



# FROM THE FIRST HOUR OF LIFE

Making the case for improved  
infant and young child feeding  
everywhere

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unite for children

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# LIST OF ABBREVIATIONS

ART	Antiretroviral Therapy
BFHI	Baby-friendly Hospital Initiative
CEE/CIS	Central and Eastern Europe and the Commonwealth of Independent States
DHS	Demographic and Health Survey
HIV	Human Immunodeficiency Virus
ILO	International Labor Organization
IQ	Intelligence Quotient
MICS	Multiple Indicator Cluster Survey
MNPs	Micronutrient Powders
SDG	Sustainable Development Goals
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
WHO	World Health Organization

# FOREWORD

The drive to eat and to find the best food for our young is a primal instinct. Mothers and fathers around the world try their best to provide nourishing food for their children with the knowledge and resources available to them. This is not always an easy task – and, more often than not, it is an incredibly challenging one.

Some families find themselves in emergencies where the usual food sources are scarce, and disaster or conflict forces them to flee their homes. In many more cases, the challenges are mundane, every-day struggles. It could be a young mother who cannot continue to exclusively breastfeed because she must return to a 10-hour-a-day factory job when her newborn is only a few days old. Or it might be a young child who eats rice porridge or root vegetables for most of his meals because protein-rich foods, needed for healthy growth and development, are not locally available or affordable to his family.

These families are not alone in their struggles. Similar stories can be found in almost every country in the world – and they have devastating consequences for children. Acute malnutrition, or wasting, threatens the lives of 50 million children around the world, and 156 million children suffer from chronic malnutrition or stunting.<sup>1</sup> Stunted children are not just shorter than they might have been; their brains

are also robbed of the ability to develop to their full potential. This means that these children are more likely to fall behind in school and earn less as adults, and that they will face lifelong barriers to participating fully in their societies. We have come a long way in reducing chronic malnutrition: there are 42 million fewer stunted children in the world than there were 15 years ago.<sup>1</sup> But the sheer numbers that remain should shock us all into further action.

To start, we need to know more about how children are being fed across all regions and how these feeding practices match up to the recommended guidelines on infant and young child feeding. This global report, *'From the First Hour of Life: Making the case for improved infant and young child feeding everywhere'*, aims to do just that, by providing a global mapping of indicators on infant and young child feeding practices. These indicators tell a story about how children are being fed, what obstacles stand in their way, and where and how we can urgently do better.

We have our work cut out for us. Despite the ever-growing body of evidence that breastfeeding saves lives, the report reveals that fewer than half of all newborns are put to the breast within the first hour of life, and only two out of five infants are exclusively breastfed for the first 6 months of life. In low- and middle-income countries, only one in six

children receives enough of the right foods to ensure that they grow and develop to their full potential. With better understanding of the barriers blocking progress, governments, supported by UNICEF and partners, will be better placed to target programming to help those most in need, wherever they are.

To truly change this story, we need greater recognition that good nutrition in the earliest days of life matters deeply. We already know that it matters to families, who are struggling to put food in the mouths of their babies. But too often we think of feeding children as a private matter within families, and the sole responsibility of mothers and fathers. In reality, ensuring that children get the food they need requires the commitment of communities, societies and nations. This report calls for an acceptance that good nutrition in the earliest years is a collective responsibility, and commitments and investments from governments are needed to make it a reality for all children.



Ted Chaiban  
Director of Programmes

# EXECUTIVE SUMMARY: FOCUS ON BREASTFEEDING

Breastfeeding is not a one-woman job. Women who choose to breastfeed need support from their governments, health systems, workplaces, communities and families to make it work.

While the evidence on the power of breastfeeding for lifelong health and prosperity is stronger than ever, there is much work to be done in improving breastfeeding practices worldwide. Part I of this global report, *From the First Hour of Life: Making the case for improved infant and young child feeding everywhere*, paints a troubling picture about the state of breastfeeding practices around the world.

This report reviews the most recent evidence on breastfeeding and provides updated global and regional estimates on early initiation of breastfeeding, exclusive breastfeeding and continued breastfeeding. The report concludes with recommendations to guide policy and programme action on breastfeeding at the national level.

**The first hour of life:** The early initiation of breastfeeding – putting newborns to the breast within the first hour of life – safeguards infants from dying during the most vulnerable time in their lives. However, less than half of all newborns are put to the breast within an hour of birth. That leaves 77 million newborns waiting too long for this first critical contact with their mother outside of the womb. Progress to

improve early initiation rates has been slow over the past 15 years, with global rates increasing by just 14 percentage points overall.

In a subset of countries studied, nearly two out of five breastfed newborns were found to receive foods or liquids other than breastmilk in the earliest days of life. This is concerning because feeding newborns anything other than breastmilk has the potential to delay initiation of breastfeeding – and the evidence is clear that the longer the delay, the greater the risk of death.

Globally, the majority of births are now delivered with the help of a skilled attendant. Despite the potential of skilled birth attendants to support mothers in initiating breastfeeding immediately after birth, in most regions studied, early initiation was not facilitated by the presence of a doctor, nurse or midwife.

**From birth to six months:** Exclusive breastfeeding – feeding infants only breastmilk for the first six months of life – is the safest and healthiest option for children everywhere. Yet in every region of the world, rates of exclusive breastfeeding decline steadily from birth to 5 months of age.

Globally, just over 40 per cent – or two out of five – of the world's infants under 6 months of age are exclusively breastfed, and there has

been little progress over the past 15 years. Five out of seven regions with trend data have current rates around 30 per cent, and all of them have improved very little, if at all, in more than a decade.

## **From 6 months to age 2 and beyond:**

Continued breastfeeding – which covers breastfeeding during the period between 6 months and 2 years of age or beyond – improves cognitive ability, translating into improved school performance, better long-term earnings and enhanced productivity. Globally, less than half of all children are still being breastfed at 2 years, and this rate has remained relatively unchanged since 2000. Continued breastfeeding rates drop from 74 per cent at 1 year to 46 per cent at 2 years. In nearly all regions, continued breastfeeding rates are highest among women from the poorest households.

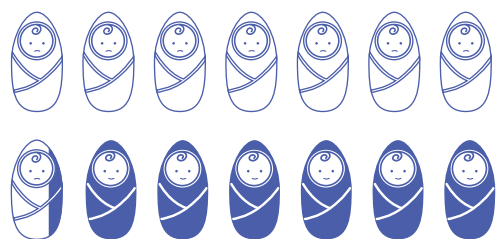
Government leadership is needed to adopt national policies and scale-up national programmes that reflect the collective responsibility to protect, promote and support breastfeeding.

We must recognize that building breastfeeding-friendly policies, programmes, health systems, workplaces and communities is everyone's responsibility. If we do so we can create a better world for future generations.



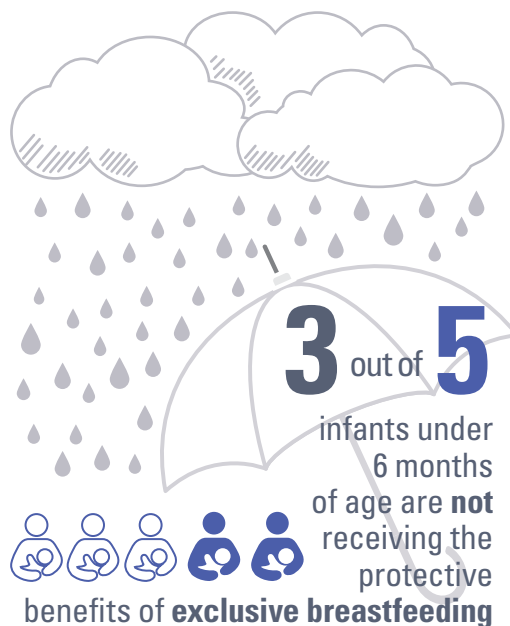
Too few children benefit from appropriate breastfeeding practices.

