

THE POWER OF  
nutritio<sup>n</sup>

# INVESTMENT INDEX



**A REVIEW OF THE  
EVIDENCE-BASED  
INTERVENTIONS THAT  
GUIDE OUR WORK TO  
TRANSFORM CHILDREN'S  
FUTURES THROUGH  
IMPROVED NUTRITION.**

# INTRODUCTION

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The 11 evidence-based interventions included in The Power of Nutrition's Investment Index are some of the world's best existing tools to ensure that the next generation is protected from the lifelong consequences of undernutrition.

The Index, created by The Power of Nutrition, is based on the evidence presented in the 2008 Lancet Series on Maternal and Child Undernutrition and the 2013 Lancet Series on Maternal and Child Nutrition. This document aims to demystify these interventions and explain their potential impact for improving nutrition outcomes in a non-technical way for the benefit of the reader.

## THE NUTRITION INVESTMENT CASE

Good nutrition is foundational for economic and social development. The time to invest in nutrition is now – as a pathway towards ensuring that all children reach their full potential and as a strategy to achieve the world's Sustainable Development agenda by 2030.

In low- and lower-middle-income countries, the failure to provide children with the right nutrition during their first 1,000 days throws away the human potential of one third of a generation. This can have devastating effects on a country's economy – an estimated 11% of GDP is lost every year in Africa and Asia due to undernutrition.<sup>1</sup>

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## ABOUT US

The Power of Nutrition was launched in April 2015 to drive transformative nutrition outcomes for adolescent girls, women and children at scale. We aim to save lives and protect children from stunting and other forms of undernutrition by multiplying financing for nutrition and investing it in quality, high-impact programmes in hotspot geographies across sub-Saharan Africa and Asia. Our investments only finance interventions included in this Index, though each investment will not always finance the same, or every, intervention included. These interventions will be delivered through programmes run by our implementing partners on the ground.

It is only in partnership that we can achieve our vision. Visit [www.powerofnutrition.org](http://www.powerofnutrition.org) and follow @gofundnutrition on Twitter to learn more about the work we do and how you can join us on our journey.

# IMPROVING NUTRITION IS AN INVESTMENT THAT EVERYONE CAN AFFORD.



If you are an employer, as improvements in nutrition can strengthen the productivity of your labour force and the pool from which you draw your future workforce.



If you work for an international company, as improvements in nutrition can allow for higher purchasing power in developing countries and more sustainable markets.



If you are a development agency, as improvements in nutrition can increase the impact of your investments in other development sectors.



If you work in a Ministry of Education, as improvements in young children's nutrition can increase school attainment by at least one year.



If you work in a Ministry of Health, as improvements in nutrition can fortify the immune systems of your citizens and reduce infectious disease levels, reducing your costs in both the short- and long-term.



If you work in a Ministry of Finance, as improvements in nutrition can increase the country's earnings and reduce the long-term cost of undernutrition on a country's GDP.



If you are an individual beneficiary of nutrition programming, as you are more likely to achieve your full potential and contribute productively to your family, community and society.

# TABLE OF CONTENTS

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## **1 INTRODUCTION**

## **4 INTERVENTION TIMELINE**

## **6-16 INTERVENTIONS**

- 6 Iron and folic acid supplementation
- 7 Iron fortification of staple foods
- 8 Vitamin A supplementation
- 9 Salt iodisation
- 10 Multiple micronutrient supplements
- 11 Promotion of breastfeeding
- 12 Complementary feeding
- 13 Handwashing with soap
- 14 Management and prevention of acute malnutrition
- 15 Preventive zinc supplementation
- 16 Deworming

## **17 REFERENCES**

**MULTIPLY MONEY.  
MAXIMISE CHILDREN'S LIVES.  
THAT'S THE POWER OF NUTRITION.**

# THE POWER OF NUTRITION'S INTERVENTION TIMELINE

Approximate entry points for delivery of priority nutrition interventions to target beneficiaries.



— Interventions aimed at adolescent girls and women to improve maternal nutritional status

