⁴⁹ However, programmes must also be mindful of the risk of increasing the workload of women by introducing impractical conditions or reinforcing traditional gender roles.

⁵⁰ O Attanasio and V Lechene (2010) *Conditional Cash Transfers, Women and the Demand for Food*, IFS Working Paper 10/17, Insititute for Fiscal Studies

4 HARNESSING THE POTENTIAL OF AGRICULTURE TO TACKLE MALNUTRITION

¹ L Haddad (2010) *From Harvest Plus to Harvest Driven: How to realise the elusive potential of agriculture for nutrition?*, Available at <http://www.scribd.com/doc/42020607/Bio-Fortification-Conference-2010-Oct-28-Lawrence-Haddad>

² Foresight (2011) *The Future of Food and Farming* defines a food system as follows: “All processes involved in providing food and food-related items to a population, including growing, harvesting, processing, packaging, transporting, marketing, consumption and disposal. The system also includes the inputs required and outputs generated at each step where such steps may be connected to a more extensive regional or global system” (p.202). See also P Pinstrup-Andersen (2011) *The food system and its interaction with human health and nutrition*, 2020 Conference Brief 13, for a definition of food systems.

³ World Food Programme website: <http://www.wfp.org/hunger/stats>

⁴ World Health Organization, World Food Programme and UNICEF (2007) *Preventing and controlling micronutrient deficiencies in populations affected by an emergency* (joint statement), http://www.who.int/nutrition/publications/WHO_WFP_UNICEFstatement.pdf

⁵ Foresight (2011) *The Future of Food and Farming* defines and considers the combined effect of six drivers of change influencing the food system.

⁶ Agricultural policies can also improve nutrition in other ways, including by increasing the availability of affordable nutritious food.

⁷ D J Spielman and R Pandya-Lorch (2009) *Millions Fed: Proven successes in agricultural development*, IFPRI

⁸ World Bank (2007) *From Agriculture to Nutrition: Pathways, synergies and outcomes*

⁹ For an overview of the interaction between livestock interventions and human health, including some of the associated threats to health and nutrition, such as zoonotic diseases transmitted from animals to humans or a disease that normally exists in animals but that can infect humans, see T Randolph, E Schelling, D Grace, C F Nicholson, J L Leroy, D C Cole, M W Demment, A Omore, J Zinsstag and M Ruel (2007) ‘Invited Review: Role of livestock in human nutrition and health for poverty reduction in developing countries’, *Journal of Animal Science*.

¹⁰ P Hazell, C Poulton, S Wiggins and A Dorward (2007) *The Future of Small Farms for Poverty Reduction and Growth*, 2020 Discussion Paper 42, IFPRI

¹¹ It is worth noting that spending on items other than nutritious food can have an impact on nutrition. For example, the purchase of productive assets such as tools or

livestock can increase future food security, and increased investments in healthcare or education can impact on nutrition.

¹² Save the Children (2009) *Hungry for Change: An eight-step, costed plan of action to tackle global child malnutrition*. Using the Household Economy Approach, *Hungry for Change* shows that in Ethiopia, Bangladesh, Kenya, the Democratic Republic of Congo and Sudan the poor secure no more than 40–50% of their food energy needs from their own production.

¹³ World Bank (2005) *Gender and 'Shared Growth' in Sub-Saharan Africa*, Washington D.C.: World Bank

¹⁴ C M Blackden and R Sudharshan Canagarajah (2003) *Gender and Growth in Africa: Evidence and issues*, Uganda: World Bank

¹⁵ Food and Agriculture Organization, Gender and Food Security: Division of labor, <http://www.fao.org/Gender/en/lab2-e.htm>

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²² Food and Agriculture Organization (1997) Human Nutrition in the Developing World, available at http://www.fao.org/DOCREP/W0073e/w0073e07.htm#P8400_1069620

²³ See Food Forum website, 'Food in the national curriculum: Balanced diet or seriously malnourished?', http://www.foodforum.org.uk/hot/National_Curriculum-Tea-Fis.shtml

²⁴ E Masset, L Haddad, A Cornelius and J Isaza-Castro (2011) *A Systematic Review of Agricultural Interventions that Aim to Improve Nutritional Status of Children*, London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London

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²⁶ Evidence Matters, 'Zero Child Hunger: Breaking the cycle of malnutrition', 3ie-IDS brief, Issue 1, November 2011

²⁷ J Hodinott (2011) Agriculture, health and nutrition: Toward conceptualizing the linkages, IFPRI 2020 Conference Paper 2

²⁸ J Beddington et al (2011) *Achieving Food Security in the Face of Climate Change: Summary for policy makers from the Commission on Sustainable Agriculture and Climate Change*,

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark

²⁹ See previous note.

³⁰ M Rosengrant, 'The perfect storm: Food security and nutrition under climate change', Symposia brief, November 2010

³¹ J Beddington et al (2011) *Achieving Food Security in the Face of Climate Change: Summary for policy makers from the Commission on Sustainable Agriculture and Climate Change*, CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark

³² HLPE (2011) Land tenure and international investments in agriculture. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome

³³ See previous note.

³⁴ See note 32.