Of the 140 million live births in 2015,  
**77 million**  
 newborns had to wait **too long** to be  
 put to the breast.

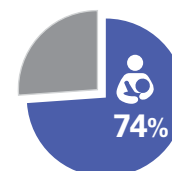


Only 45 per cent of newborns were put to the breast within the first hour of life.

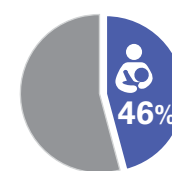
= 10 million newborns



Breastfeeding rates  
**decrease** by about  
**one third** between  
 12 and 23 months.



12-15  
 months



20-23  
 months

The per cent of children breastfed at 1 year (12-15 months) and 2 years (20-23 months), 2015

**We must change the story and make sure that all women who choose to breastfeed have the support they need from their governments, health systems, workplaces, communities and families.**

# EXECUTIVE SUMMARY: FOCUS ON COMPLEMENTARY FEEDING

Families do their best with the resources they have to provide nutritious meals for their children – but they cannot do it alone. Government leadership and contributions from all sectors of society are needed to provide children with healthy diets.

Part II of this global report reveals a world where healthy diets are out of reach for the majority. The report reviews the most recent evidence on complementary feeding practices and provides updated global and regional estimates on key indicators, including the introduction of solid, semi-solid and soft foods, minimum meal frequency, minimum dietary diversity and minimum acceptable diet, while highlighting which children do not get the nutrition they need. The report concludes with recommendations to guide policy and programme actions on complementary feeding at the national level.

**Starting out right:** The timing of children's first bites of food is critical to their growth and development. Solid, semi-solid and soft foods need to be introduced to infants' diet at 6 months of age to keep up with children's growing nutrition needs. Children who are introduced to solid foods too late face a greater risk of undernutrition. Yet globally, about one third of infants 6–8 months old are not eating solid foods. Additionally, there are children who are fed solid foods too early – even as early as

1–3 months of age – putting them at risk of early cessation of breastfeeding and infection.

**Every bite counts:** The nutritional needs for children 6–23 months of age are greater per kilogram of body weight than at any other time in life. However, half of the world's children are not fed enough times per day to meet the minimum recommendations.

**Full bellies are not enough:** Food must come from a diverse range of food groups to ensure that children receive all the vitamins, minerals and nutrients they need to grow, develop, stay healthy and reach their full potential. Despite the importance of dietary diversity, a shocking two thirds of the world's children are not eating the recommended minimum number of food groups, putting them at risk of undernutrition and poor development.

The youngest children are most susceptible to the consequences of poor dietary diversity given that their growing brains and bodies need good nutrition the most. However, infants 6–11 months old were found to have the lowest rates for minimum diet diversity of all age groups studied. What's more, a very low proportion of these infants are eating any nutrient-dense animal source foods which are rich in iron, important for the prevention of anaemia, and other essential nutrients.

## **Beyond just when and what children eat:**

Globally, only one in six children is benefiting from both a minimally frequent and diverse diet – referred to as a minimum acceptable diet. In addition to frequency and diversity of feeding, the evidence is clear that the caregiver's role in feeding can be as important as the food itself. Caregivers should interact with the child, respond to their hunger signals and select appropriate foods. Safe food preparation, storage and hygienic practices are also crucial to preventing the spread of disease and ensuring that good nutrition reaches and remains in children's bodies.

Too often, feeding children is considered a private matter within families, and the sole responsibility of mothers and fathers. However, children's diets are a shared responsibility: no single household can do it alone. Government leadership and contributions from key sectors of society – including health, agriculture, water and sanitation, social protection and education – as well as the private sector and families and communities, are needed to guarantee that nutritious food is available, affordable, safe and provided with care to all children.

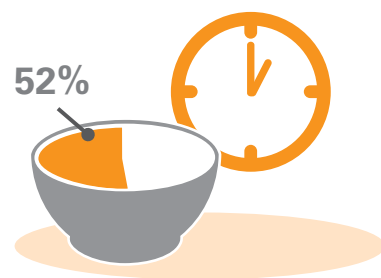
# Too few infants and young children receive enough nutritious foods

More infants are being fed solid foods at the recommended age than in the year 2000 – but **one third** are still waiting too long for their first bites.



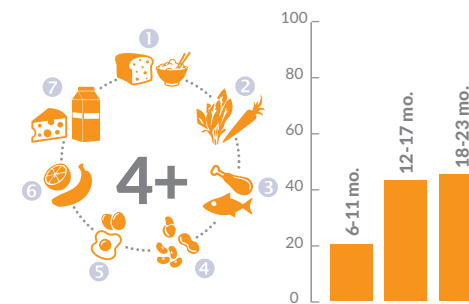
Trends in the per cent of infants 6-8 months of age fed solid, semi-solid or soft foods in the previous day, 2000 and 2015.

**Only half** of children 6 to 23 months of age are fed the minimum number of meals a day for their age.



The per cent of children 6-23 months of age who were fed the minimum number of times or more in the previous day, 2015.

Minimum diet diversity is **lowest** among the **youngest children:** the age group for whom it is most critical.



The per cent of children 6-23 months of age who received food from at least 4 food groups in the previous day, 2015.

Globally, only **1 in every 6** children is receiving a minimum acceptable diet.



The minimum acceptable diet refers to meeting both the minimum meal frequency and minimum diet diversity.

**Families do their best with the resources they have to provide enough nutritious meals for their children – but they cannot do it alone. Government leadership and contributions from key sectors of society are needed to provide children with a healthy diet.**



A woman breastfeeds her newborn at the KBC Zvezdara Maternity Hospital in Belgrade.  
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# INTRODUCTION

## **What and how children are fed – particularly in the first two years of life – is critical to their health, development and survival**

In every country in the world, parents and caregivers invest time, money, and care into the foods they provide for their children, but despite their best efforts, they face immense challenges. While the past decade has seen global progress in reducing chronic malnutrition, stunting still affects 156 million children under five globally. At the same time, 42 million children are overweight or obese – 11 million more than there were in the year 2000.<sup>1</sup> Families the world over are clearly facing complex economic, political, social and cultural barriers to providing children with adequate quantities of safe, nutritious and age-appropriate foods.

Food and feeding practices from birth to age 2 have a profound impact on the rest of a child's life. Good nutrition helps children exercise their rights to grow, learn, develop, participate and become productive members of their communities. As children thrive, nations prosper: good nutrition drives human capital, lifts families out of poverty, and paves the way for a more sustainable future.

We know that in rich and poor countries alike, breastfeeding saves lives and gives children the best start.<sup>2</sup> While the evidence on the power of

breastfeeding for lifelong health and prosperity is stronger than ever, too few children are benefiting.

As children reach the age of 6 months, it is critical that they transition from exclusive breastfeeding to eating solid, semi-solid and soft foods alongside breastmilk to ensure they receive the nutrients they need to grow and develop. Yet many children are either introduced to these complementary foods too early or too late for optimal health and development. Most children are also not fed an adequate and diverse diet, leaving them without the vital nutrients required to reach their full potential.

With the adoption of the 2030 Agenda for Sustainable Development, improving infant and young child feeding practices has never been more urgent. Good nutrition in early life is central to achieving Sustainable Development Goal (SDG) 2 on ending hunger, achieving food security and improving nutrition – and will also set countries on the right path to achieving the SDGs of improving health, ending poverty, promoting economic growth, reducing inequalities, ensuring quality education, promoting gender equality and ensuring sustainable consumption. Government leadership and investments, as well as contributions at all levels of society, will be critical in driving these achievements.

Action to galvanize investments in breastfeeding is gaining momentum under the leadership of the Global Breastfeeding Advocacy Initiative, a partnership of 18 global organizations, led by UNICEF and the World Health Organization (WHO). There have also been renewed global efforts to improve complementary feeding practices, which culminated in the 'First Foods' global meeting, held in India in 2015. The conference resulted in a set of recommendations to countries for accelerating progress on complementary feeding.