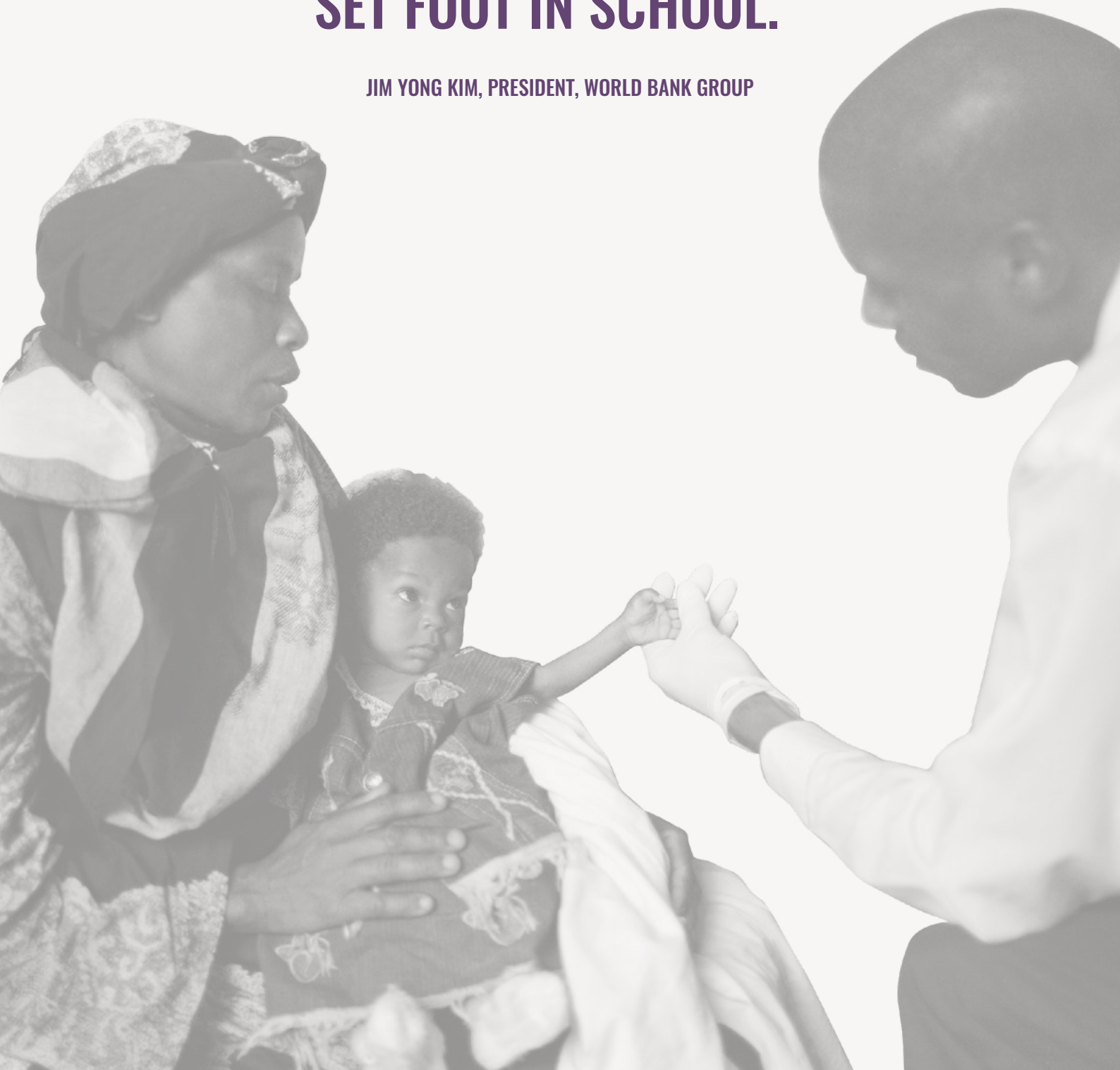
— Interventions to improve the nutritional status of children under five

— Universal interventions to improve the nutritional status of the entire target population

\* During the period between birth and six months of age, newborns should be exclusively breastfed, so these universal interventions are not directly targeted at this period of life.

**“WHEN CHILDREN DON’T  
HAVE THE RIGHT NUTRITION  
AND STIMULATION, THEY ARE  
DISADVANTAGED BEFORE THEY EVEN  
SET FOOT IN SCHOOL.”**

**JIM YONG KIM, PRESIDENT, WORLD BANK GROUP**



01

# IRON AND FOLIC ACID SUPPLEMENTATION

Iron and folic acid supplements help make pregnancy safer and increase women's productivity.

## WHAT IS IT?

Oral supplements that are delivered in tablet form and taken on a daily or weekly basis by women of reproductive age. They help prevent anaemia, a potentially life-threatening blood condition. They are particularly important for pregnant women.

Iron is also naturally found in:



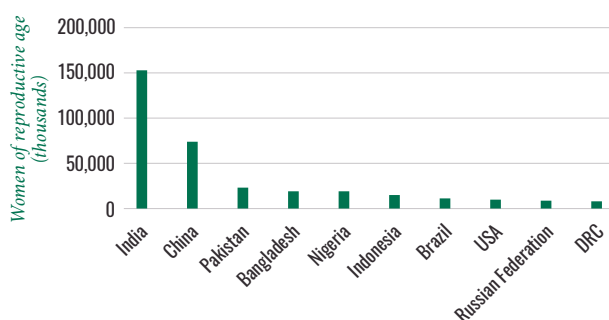
Folate, the naturally-occurring form of folic acid, is also found in:



## WHAT IS THE SCALE OF THE OPPORTUNITY?

Iron deficiency is the most common and widespread nutritional deficiency in the world, and is the cause of about half of all cases of anaemia.<sup>2</sup> Folic acid deficiencies are common in those eating a limited diet and represent another major cause of anaemia.<sup>3</sup>

FIGURE 1. COUNTRIES WITH THE LARGEST POPULATIONS OF WOMEN WITH REPRODUCTIVE AGE WITH ANAEMIA.



Source: Anaemia prevalence data from International Food Policy Research Institute, 'Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development', Washington, DC., 2015.

## WHAT IS THE EXPECTED IMPACT?

### *maternal anaemia*

Iron and folic acid supplementation are associated with significant decreases in risk of anaemia, which reduces the risk of maternal and neonatal mortality and illness.<sup>4,5</sup> Severe maternal anaemia increases the risk of maternal and neonatal mortality and illness.<sup>6</sup>

### *low birth weight and risk of mortality*

Iron and folic acid supplementation during pregnancy is associated with increased birth weight.<sup>7</sup> Low birth weight is credited as contributing to 60 to 80% of all newborn deaths.<sup>8</sup>

### *long-term outcomes in women*

Weekly iron and folic acid supplementation to all women of reproductive age improves future pregnancy outcomes and can also improve working capacity, learning ability and school performance.<sup>9</sup>

## HOW IS IT DELIVERED?

The World Health Organization recommends daily oral iron and folic acid supplementation for pregnant women as part of routine pregnancy care, and weekly supplementation for all women of reproductive age in areas where anaemia is highly prevalent.<sup>10</sup>

## HOW MUCH DOES IT COST?

UNICEF's Supply Catalogue lists the price of 100 daily iron and folic acid tablets as US\$0.76 – meaning that a year of supplementation would cost about US\$3 per woman.<sup>11</sup> Delivery costs vary depending on the geographic area and size of the programme.