³⁵ See IFPRI website, Highlights from the IFPRI 2020 conference on Leveraging Agriculture for Improving Nutrition and Health, <http://www.ifpri.org/publication/highlights-2020-conference-leveraging-agriculture-improving-nutrition-and-health>

³⁶ P Pinstrup-Andersen, (2011) The food system and its interaction with human health and nutrition, IFPRI 2020 Conference Brief 13

5 GALVANISING POLITICAL COMMITMENT

¹ M de Onis, M Blossne and E Borghi, (2011) 'Prevalence of stunting among pre-school children 1990-2020', Growth Assessment and Surveillance Unit, *Public Health Nutrition*, 2011, Jul 14:1-7

² A Summer, J Lindstrom and L Haddad (2007) *Greater DFID and EC Leadership on Chronic Malnutrition: Opportunities and constraints*, Institute of Development Studies

³ J Bryce, D Coitinho, et al (2008) 'Maternal and child undernutrition: effective action at national level', *The Lancet*, 2008 Feb 9;371(9611):510-26

⁴ See Save the Children (2011) *No Child Out of Reach: Time to end the health worker crisis*

⁵ G Demombynes and J Kiringa, *The Drought and Food Crisis in the Horn of Africa: Impacts and proposed policy responses for Kenya*, Economic Premise, no 71, The World Bank

⁶ M Bunting, 'Brazil's cash transfer scheme is improving the lives of the poorest', *The Guardian*, 19 November, 2010

⁷ http://www.worldfoodprize.org/en/laureates/2011_laureates/

⁸ D Chmielewska and D D'Souza (2011) *The Food Policy Context in Brazil*, UNDP: International Policy Centre for Inclusive Growth

⁹ S S Moriss, B Cogill and R Uauy for the Maternal and Child Undernutrition Study Group (2008) 'Effective international action against undernutrition: Why has it proven so difficult and what can be done to accelerate progress?' *The Lancet* series on Maternal and Child undernutrition, article 5, 371, 608-21

¹⁰ R Levine and D Kuczynski, *Global Nutrition: is there an appetite for change?*, August 2009, Centre for Global Development, quoting Morris (see previous note)

¹¹ UN Standing Committee on Nutrition in its 6th Report on the World Nutrition Situation (2010) defines nutrition security as existing when “food security is combined with a sanitary environment, adequate health services, and proper care and feeding practices to ensure a healthy life for all household members”. The report published by FAO, WFP, WHO and UNICEF.

¹² World Food Security Summit 2009 Declaration Concept of Food Security: “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security.” http://www.fao.org/fileadmin/templates/wsfs/Summit/Docs/Final_Declaration/WSFS09_Declaration.pdf

¹³ Bangladesh, Ethiopia, Ghana, Laos PDR, Mali, Mauritania, Mozambique, Nepal, Niger, Sierra Leone, Tanzania and Uganda

¹⁴ For example, putting the internationally agreed Paris Principles for aid effectiveness into practice in relation to nutrition.

¹⁵ Bangladesh, Benin, Burkina Faso, Ethiopia, the Gambia, Ghana, Guatemala, Lao PDR, Malawi, Mali, Mauritania, Mozambique, Namibia, Nepal, Niger, Nigeria, Peru, Senegal, Tanzania, Uganda, Zambia and Zimbabwe. It is anticipated that other countries will follow.

¹⁶ See paragraph 4 of the CFS Reform Document – http://www.fao.org/fileadmin/templates/cfs/Docs0910/ReformDoc/CFS_2009_2_Rev_2_E_K7197.pdf

¹⁷ World Bank (2006) *Repositioning Nutrition as Central to Development: A strategy for large-scale action*, Washington DC. Although this is a large price tag, the benefits well outweigh the costs. Iron fortification would bring US\$4.8 billion in benefits (at an 8:1 benefit: cost ratio) and iodine fortification would yield US\$2.4 billion in benefits (at a 30:1 benefit: cost ratio). Those two interventions alone would cover the initial up-front investment..

¹⁸ Médecins Sans Frontières (2009) *Malnutrition: How much is being spent? An analysis of nutrition funding flows 2004–2007*

¹⁹ Lawrence Haddad, *Development Horizons*, 7 November 2011, <http://www.developmenthorizons.com/> referencing the OECD DAC Creditor Reporters System

²⁰ Save the Children (2009) *Hungry for Change: An eight-step, costed plan of action to tackle global child malnutrition*

Opposite: Munni, age one, with her mother, Afrozah, who is cooking *monga* – a porridge. After Save the Children identified Munni as malnourished, the family has been helped to plant a small vegetable garden and to find ways to increase their income.



A LIFE FREE FROM **HUNGER**

Tackling child malnutrition

The world has enough food for everyone, but millions of children face a life sentence of hunger and malnutrition – the hidden reason so many die.

Malnutrition is the underlying cause of 2.6 million children's deaths a year. And for millions more children, a lack of nutritious food stymies their physical and cognitive development. One child in three in developing countries is growing up stunted as a result of malnutrition.

Yet this crisis is not new. Progress on reducing malnutrition has been pitifully slow for 20 years. Now, a combination of global trends – climate change, volatile food prices, economic uncertainty and demographic shifts – is putting future progress at risk.

This report analyses the causes of malnutrition, focusing on chronic malnutrition and stunting in children. It identifies solutions that are proven to be effective:

- **Direct interventions**, such as exclusive breastfeeding, micronutrient supplementation and fortification
- Indirect interventions, such as introducing **social protection programmes**, and adapting **agricultural production** to meet the nutritional needs of children.

Crucially, this report then examines the **political factors** that contribute to the global burden of hunger and malnutrition.

Action must be taken now to prevent the crisis deteriorating and even more children suffering the life-long consequences. This report recommends how governments, multilateral agencies, business and individuals can play their part in tackling the problem – and help give every child a life free from hunger.

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