This report, *From the First Hour of Life: Making the case for improved infant and young child feeding everywhere*, provides a global status update on infant and young child feeding practices and puts forth recommendations for improving them.

The report is divided into two parts: part one focuses on breastfeeding and part two looks at complementary feeding practices. Each chapter reviews the evidence for a different infant and young child feeding indicator and describes the most recent global and regional estimates for that practice. The first and second parts of the report each conclude with a discussion of the way forward, including recommendations to governments for accelerating progress on breastfeeding and complementary feeding practices at the national level.

## Introduction

# THE IMPORTANCE OF BREASTFEEDING

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We know that in rich and poor countries alike, breastfeeding saves lives and gives children the healthiest start.

### What are the recommended breastfeeding practices?

The WHO and UNICEF Global Strategy for Infant and Young Child Feeding outlines three recommended breastfeeding practices:

- Early initiation of breastfeeding – place newborns skin-to-skin with their mother immediately after birth, and support mothers to initiate breastfeeding within the baby’s first hour of life.
- Exclusive breastfeeding – provide only breastmilk to infants from birth until 6 months of age, with no other food or liquids (including water).
- Continued breastfeeding – breastfeeding until age 2 or longer, in addition to adequate and safe solid, semi-solid or soft foods (also called complementary foods).

### What are the direct impacts of breastfeeding?

Breastmilk is safe: it is the right temperature, requires no preparation, and is available even in environments with poor sanitation and unsafe drinking water.

Immediate skin-to skin contact and starting breastfeeding early keeps a baby warm, builds his or her immune system, promotes bonding, boosts a mother’s milk supply and increases the chances that she will be able to continue exclusive breastfeeding.

Breastmilk is more than just food for babies – it is also a potent medicine for disease prevention that is tailored to the needs of each child. The ‘first milk’ – or colostrum – is rich in antibodies to protect babies from disease and death.

Breastfeeding keeps infants safe from unhygienic environments and contaminants in foods that can cause diarrhoea and lead to nutrient loss and undernutrition. This benefit is particularly important in humanitarian settings, where these risks may be exacerbated.

Breastfed babies are less susceptible to ear infections, diarrhoea, pneumonia and other childhood illnesses. Nearly half of all diarrhoea episodes and one third of all respiratory infections could be prevented by improving breastfeeding practices in low- and middle-income countries.<sup>3</sup> When a mother falls ill, she produces antibodies in her breastmilk to fight the infection, to which her baby is also exposed and benefits from. This immunological communication between mother and baby makes breastmilk ‘the most personalized form of medicine that any of us will receive in our lifetime’. It means that a mother’s body can write a prescription for illness that is unique to her baby’s needs and environment.<sup>2</sup>

Continued breastfeeding up to age 2 or longer can provide babies with nutrients that are unavailable in settings with limited access to a diverse range of complementary foods.<sup>4</sup>

## What are the medium- and long-term impacts?

In rich and poor countries alike, long periods of breastfeeding are associated with higher intelligence scores – and there is evidence that this translates into improved academic performance and increased long-term earnings.

There is growing evidence that breastfeeding may also reduce the incidence of overweight, obesity and chronic diseases like diabetes later in life.<sup>2</sup>

Breastfeeding mothers also have a lower risk of developing breast and ovarian cancers. Improving breastfeeding practices could prevent 20,000 maternal deaths due to breast cancer every year.<sup>2</sup>

Breastfeeding can also delay ovulation, helping women to better space their pregnancies.<sup>5</sup>

Low rates of breastfeeding are responsible for losses of more than \$230 billion annually in high-income countries, and \$70 billion annually in low- and middle-income countries.<sup>6</sup>

The case for breastfeeding is solid and compelling. It is a high-impact, cost-effective solution for saving children's lives. Breastfeeding is one of the smartest investments to boost human capital, stimulate economic growth and give every child the same opportunity to thrive.

If scaled up to nearly universal levels, breastfeeding could save more than 800,000 child lives and add more than \$300 billion to the global economy each year.<sup>2,6</sup> From reduced disease incidence to economic returns, breastfeeding stimulates development gains at all levels and will be a key driver in achieving the SDGs.

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Breastfeeding is one of the smartest investments to boost human capital, stimulate economic growth and give every child the same opportunity to thrive.

## Introduction

# THE IMPORTANCE OF COMPLEMENTARY FEEDING

### What are the recommended complementary feeding practices?

As infants reach 6 months of age, they need to begin eating solid, semi-solid and soft foods in addition to breastmilk. These are referred to as complementary foods, as ideally they complement an already breastmilk-based diet.

The WHO and UNICEF Global Strategy for Infant and Young Child Feeding provides guidance on what, when and how children should be fed during the complementary feeding period – from 6 months to 2 years of age.<sup>7</sup> The recommended practices that are widely measured include:

- Introduction of solid, semi-solid and soft foods – introducing infants to solid, semi-solid and soft foods at 6 months of age.
- Minimum meal frequency – providing at least two meals per day to children 6–8 months old and three meals per day to children 9–23 months old. Non-breastfed children need to consume more solid foods: at least four meals a day between 6-23 months of age.
- Minimum dietary diversity – providing children with a diverse diet, comprising at least four food groups.

During feeding, the communication between caregiver and child is as important as the food

itself. Caregivers need to be responsive to the child's hunger signals, interact with the child and select appropriate foods. This is referred to as *responsive feeding*.

Good hygiene, including hand washing with clean water and soap, and safe food preparation and storage, are also critical to ensuring that food does not make children sick.

### What are the direct impacts of complementary feeding?

After 6 months of age, children's energy and nutrient needs become greater than what breastmilk alone can provide. Introducing solid, semi-solid or soft foods at 6 months of age helps to ensure that children are consuming adequate nutrients and helps to prevent deficiencies that could result in undernutrition.<sup>8,9</sup>

As children transition from exclusive breastfeeding to complementary foods alongside breastmilk, their risk of infection increases. Continued breastfeeding during the complementary feeding period provides a consistent, safe source of energy and helps ensure that children receive the nutrients their bodies need during and after periods of illness, when their appetite for solid foods may decrease.<sup>9</sup>

Because infants and children have small stomachs, they can only consume small amounts of food with each feeding. Eating meals frequently throughout the day helps them to have enough energy to fuel their developing brains and bodies.

Eating a diverse range of foods also ensures that children receive the vitamins and minerals they need to grow, develop and keep their immune systems strong and healthy.

When caregivers practice responsive feeding, babies thrive. Stimulating and interacting with the child during feeding improves brain development during a critical growth period.<sup>10,11</sup> Responsive feeding makes children less likely to refuse food when it's offered, can help children learn to self-regulate their food intake and encourages them to begin self-feeding earlier.<sup>12-14</sup>

### What are the medium- and longer-term impacts?

Introducing children to healthy and diverse foods at an early age helps to establish taste preferences and good eating habits later in life. There is evidence that consuming fruits and vegetables in later infancy is predictive of consumption later in childhood.<sup>15</sup>



An estimated 250 million children under five in low- and middle-income countries are at risk of suboptimal development due to poverty and stunting.<sup>16</sup> The combination of a nutritious diet and a responsive and nurturing caregiver improves children's brain development for life. Evidence suggests that interventions that promote stimulation, responsive feeding and good nutrition together have enduring cognitive benefits for children that are greater than when these same interventions are provided alone.<sup>10, 17</sup>

Stunting and micronutrient deficiencies cast a long shadow over a lifetime: they blunt children's brain development, diminishing their learning capacity, school performance and adult earning potential. It is estimated that stunted children earn approximately 20 per cent less as adults compared with non-stunted individuals.<sup>18, 19</sup>

Stunting is also a risk factor for overweight. Stunted children who gain weight rapidly in childhood face a greater risk of becoming overweight as adults, exposing them to an increased risk of chronic disease.<sup>20, 21</sup>

The consequences of stunting carry across generations: short-statured mothers have a higher risk of delivering low birthweight babies,<sup>22</sup> and the children of short-statured mothers also have a greater risk of neonatal

mortality compared with children whose mothers are of greater height.<sup>23</sup>

Stunting and other forms of malnutrition are a drain on economies and a barrier to sustainable development. A 1 per cent loss in adult height due to stunting is associated with a 1.4 per cent loss in economic productivity.<sup>24</sup> Early growth faltering is estimated to be responsible for US\$177 billion in lost wages each year in low- and middle-income countries.<sup>19</sup>

A diverse, frequent and acceptable diet is essential to preventing micronutrient deficiencies, stunting and wasting. If appropriate complementary feeding practices were scaled-up to nearly universal levels, approximately 100,000 deaths in children under five could be averted each year.<sup>25</sup>

Nutritious diets are the fuel for sustainable development. Combined with a responsive caregiver and a safe environment, good nutrition promotes positive outcomes within households, communities and nations.