## 02

# IRON FORTIFICATION OF STAPLE FOODS

Iron deficiency compromises cognitive development in young children, threatening their performance in school and work productivity in adulthood.

## WHAT IS IT?

Mass iron fortification programmes usually involve the fortification of wheat or maize flours. Other food items that can be fortified with iron include cereal-based complementary foods (for children 6-24 months of age), fish sauce, soy sauce, milk and rice.<sup>12</sup>

Iron is also naturally found in:



RED MEAT



SOME  
SEAFOOD



BEANS



DARK GREEN LEAFY  
VEGETABLES

Fortification of foods is a tested and proven approach to addressing micronutrient deficiencies. The United States and countries in Europe have used food fortification since the 1920, and it is feasible for children and adults to consume their entire daily requirements of iron through fortified foods such as cereals.

## WHAT IS THE SCALE OF THE OPPORTUNITY?

See previous section on iron and folic acid supplementation.

## HOW IS IT DELIVERED?

Fortification strategies depend on the specific food product being fortified, but are usually part of an effort to reach whole populations in a certain geographic area. Targeted iron fortification programmes also exist. An example is cereal-based complementary foods that have been fortified with iron, which would be targeted to young children over six months of age after exclusive breastfeeding.



## WHAT IS THE EXPECTED IMPACT?

### *Reduced iron deficiency anaemia*

Iron deficiency and anaemia are linked to a range of longer-term outcomes, including low birth weight, maternal and neonatal mortality, and poor cognitive development in children.<sup>13</sup>

Iron fortification of foods  
has been shown to reduce  
the risk of anaemia by

**40%**

and the risk of iron  
deficiency by

**50%**<sup>14</sup>

## HOW MUCH DOES IT COST?

Costs of fortification initiatives depend on a number of variables, including the food product being fortified, the scale of the programme and the type of iron used in the fortification process.

The Copenhagen Consensus – a group of world-renowned economists – has calculated that the annual cost of scaling up flour iron fortification to reach 50% of the population of South Asia and sub-Saharan Africa would be US\$0.12 per person, or US\$167 million in total – resulting in benefits per year worth US\$1,336 million.<sup>15</sup>

## 03 VITAMIN A SUPPLEMENTATION

Vitamin A is best known for safeguarding eyesight – and is also critical for the development and healthy functioning of a child's immune system.

### WHAT IS IT?

Vitamin A is provided through supplements, in the form of a small capsule or a syrup solution administered orally.<sup>16</sup>

Vitamin A is also naturally found in:



In 2008, the Copenhagen Consensus ranked vitamin A supplementation along with zinc supplementation as the top development priority out of more than 40 interventions considered.<sup>17</sup>

### WHAT IS THE SCALE OF THE OPPORTUNITY?

Vitamin A deficiency affects nearly one third of children 6-59 months old in low- and middle-income countries.<sup>18</sup> The prevalence of vitamin A deficiency is highest in sub-Saharan Africa and South Asia.

### WHAT IS THE EXPECTED IMPACT?

#### *vulnerability to illness*

A child who receives vitamin A supplementation has a 15% lower chance of developing diarrhoea and a 50% lower chance of developing measles.<sup>19</sup>

#### *risk of mortality*

Research shows that vitamin A supplementation is associated with a 24% lower risk of dying before their 5th birthday.<sup>20</sup>

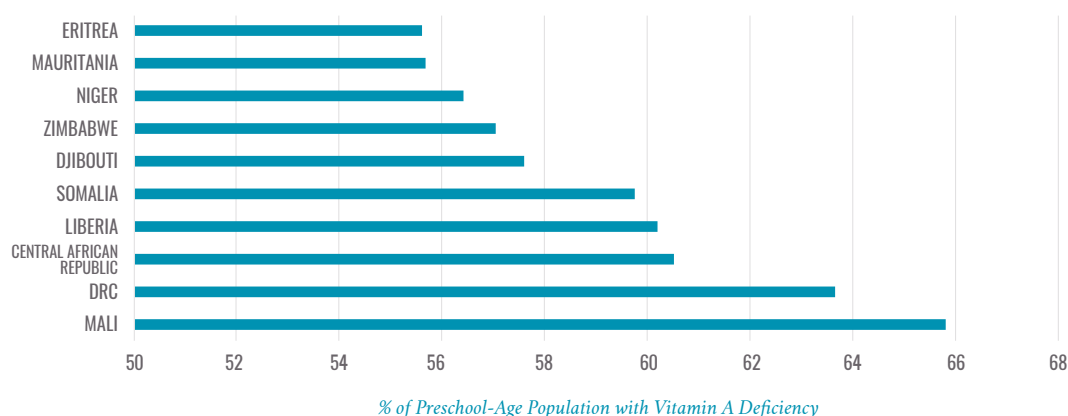
### HOW IS IT DELIVERED?

The World Health Organization recommends that vitamin A supplements be provided every four to six months to children between the ages of 6 months and 5 years.<sup>21</sup> These supplements are often delivered through mass campaigns (e.g., Child Health Days) or through school-based programmes, and can be easily bundled with deworming treatments.

### HOW MUCH DOES IT COST?

Most of the vitamin A used during supplementation campaigns is supplied in capsules that cost approximately US\$0.02 each, with an estimated cost of US\$1–2 for delivery per child per year.<sup>22</sup>

FIGURE 2. COUNTRIES WITH THE HIGHEST PREVALENCE OF VITAMIN A DEFICIENCY IN YOUNG CHILDREN



Source: International Food Policy Research Institute, 'Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development', Washington, DC., 2015.