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As children thrive, nations prosper: good nutrition drives human capital, lifts families out of poverty and paves the way for a more sustainable future.

## Introduction

# BETTER SUPPORT FOR BREASTFEEDING

### What does breastfeeding support look like?

While breastfeeding is a personal relationship between mother and baby, it is not a one-woman job. It requires a wider network of support from families, communities, workplaces and the health system, as well as government leadership, to really make it work.

We must recognize that building breastfeeding-friendly policies, health systems, workplaces and communities is everyone's responsibility.<sup>6</sup>

While breastmilk is nature's perfect food for babies, the act of breastfeeding does not always come naturally. For breastfeeding to succeed, women need access to skilled support and guidance. Skilled support empowers women and builds confidence that translates into better breastfeeding rates.

Breastfeeding may be cost-effective, but it is not free; it requires a significant investment of time and energy on the part of mothers. Children, especially newborns, feed around the clock and do not wait for jobs, household chores or childcare responsibilities. Families, communities and workplaces each have a role to play in affording women the time and space necessary to breastfeed.

**Government** – leadership is needed to pass and enforce national laws and policies that reflect the collective responsibility to protect, promote and support breastfeeding. By enacting legislation to restrict the marketing of breastmilk substitutes – and monitoring its compliance – governments can act against unethical business practices and send the message that breastfeeding matters. Enacting legislation on paid maternity leave and breastfeeding breaks in line with ILO Convention 183 ensures that breastfeeding

and work are not mutually exclusive. In addition, adequate funding should be allocated for the implementation of interventions that support breastfeeding.

**Health-care system** – most mothers will tell you that breastfeeding can be a challenging skill to learn; health-care workers skilled in lactation counselling are needed to provide guidance and support to new or struggling mothers. Hospitals should also protect, promote and support breastfeeding – for example, by strengthening the Ten Steps of the Baby-Friendly Hospital Initiative (BFHI).

**Workplace** – paid and unpaid work is a common obstacle to breastfeeding; adequate maternity or parental leave, childcare support, nursing breaks and designated spaces to express milk are vital supports for working mothers.

**Community** – communities can be welcoming or hostile places for breastfeeding. Everyone wins when breastfeeding is normalized and women feel comfortable nursing their babies anyplace and anytime. Strengthened linkages between communities and health facilities may also encourage community networks to support breastfeeding.

**Family** – fathers, grandparents and other relatives often influence the way babies are fed; mothers are better able to breastfeed when they have the support of their families through positive encouragement and the sharing of household responsibilities.

# Breastfeeding is not a one-woman job



– it requires government leadership and support from families, communities, workplaces and the health system to really make it work.

## Introduction

# BETTER SUPPORT FOR COMPLEMENTARY FEEDING

### What does support for complementary feeding look like?

Families are not the only ones responsible for providing their children with nutritious foods. Guaranteeing children healthy diets requires government leadership and contributions from key sectors of society as well as communities and families.

Complementary feeding involves a complex set of behaviours: timely introduction of solid, semi-solid and soft foods; providing diverse food choices; feeding frequently; being responsive to children's cues and preparing foods safely. Caregivers around the world face multiple barriers in feeding their children, such as limited access to adequate nutritious foods, economic constraints, family pressures, work demands and cultural norms and practices. To improve complementary feeding we need to do more than just provide children with enough food to eat; we need guarantees that nutritious complementary foods are available, affordable, safe and provided with care.

Leadership is needed from government to keep up with the changing landscape of food promotion, access and nutritional quality. Within households and communities, improving complementary feeding practices requires nutrition education and behaviour change strategies to support caregivers in adopting the recommended feeding practices using locally available foods.

**Governments** are ultimately responsible for investing in complementary feeding policies and programmes and coordinating actions across sectors to make good nutrition in the earliest years a priority. Their leadership is needed to: enact national laws, policies and strategies; engage multiple sectors to foster a supportive enabling environment for nutrition; and adopt,

monitor and enforce regulations on the commercial promotion of unhealthy foods.

Based on sound situation analyses of the barriers to improved complementary feeding in a given context, governments may need to engage multiple sectors outside of **health** and nutrition to address issues of access, availability and safety of foods, including: **agriculture, water and sanitation, social protection, education and the private sector.**

Collaboration across these sectors can help:

- Improve food systems and address global pressures impacting the availability of nutritious foods, including: climate change, loss of ecosystems and land degradation, natural disasters, conflicts and other humanitarian crises;
- Support markets for affordable, nutritious foods, and develop cash transfer programmes, subsidies and other mechanisms to ensure that nutritious food is affordable for all families; and
- Improve access to safe water to clean food, hands and utensils and prevent the spread of disease, and ensure prompt access to treatment for illnesses such as diarrhoea, which deplete nutrient stores and make children more susceptible to malnutrition in the first place.

**Communities and families** also need to be engaged to create supportive environments for early childhood stimulation and responsive feeding and parenting.

Children's diets are a shared responsibility – no single household can do it alone.



All sectors of society need to contribute to guarantee that nutritious food for children is available, affordable, safe and provided with care.

## Introduction

# MEASURING PROGRESS AGAINST RECOMMENDED PRACTICES

Global reporting on goals and targets across a variety of sectors is possible because standard indicators exist which enable the generation of comparable estimates across countries. In nutrition, a wealth of data related to infant and young child feeding practices are now available as a result of inter-agency methodological work on breastfeeding indicators from the 1990s and, more recently, on indicators related to feeding of solid foods.<sup>26</sup>

Major data collection efforts such as the Multiple Indicator Cluster Surveys (MICS) and Demographic and Health Surveys (DHS) have also helped to improve data availability. As standard breastfeeding indicators have been available for about two decades, this report presents trends on breastfeeding. However, as standard indicators about feeding of solid foods in the 6–23-month period were endorsed more recently, data are only available from 2010 onward, meaning only current status is available to present in this report.

Almost all infant and young child feeding indicators reflect current status, meaning that caregivers provide responses to household survey questionnaires about what infants and young children between 0 months and 23 months<sup>27</sup> of age were fed in the day before the survey. These rates represent the percentage of children in the entire age group that are undertaking the desired practice.

One reason that indicators of current status are used instead of a retrospective assessment over a longer time period is to reduce errors in accuracy or completeness of recollection of events that occurred far in the past, especially for practices which can vary on a day-to-day basis. However, indicators of current status can be misunderstood. A common misunderstanding is that exclusive breastfeeding rates represent the proportion of children who did not receive anything other than breastmilk from birth until 6 months of age, but

in fact the indicator represents the proportion of all children currently aged 0–5 months that received only breastmilk at the time of data collection.

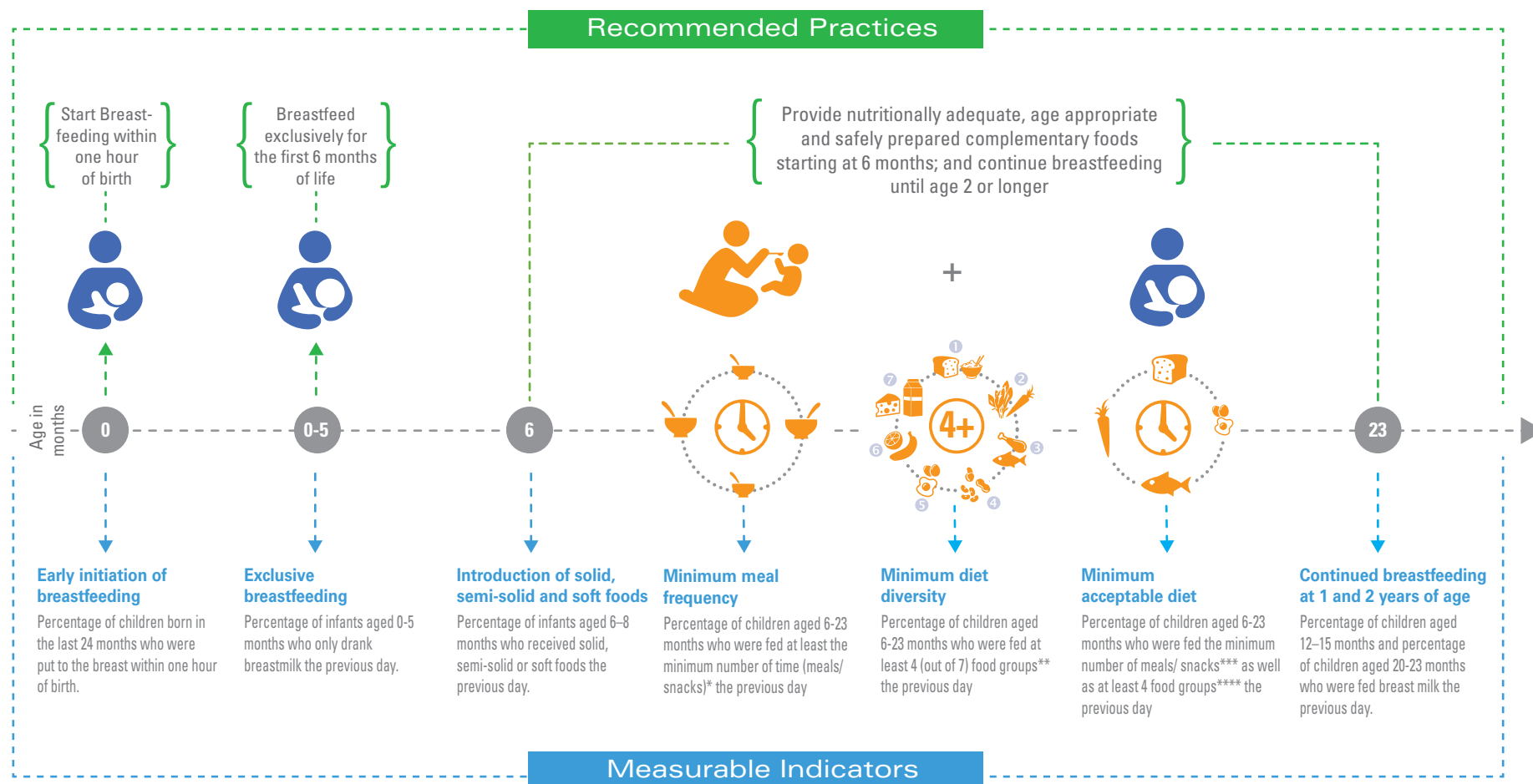
There is only one infant and young child feeding indicator that does not reflect current status, but uses a recall window of up to two years. All women who have given birth in the past two years are asked when they put their baby to breast. This is because it is not possible to collect current status information through a household survey at the time of birth.

Each of the standard infant and young child feeding indicators presented in this report is related to a recommended practice (*see the figure on the right*). While this covers a number of important dimensions regarding appropriate infant and young child feeding, there are even more that cannot be measured at the population level. For example, WHO's 'Guiding Principles for Complementary Feeding of the Breastfed Child' outlines six principles for which it has not been possible to develop indicators for population-based assessment. These include responsive feeding, safe food preparation and storage and food consistency. Indicators for other aspects of young child feeding, such as consumption of unhealthy food items, are also not available, but would be important to consider given their growing presence in rich and poor countries alike.

### Why disaggregated data aren't always available

While the majority of infant and young child feeding indicators allow for country, regional and global tracking of key practices, there are limitations. A main shortcoming is the inability to report on subgroups due to small sample sizes, especially where recommended practices are limited to a small age range, as is the case for exclusive breastfeeding (ages 0–5 months<sup>28</sup>) and introduction to solids (ages 6–8 months). For the current status indicators where the age span ranges 6 months or less, total/national estimates are usually robust enough to present, but the sample sizes are generally too small to assess how the poorest compare with the richest, how rates vary by mother's education, or even how girls compare with boys. Therefore, in this report, presentation of results by different background characteristics is limited to current status indicators with larger age ranges (6–23 months), the one retrospective topic which covers initiation of breastfeeding as well as continued breastfeeding where an alternate age range of 12–23 months was used to provide some equity information on this practice, even if not for the standard indicator age range.

# Available indicators for recommended feeding practices



\* Minimum number of meals/snacks per day: 2x for breastfed infants 6-8 months; 3x for breastfed children 9-23 months; 4 times for non-breastfed children 6-23 months (and can include milk/formula feeds for non-breastfed children).  
 \*\* Minimum diet diversity is based on 7 food groups of: (1) grains, roots, tubers,; (2) vitamin A rich fruits and vegetables; (3) flesh foods such as meat, fish and poultry; (4) legumes, nuts and seeds; (5) eggs; (6) other fruits and vegetables; (7) dairy products. \*\*\* For the composite indicator of MAD, minimum meal frequency requires at least 2 milk feeds for non-breastfed children; \*\*\*\* For the Composite indicator MAD, diet diversity is based out of 6 and not 7 food groups for non-breastfeeding children.

## Introduction

# THE CONTINUUM OF FEEDING PRACTICES

If the world was issued a scorecard for the way its infants and young children were fed it would receive a failing grade. Across the continuum of feeding practices, the vast majority of newborns, infants and young children are not receiving the nutrition they need to survive and grow to reach their full potential.

Despite the lifesaving power of breastfeeding, fewer than half of newborns are put to the breast within the first hour after birth and breastfed exclusively for the first 6 months of life. While almost three out of four children receive some breastmilk past one year, less than half are breastfed until the recommended two years or longer.

The introduction of solid, semi-solid or soft foods should occur at the age of 6 months, yet about one in three infants receive foods too late for optimal development. After 6 months of age, just over half of all children are fed the minimum number of meals throughout the day and only about one in three children aged 6–23 months are eating the minimum number of food groups, leaving them vulnerable to micronutrient deficiencies and stunting.

Together, the number of children eating both a diverse and frequent diet – a minimally acceptable diet – is shockingly low: only one in six children in low and middle income countries is receiving enough nutritious foods.

Moving forward, there is a need to find new ways to measure the nutritional variety of children’s diets to account for the consumption of unhealthy foods and beverages, in order to better evaluate children’s risk of overweight, obesity and other chronic diseases later in life.

Despite the troubling figures, we already know many of the solutions needed to accelerate progress on these infant and young child feeding practices. With the right commitment and investments from governments, guidance on how best to scale-up proven infant and young child feeding interventions and better knowledge of the current situation, there is great potential to create a better and more equitable future for all children.