## 04

SALT  
IODISATION

“Iodine deficiency is the world’s most prevalent, yet easily preventable, cause of brain damage.”<sup>23</sup>

WORLD HEALTH ORGANIZATION

## WHAT IS IT?

Salt used in households and in food processing can be fortified with iodine – an essential micronutrient for normal thyroid hormone activity, which helps the body to grow and develop normally. Because of this, safeguarding against iodine deficiency is especially important during pregnancy and infancy.

The approach of iodising salt has been used for decades in many developed countries, and more than 70 countries have salt iodisation programmes.<sup>24</sup> Salt iodisation is one of the most cost-effective and safest way to ensure that entire populations can access adequate levels of iodine on a regular basis.

Iodine is also naturally found in:



FISH



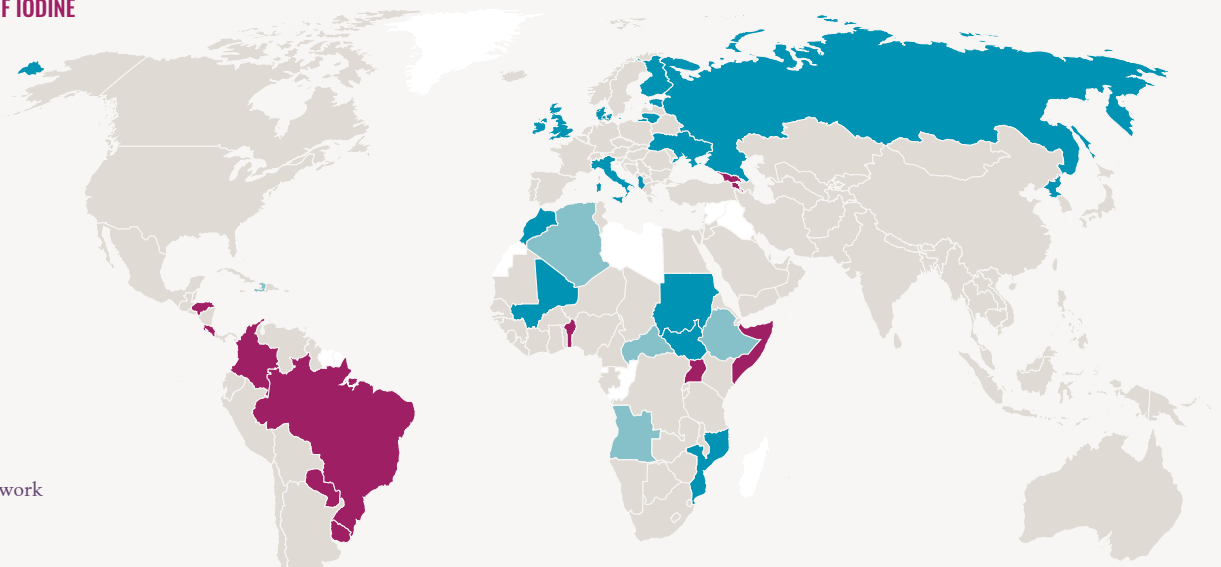
DAIRY  
PRODUCTS

## WHAT IS THE SCALE OF THE OPPORTUNITY?

The World Health Organization estimates that approximately nearly 2 billion individuals worldwide – including 37% of all school-age children – are not getting adequate levels of iodine through their regular diets.<sup>25</sup>

FIGURE 3. GLOBAL MAP OF IODINE DEFICIENCY, 2014-2015

- Moderate
- Mild
- Adequate
- Excess
- No data



Source: Iodine Global Network

## HOW IS IT DELIVERED?

Universal salt iodisation is recommended in all populations at risk of iodine deficiency. During pregnancy, iodine requirements increase significantly. In countries where less than 20% of households have access to iodised salt, the World Health Organization recommends iodine supplementation for pregnant and lactating women.<sup>26</sup>

## WHAT IS THE EXPECTED IMPACT?

*improved iodine status*

A recent review found that many of the effects of iodine deficiency were mitigated by salt iodisation: children provided with iodised salt while in the womb and during infancy and early childhood had an average IQ score of more than 13 points higher than unexposed children. These children were also less likely to suffer from cretinism – a condition of severely stunted mental and physical growth caused by maternal thyroid abnormalities linked to iodine deficiency.<sup>27</sup>

## HOW MUCH DOES IT COST?

In nearly all regions affected by iodine deficiency, use of iodised salt is the most cost-effective way to avert iodine deficiency.<sup>28</sup> The World Health Organization lists the cost of salt iodisation as “extremely low – only about US\$0.05 per person per year.”<sup>29</sup>

# MULTIPLE MICRONUTRIENT SUPPLEMENTS

Providing children with multiple micronutrients at the same time is an easy and cost-effective way to ensure that they grow up protected from some of the most common nutritional deficiencies.