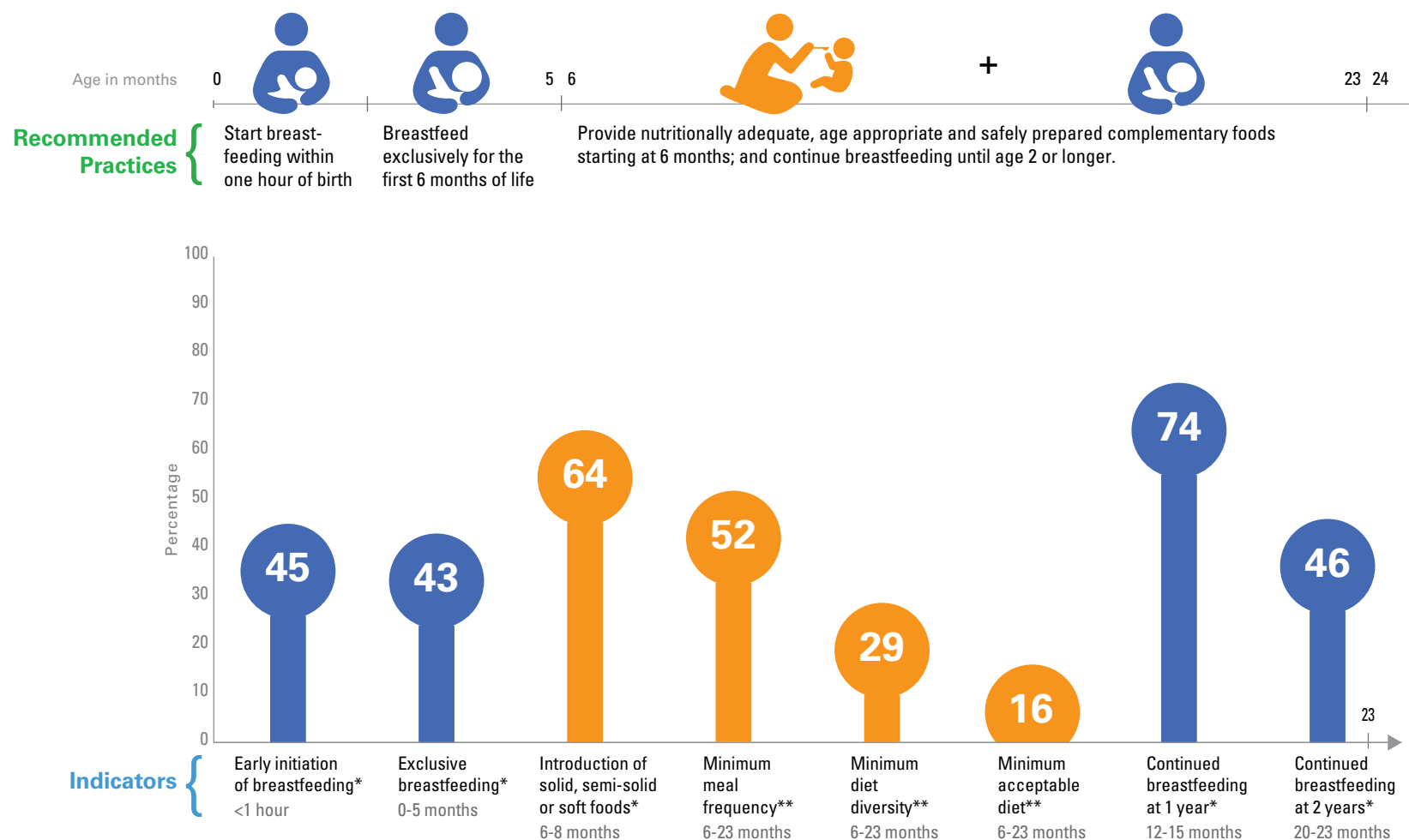
The remainder of this report is divided into two parts: Part I – focus on breastfeeding; and Part II – focus on complementary feeding. Each part reviews the most recent evidence on infant and young child feeding practices and provides updated global and regional estimates and trends, where available, as well as disaggregated analyses.

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If the world was issued a scorecard for the way its infants and young children were fed it would receive a failing grade.



# Across the continuum, too few children are getting the nutrition they need to survive, grow and develop



Per cent of children: put to the breast within one hour of birth, exclusively breastfed (0-5 months); introduced to solid, semi-solid or soft foods (6-8 months), with a minimum meal frequency, minimum diet diversity and minimum acceptable diet (6-23 months) and continued breastfeeding at 1 year (12-15 months) and 2 years (20-23 months), 2015\*.

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

Note: Data included in these global averages are the most recent for each country between 2010-2016. \*Aggregates for these indicators use China, 2008; \*\*Aggregates for these indicators do not include China due to lack of data and while >50% of the global population coverage was met, almost all of the data for these indicators are from low and lower middle income countries.





PART I

# **Focus on Breastfeeding**



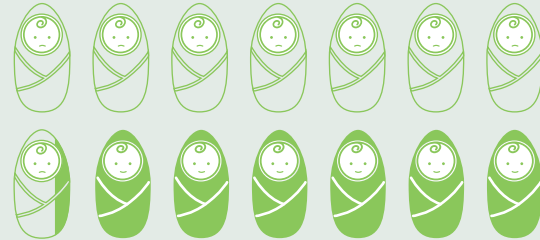
A midwife assists a woman who is breastfeeding her baby 30 minutes after the baby's birth, at an integrated community health centre in Maradi Commune II, Maradi Department. UNICEF supports the health centre with supplies. © UNICEF/UNI109441/Pirozzi

# EARLY INITIATION OF BREASTFEEDING

Of the 140 million live  
births in 2015,

**77 million**

newborns had to wait  
too long to be put to the  
breast.



*Only 45 per cent of newborns were put to  
the breast within the first hour of life.*

*(Each silhouette represents 10 million newborns)*

## Early initiation of breastfeeding

# FOR NEWBORNS AROUND THE WORLD, EVERY MINUTE COUNTS

### Why does early initiation matter?

When it comes to breastfeeding, timing can mean the difference between life and death. Early initiation of breastfeeding – putting newborns to the breast within the first hour of life – safeguards infants from dying during the most vulnerable time in their lives. New evidence indicates that when compared with newborns who were put to the breast within an hour of birth, the risk of dying in the first 28 days of life is 41 per cent higher for those who initiated 2–23 hours after birth, and 79 per cent higher for those who initiated one day or longer after birth.<sup>1</sup> We have known for

some time that early initiation helps to establish exclusive breastfeeding – a life-saving practice. These new findings also confirm that getting an early start to breastfeeding boosts child survival in its own right and that the protective benefit extends well beyond the first month, until the age of 6 months.<sup>1</sup>

Colostrum, the first milk, is rich in antibodies and gives newborns an immunity boost, while their own immune systems are still developing. The composition of breastmilk is unique to each infant-mother pair, made specifically to address the child's needs at any moment in time (*see box, below*).

Placing a newborn on the mother's bare chest – known as skin-to-skin contact – is a key component of early initiation. Skin-to-skin contact helps reduce mortality by, among other things, regulating a newborn's temperature, heart rate and breathing, while also facilitating breastfeeding. Mothers practicing early skin-to-skin contact with their newborns are more likely to breastfeed in the first 1 to 4 months of their child's life and to continue for longer durations.<sup>2</sup> In some countries, the rise in Caesarean deliveries has reduced this crucial practice and delayed breastfeeding initiation; however, with the right support, even most newborns delivered by Caesarean section can be put to the breast within the first hour of life.<sup>3</sup>

### Breastmilk – cultivating good gut health for life

Breastfeeding is a unique and powerful medium of communication between mother and baby. Mothers transmit elements of their microbiota and microbiome – the myriad of bacteria that live in the human body as well as their genetic material – to their children through breastmilk. These 'good bacteria' live in the gut and help fight disease, digest food and regulate our immune systems. They are genetically specific to each woman's body and connected to the environment in which she lives.<sup>4</sup>

Breastmilk provides these good bacteria with food, in the form of hundreds of complex chains of sugars that are only found in human milk. These sugars not only feed healthy bacteria, but they also starve dangerous bacteria and prevent them from growing. This process helps to programme the healthy development of the infant's gut microbiome for life.<sup>5</sup>