## WHAT IS IT?

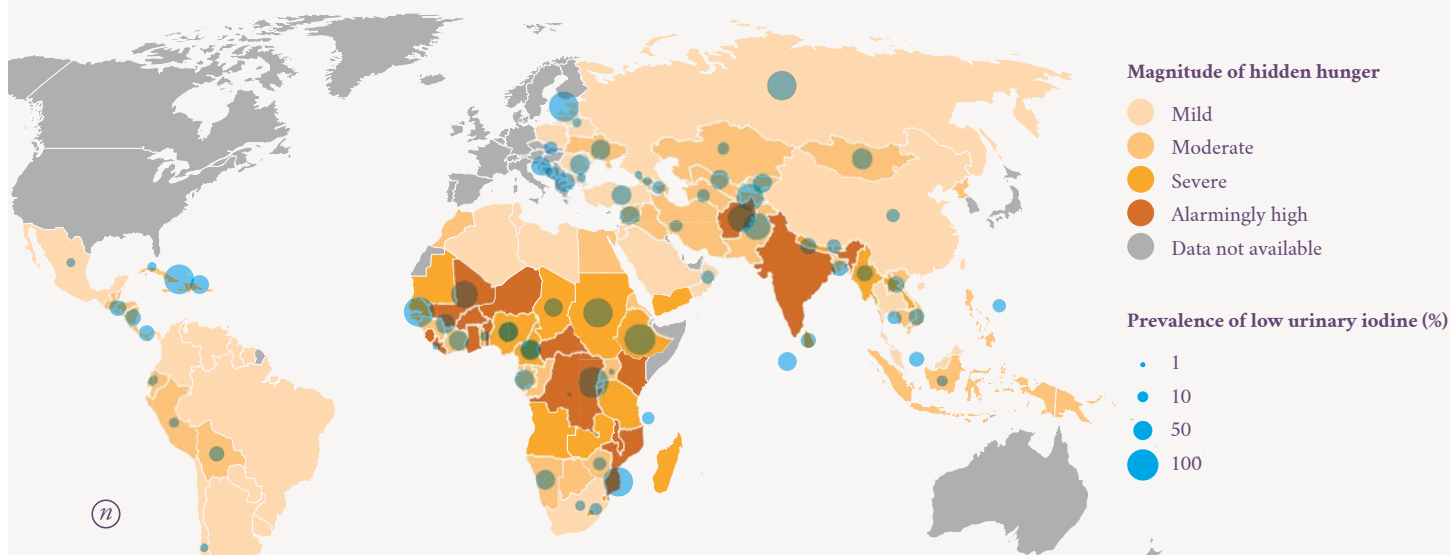
Multiple micronutrient powders, also referred to as micronutrient Sprinkles, are tasteless powders that contain daily doses of a blend of micronutrients (containing at least iron, vitamin A and zinc) needed for proper growth and development. Usually contained in a sachet or small packet, these powders can be used regularly at home and in schools, and should be sprinkled onto foods just before consumption.

## WHAT IS THE SCALE OF THE OPPORTUNITY?

Micronutrient deficiencies are common. Globally, an estimated 2 billion people are affected by micronutrient deficiencies. Pregnant women and children under 5 face the greatest risk.<sup>30</sup>

**FIGURE 4. A MAP OF GLOBAL HIDDEN HUNGER BASED ON NATIONAL PREVALENCE OF STUNTING AND DEFICIENCIES IN IRON, VITAMIN A AND IODINE IN PRE-SCHOOL CHILDREN.**

Source: Muthayya, Sumithra et al., 'The Global Hidden Hunger Indices and Maps: An Advocacy Tool for Action', PLoS One, vol. 8 issue 6, 12 June 2013.



## WHAT IS THE EXPECTED IMPACT?

### *iron deficiency and anaemia*

The World Health Organization recommends multiple micronutrient powders as a way to prevent childhood anaemia, which can impair cognitive and physical development and decrease work productivity in adulthood.<sup>31</sup>

### *risk of stunting*

The use of micronutrient powders containing iron, vitamin A and zinc were found to have a small but statistically significant effect on child growth.<sup>32</sup>

## HOW IS IT DELIVERED?

In areas with high prevalence of anaemia, the World Health Organization recommends one sachet of multiple micronutrient powder per day for a period of 2 months.<sup>33</sup> The powders should be introduced around 6 months of age, at the same time as complementary foods are introduced. These sachets can be delivered to households for home use, or to schools for addition to daily school meals.

## HOW MUCH DOES IT COST?

UNICEF's Supply Catalogue lists the price of a multiple micronutrient powder sachet around US\$0.02 each.<sup>34</sup> Thus, the commodity cost of a two-month course of multiple micronutrient powders would be less than US\$1.50 per child. Delivery costs vary depending on the geographic area and size of the programme, and commodity costs can also vary if custom formulations are developed.

# PROMOTION OF BREASTFEEDING

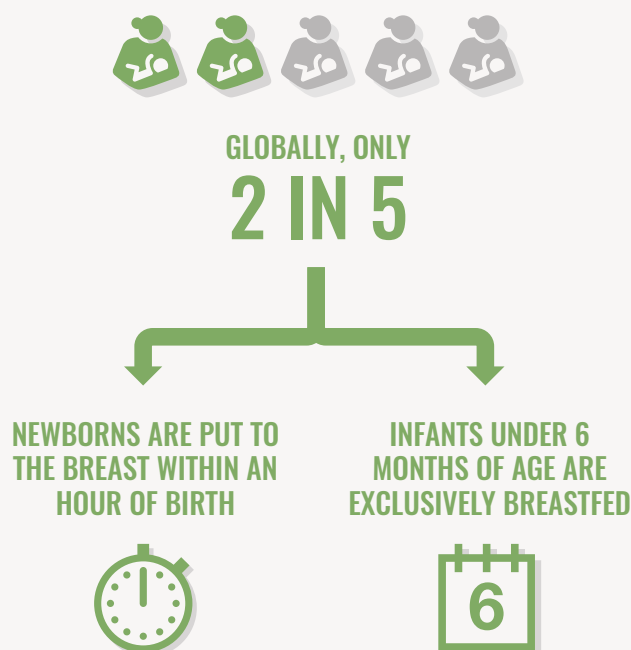
Universal breastfeeding could prevent the deaths of 823,000 children and 20,000 mothers each year – saving the global economy up to US\$300 billion.

THE LANCET, 2016<sup>35</sup>

## WHAT IS IT?

Early and exclusive breastfeeding provides babies with the essential components of their nutrition in the first six months, as well as substances that boost the baby's immune system. Early breastfeeding is especially important because the first feeds contain colostrum, a special milk often referred to as "liquid gold" because of its immune properties. This colostrum serves as the baby's first "immunisation," is rich in vitamin A and helps to ensure that the baby's intestine and body grow and develop properly.<sup>36</sup>

## WHAT IS THE SCALE OF THE OPPORTUNITY?



Source: UNICEF, 'Committing to Child Survival: A Promise Renewed: Progress Report 2015', September 2015.

## WHAT IS THE EXPECTED IMPACT?

### *infections*

About half of all diarrhoea episodes and a third of respiratory infections (e.g., pneumonia) would be avoided by appropriate breastfeeding.<sup>37</sup>

### *mortality*

Early breastfeeding – within the first hour of birth – can reduce the risk of a baby dying within their first month of life by 44%.<sup>38</sup>

A recent review found that infants who were not breastfed had a 14 times higher risk of death compared to infants 0-5 months who were exclusively breastfed.<sup>39</sup>

### *better education and income*

In Brazil, a study of over 3,000 individuals in Brazil found that infants who were breastfed longer than 12 months achieved an additional year of education and incomes about a third higher than those with less than 1 month of breastfeeding.<sup>40</sup>

## HOW IS IT DELIVERED?

All babies should be breastfed early – within the first hour after birth – and exclusively – for the first 6 months of life, with no other food or water. Once complementary foods are introduced after 6 months, babies should still continue to be breastfed until 2 years of age.

Educating women about the benefits of breastfeeding can be done at health facilities or through direct community engagement, using community health workers or women's groups.

## HOW MUCH DOES IT COST?

The cost of scaling up interventions to promote and support breastfeeding are hard to estimate on a large scale. Some relatively low-cost interventions that can help to increase exclusive breastfeeding rates include the provision of lactation rooms in the workplace and nursing breaks for working mothers.



## 07

# COMPLEMENTARY FEEDING

Complementary foods should be included alongside breastfeeding in a child's diet after the age of six months – an important growth period during which they are more vulnerable to undernutrition.

## WHAT IS IT?

Complementary foods depend on the geography, but should be rich in micronutrients, calories and protein, easy for the child to eat and liked by the child. Meals containing complementary foods should be provided from a range of food groups and at the right frequency as the child weans off of breastmilk.

**TABLE 1. AN OVERVIEW OF COMMON COMPLEMENTARY FOOD GROUPS AND THE TYPICAL VALUE THAT THEY CAN ADD TO A CHILD'S DIET<sup>41</sup>**

FOOD GROUP	NUTRITIONAL VALUE
Animal-source foods or fish	Protein, iron and zinc
Dairy products	Calcium, protein, B vitamins
Beans, lentils, peanuts and other pulses	Protein, sometimes iron
Orange-coloured fruits and vegetables	Vitamin A precursors and Vitamin C
Fats and oils	Calories and essential fatty acids
Staple foods such as cereals and roots	Calories and carbohydrates

In settings where a wide variety of acceptable complementary foods are not locally available or affordable, complementary food products can be used. These include fortified blended foods (usually cooked as porridge), micronutrient powders or complementary food supplements.

## WHAT IS THE SCALE OF THE OPPORTUNITY?

Globally, most children are not receiving adequate complementary foods each day.

**29%** Children 6-23 months who receive food from four or more groups per day.<sup>42</sup>

**14%** Children who receive a “minimum acceptable diet” (based on breastfeeding status, dietary diversity and meal frequency).<sup>43</sup>

Source: Based on median rates for both indicators from International Food Policy Research Institute, 'Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development', Washington, DC., 2015.



## WHAT IS THE EXPECTED IMPACT?

### *stunting*

In low-income countries, dietary diversity and optimal complementary feeding practices have been positively associated with increased height and a lower risk of stunting.<sup>44</sup>

## HOW IS IT DELIVERED?

Interventions to improve complementary feeding are focused on children ages 6-24 months, when children are at the highest risk of stunting and when breastmilk no longer provides all needed nutrients for a child's development.<sup>45</sup>

If complementary foods are available and affordable, then complementary feeding behaviours and practices of caregivers can be improved through education. Caregivers can be counselled about complementary feeding practices through local health workers and educational programmes targeting individuals or small groups of mothers. Mass media can also be used to change social norms that might be preventing optimal complementary feeding and achieve large-scale changes in mothers' knowledge, attitudes and practices. In some settings, complementary food products may be provided as part of an education or counselling programme, as an incentive to boost attendance or as a direct intervention for children identified as undernourished during the course of the programme.

## HOW MUCH DOES IT COST?

Costs of complementary feeding interventions can vary considerably, as programmes need to be highly context-specific and address the needs of the target population while also considering the availability of local complementary foods.

# HANDWASHING WITH SOAP

Handwashing with soap – one of the most cost-effective interventions in public health – leads to healthier children whose bodies are strong enough to absorb the nutrients they need to grow.

## WHAT IS IT?

Handwashing with soap is an important component of water, sanitation and hygiene (WASH) programmes that helps to prevent and control the spread of infectious diseases. Access to clean water, hygiene and sanitation is key to keeping children healthy and safe from common childhood diseases such as diarrhoea. Diarrhoeal infection can adversely affect a child's nutritional status by reducing her ability to eat and absorb nutritious food. Furthermore, undernutrition can predispose a child to diarrhoeal infection by weakening her immune system.