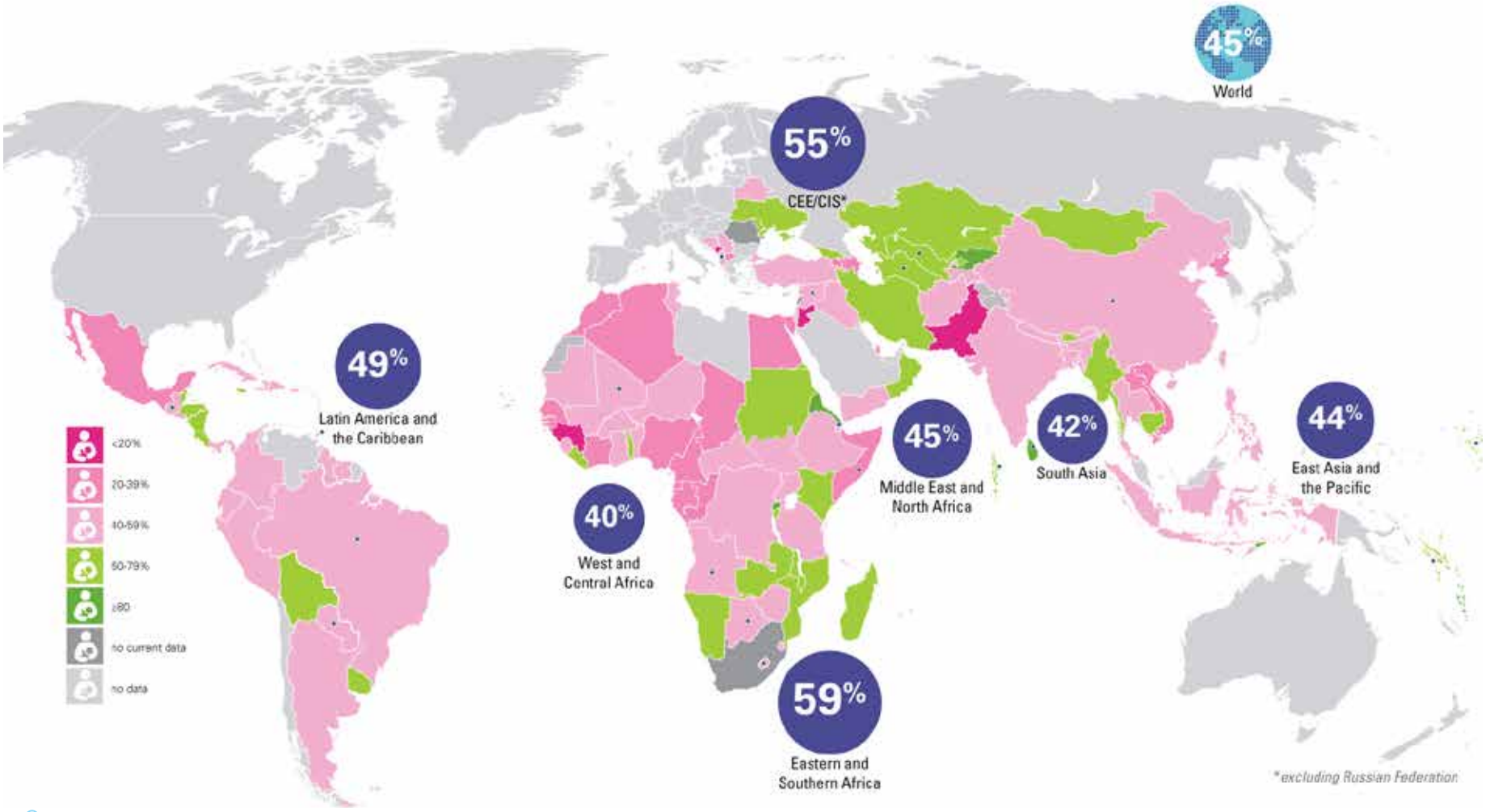
Through the dynamic, biological process of breastfeeding, infants can tell their mothers exactly what they need at a specific moment in time. As infants breastfeed, the immune composition of breastmilk adjusts in response to the properties of their saliva. If pathogens are detected, the mother's body may produce antibodies to fight them. In this way, breastmilk is more than just food – it is also a potent medicine, tailored exactly to a child's needs by his or her mother's body.

In the earliest days of life, components of breastmilk can positively influence the way some genes are expressed, or 'turned on' – with effects that last a lifetime.<sup>6</sup> There is evidence, for example, that breastmilk can help to counteract an infant's genetic predisposition for obesity and other chronic diseases.<sup>7</sup>

### What do the numbers tell us?

Globally, less than half of all newborns are put to the breast within an hour of birth. That leaves 77 million newborns waiting too long for this first critical contact with their mother outside of the womb. Five regions have early initiation rates below 50 per cent. The highest rates of early initiation are in Eastern and Southern Africa. However, even in this region, which has one of the highest rates of infant mortality in the world, just three out of five newborns are reaping the benefits of early initiation on survival. Due to the lack of available data in the majority of high-income countries, we know very little about early initiation in these settings.

# Globally, less than half of all newborns are put to the breast within



Per cent of newborns put to the breast within one hour of birth, by country and region, 2015

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016 (● denotes countries with older data between 2005-2009; data from these countries are not included in the regional aggregates except for China (2008) which is used for the East Asia and the Pacific and World averages). Countries shaded in dark grey have estimates from 2004 or earlier and are thus represented as having "no current data"; these countries are not included in the regional aggregates. \*CEE/CIS does not include Russian Federation. **Note:** These maps are stylized and not to scale and do not reflect the position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

# Trends in the early initiation of breastfeeding

## A CALL TO INTENSIFY OUR EFFORTS

### Are we making progress?

Progress to improve early initiation rates has been slow over the past 15 years, with global rates increasing by just 14 percentage points overall. The trend is similar in Eastern and Southern Africa and Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS), which have each experienced moderate increases of about 10 percentage points since 2000. Most troubling are the situations in East Asia and the Pacific and West and Central Africa, where there has been no improvement at all in the past 15 years.

The exception to these trends is South Asia, which has nearly tripled its rates of early initiation, from 16 per cent in 2000 to 45 per cent in 2015. While this progress is encouraging, there is a need to further boost early initiation rates, which still sit below 50 per cent in the region, leaving 21 million newborns waiting too long for the health benefits and comfort provided by breastfeeding.

### Why should we act now?

While under-five mortality has declined substantially over the past 15 years, neonatal mortality – the probability of dying in the first 28 days of life – has not gone down to the same degree. In 2015, neonatal deaths accounted for 45 per cent of all under-5 deaths.<sup>8,9</sup>

In order to support the achievement of the 2030 SDG target to end preventable child deaths, and reduce neonatal mortality to at least as low as 12 per 1,000 live births, we need to ensure that all newborns are put to the breast within the first hour of life.