## WHAT IS THE SCALE OF THE OPPORTUNITY?

A recent review found that only about 19% of the world population washes their hands with soap after using sanitation facilities or coming into contact with children's excreta.<sup>46</sup> There remains much more work to be done to change people's behaviours, and to teach children about the importance of hand washing.

## HOW IS IT DELIVERED?

Handwashing with soap should be practiced universally. Programmes focused on changing the behaviours of caregivers and their children can help ensure that those children are protected from disease – and can also set the stage for lifelong hygienic habits.



## WHAT IS THE EXPECTED IMPACT?

### *risk of infectious disease*

Hand washing with soap can reduce the risk of diarrhoea by about half.<sup>47</sup> Reductions in diarrhoea can help children to better absorb the nutrients in their diet and may improve the impact of nutritional interventions.

A study in Pakistan found that children under five who practiced handwashing with soap were half as likely to develop pneumonia.<sup>48</sup>

### *risk of stunting*

Due to the prevention of infectious diseases, handwashing with soap and other WASH interventions may slightly improve height in children under five years of age.<sup>49</sup>

## HOW MUCH DOES IT COST?

Handwashing with soap is commonly known as one of the most cost-effective interventions in public health. Evidence from a study promoting handwashing with soap in Burkina Faso found that, for each household that started washing their hands with soap, the cost was only US\$7.3 per year – about 1% of annual household income.<sup>50</sup> However, the study also found that hand washing with soap resulted in household savings of US\$2.80 per year, as the intervention directly reduced costs of medical care for diarrhoea treatment and resulted in increased household productivity through averting premature child deaths due to diarrhoea.

## 09




# MANAGEMENT AND PREVENTION OF ACUTE MALNUTRITION

Treatment for severe acute malnutrition can be life-saving – but an estimated 90% of suffering children are not receiving the treatment they need.

## WHAT IS IT?

A child can develop acute malnutrition if she experiences a period of rapid weight loss due to a diet that does not cover her nutritional needs. This is commonly known as wasting.

Moderate acute malnutrition (MAM) can be prevented and treated through the distribution of food supplements, which may also prevent a child's descent into severe acute malnutrition (SAM). SAM is a medical diagnosis that requires subsequent treatment and medical care in hospitals or at home. A child is diagnosed with SAM if they:

-  **1** Weigh significantly less than other children their height (known as wasting);
-  **2** Have a very thin arm circumference (below the SAM threshold); and/or
-  **3** Suffer from visual symptoms of severe undernutrition (such as a swelling of the feet or legs, known as oedema).

Once a child is severely acutely malnourished, they must be treated with therapeutic foods (also known as ready-to-use-therapeutic foods, or RUTF) for a period of six to eight weeks.<sup>51</sup> RUTF is a vitamin- and mineral-fortified high-protein, calorie-rich food product.

## WHAT IS THE SCALE OF THE OPPORTUNITY?

An estimated 20 million children suffer from SAM, but only about 10 to 15% receive the necessary treatment.<sup>52</sup>

## HOW IS IT DELIVERED?

Supplementary and therapeutic foods for acute malnutrition can be given to children under 5 after exclusive breastfeeding. Supplementary foods to treat MAM and prevent SAM can be provided at community-level, typically for for 3-6 months. Treatment for SAM usually lasts 6-8 weeks, and can usually be delivered to children at the community-level. However, around 15% of all SAM cases will need initial facility-based care if there are complications or other danger signs.<sup>53</sup>

## WHAT IS THE EXPECTED IMPACT?

### mortality reduction

Evidence shows that the mortality rate of children with SAM is 30% to 50% – but treatment can reduce the risk of death during a SAM episode to as low as 5%.<sup>54,55</sup>

A severely wasted child is...

**10X** More likely to die from respiratory tract infections, like pneumonia

**12X** More likely to die from diarrhea

**10X** More likely to die from measles

...than an adequately nourished child.<sup>56</sup>

## HOW MUCH DOES IT COST?

The cost of community-based SAM treatment can vary widely depending on the geographic area. Supplementary food formulations can also vary, but the commodity can cost about US\$0.30 per day per child.<sup>57</sup>

**TABLE 2. ESTIMATES OF COST PER CHILD CURED THROUGH COMMUNITY-BASED MANAGEMENT OF SAM, BASED ON THE EXISTING LITERATURE.**

COUNTRY	YEAR	COST PER CHILD CURED
Ethiopia	2007	\$135
Malawi	2011	\$169
Bangladesh	2013	\$180
Zambia	2009	\$203
Indonesia	2012	\$332
Ghana	2014	\$805

Adapted from Frankel, Sasha, et al., 'Costs, Cost-Effectiveness, and Financial Sustainability of Community-based Management of Acute Malnutrition in Northern Nigeria', Results for Development Institute, June 2015.



## 10 PREVENTIVE ZINC SUPPLEMENTATION

Zinc deficiency is an underlying cause of about 800,000 child deaths each year, most of which are due to pneumonia, diarrhoea and malaria.<sup>58</sup>

### WHAT IS IT?

Zinc helps to build up the body's protective barriers to infection and is important for normal growth and development of children.<sup>59</sup>

Zinc is also naturally found in:



MEAT



SHELLFISH



BEANS



CERTAIN NUTS

### WHAT IS THE EXPECTED IMPACT?

#### *reduced risk of infectious disease*

In children under five, supplementation with zinc is associated with a 13% reduced risk of developing diarrhoea and a 19% reduced risk of developing pneumonia.<sup>61</sup>

#### *growth outcomes*

Analysis of zinc supplementation in developing countries showed significant improvements in height in children after 24 weeks of supplementation.<sup>62</sup>

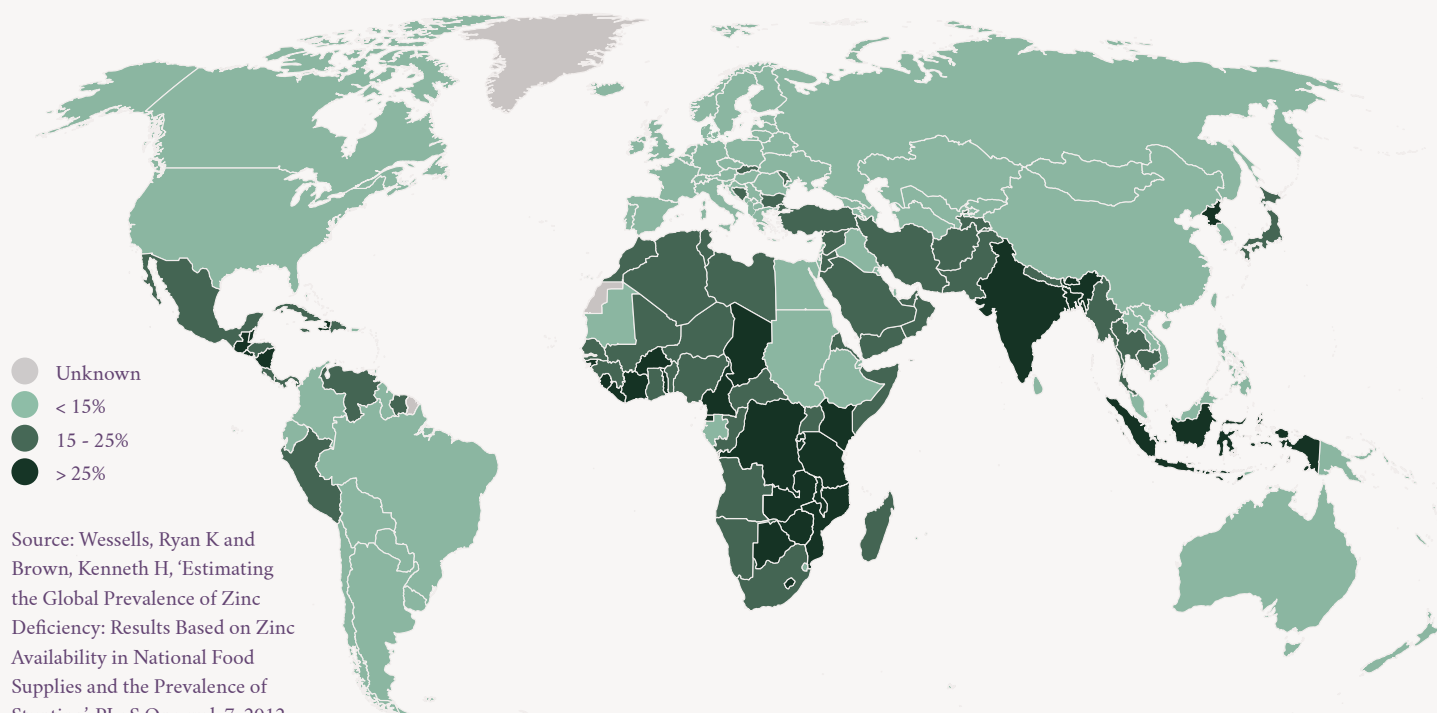
### HOW IS IT DELIVERED?

Clinical trials continue to test the delivery and optimal dosages of zinc supplements in children under five.

### WHAT IS THE SCALE OF THE OPPORTUNITY?

An estimated 17% of the global population is at risk of inadequate zinc intake.<sup>60</sup>

**FIGURE 5. ESTIMATED COUNTRY-SPECIFIC PREVALENCE OF INADEQUATE ZINC INTAKE, BASED ON AVAILABLE ZINC IN THE FOOD SUPPLY, ABSORPTION RATES, AND ESTIMATED ZINC NEED BY POPULATION.**



## 11

## DEWORMING

Parasitic worm infections can result in internal bleeding that leads to iron deficiency and anaemia, loss of appetite and diarrhoea – all of which can reduce a child's cognitive development, health and ability to absorb nutrients.<sup>64</sup>

### WHAT IS IT?

Deworming medications are used to treat infections caused by helminths, a group of parasites commonly referred to as worms. Deworming medications can be given in the form of a tablet in children, and are provided either once or twice a year in areas with high risk of infection.<sup>65</sup>

### WHAT IS THE SCALE OF THE OPPORTUNITY?

The World Health Organisation estimates that more than 880 million children are in need of deworming treatment.<sup>66</sup>



### WHAT IS THE EXPECTED IMPACT?

#### *weight gain*

Children with intestinal infections may experience a weight gain of about half a kilogram after one dose of deworming drugs.<sup>67</sup>

#### *increased protection against anaemia*

Deworming drugs given during a child's infection can increase her levels of haemoglobin – an indicator used in the diagnosis of anaemia.<sup>68</sup>

### HOW IS IT DELIVERED?

The World Health Organization recommends one to two yearly mass deworming campaigns to all preschool- and school-aged children and women of reproductive age living in high-risk areas.<sup>69</sup> Deworming campaigns for children are often delivered alongside vitamin A supplementation programmes, as these usually only occur twice a year and aim to reach the nearly same target population of children.

### HOW MUCH DOES IT COST?

The Copenhagen Consensus has determined deworming to be a safe and inexpensive intervention. The cost of delivering one round of treatment is estimated at about US\$0.15 per child through school delivery programmes.<sup>70</sup>

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# IMAGE CREDITS

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30 Bedford Street, London, WC2E 9ED  
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[info@powerofnutrition.org](mailto:info@powerofnutrition.org)

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