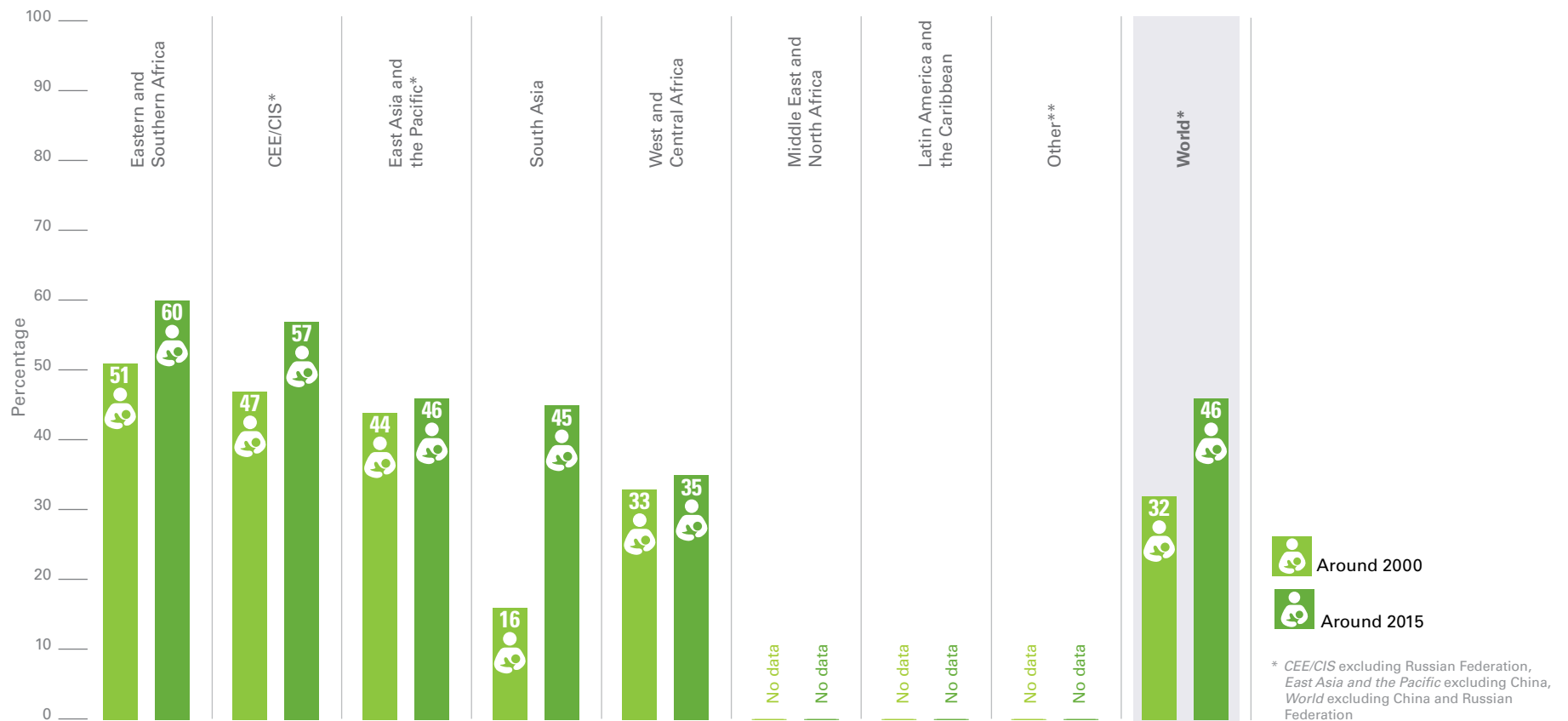
The Every Newborn Action Plan<sup>10</sup> calls for the early initiation of breastfeeding in its road map and joint action platform for the reduction of preventable neonatal mortality. All regions must do more to ensure that every newborn benefits from this simple and effective practice.

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All regions must do more to ensure that every newborn benefits from this simple and effective practice.



# Several regions have made progress, but globally, more than half of newborns are left waiting too long



Trends in per cent of newborns put to the breast within one hour of birth, by region, around 2000 and around 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

Note: Analysis is based on a subset of 48 countries with comparable trend data covering 55 per cent of the global population (excluding China and Russian Federation) for around 2000 (1997-2003) and around 2015 (2010-2016). Rates for 2015 may differ from current rates presented elsewhere as trends are based on a subset of countries with baseline data. Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China and CEE/CIS does not include Russian Federation. \*\*Other refers to mainly high-income countries not included within UNICEF programme regions.

## Feeding in the first days of life

# THE MYTH THAT NEWBORNS NEED MORE THAN BREASTMILK

### What else are breastfed newborns being fed in the first few days – and why does it matter?

It is common in many parts of the world to give newborns foods or liquids other than breastmilk in the first few days of life. This is linked to traditions, cultural norms, family practices, and health system policies and procedures – many of which are not grounded in evidence. In some places, traditional beliefs hold that colostrum is dangerous and the precious substance is discarded; in other settings, cultural practices involve feeding newborns tea, butter, sugar water, honey or animal milk before they are put to the breast.<sup>11</sup> Outdated practices of some maternity wards involve separating newborns from their mothers and giving them liquids such as sugar water or infant formula while their mothers rest.

Producers and distributors of breastmilk substitutes have invested enormous resources in changing the perception of infant formula from that of a specialized food, vital to infants who cannot breastfeed, to an appropriate substitute for any baby.<sup>12</sup> Yet infant formula, as well as other liquids or foods, can permanently alter the profile of good bacteria in the child's gut.

There is also the risk of contamination from these non-breastmilk feedings, particularly those containing water or honey, which can expose vulnerable newborns to life-threatening pathogens. In contrast, breastmilk is safe and contains a multitude of vitamins, minerals and enzymes to promote growth, as well as antibodies and good bacteria to shield children from disease.

When other foods and liquids are provided, they also take up valuable space in the newborn's small stomach, leaving little room for more complete breastmilk.

### What do the numbers tell us?

Nearly two out of five breastfed newborns receive foods or liquids other than breastmilk in the earliest days of life, when their bodies are most vulnerable.

Less than half of breastfed newborns in East Asia and the Pacific, the Middle East and North Africa and South Asia receive only breastmilk in the first three days of life. In East Asia and the Pacific, 42 per cent of newborns are given a milk-based liquid – such as infant formula or animal milk. Feeding newborns infant formula in the first three days of life is also common in Latin America and the Caribbean and CEE/CIS. In the Middle East and North Africa, 40 per cent of newborns receive non-milk-based liquids – such as plain water, sugar water or tea. In South Asia, both milk- and non-milk-based foods and liquids are commonly fed to newborns shortly after birth. The most common liquid given in the first three days after birth in West and Central Africa is plain water, which can harbour pathogens and other substances that are life-threatening for newborns.

# In three regions, more than half of breastfed newborns receive liquids or foods other than breastmilk in the first three days of life



Per cent of breastfed newborns\* receiving breastmilk only, non-milk-based liquids/foods, and milk-based liquids\*\* in the first three days of life, by region, 2015

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

**Notes:** Analysis is based on a subset of 72 countries with available data for feeding type in the first three days between 2010–2014 covering 47 per cent of the global population. Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \*Data represent newborns who were ever breastfed. No data on liquids consumed in the first three days of life were available for infants who were never breastfed. \*\*Children in this category may also have been fed non-milk-based liquids. \*\*\*To meet adequate population coverage in each region, CEE/CIS does not include Russian Federation, Latin America and the Caribbean does not include Brazil, South Asia does not include India and East Asia and the Pacific does not include China. The “Total” is not labeled as a global figure as data were available for <50% of the global population. \*\*\*\*Other refers to mainly high-income countries not included within UNICEF programme regions.

## Timing of initiation

# DELAYING THE FIRST CRITICAL CONTACT

### Does the timing of initiation vary when newborns receive anything other than breastmilk in the first days of life?

Feeding newborns anything other than breastmilk has the potential to delay their first critical contact with their mother. The evidence is clear that the longer this delay in breastfeeding initiation, the greater the risk of death.<sup>1</sup> It can also make it more difficult to establish breastfeeding over the long term. This is compounded when liquids are provided through a bottle with a teat, as it can interfere with the infant's natural ability to suckle at the breast. In contrast, putting babies to the breast within an hour of birth has been described as a 'gateway behaviour' that is strongly predictive of future exclusive breastfeeding.<sup>13,14</sup>

In some societies, special foods or drinks such as tea, butter, sugar water, honey or animal milk are provided as part of a birth ceremony that takes place before the newborn has been put to the breast.<sup>11</sup> Such ceremonies often require a revered family member or religious practitioner to perform certain duties,<sup>11</sup> and ensuring that person's presence can delay early initiation even longer, possibly past one day.

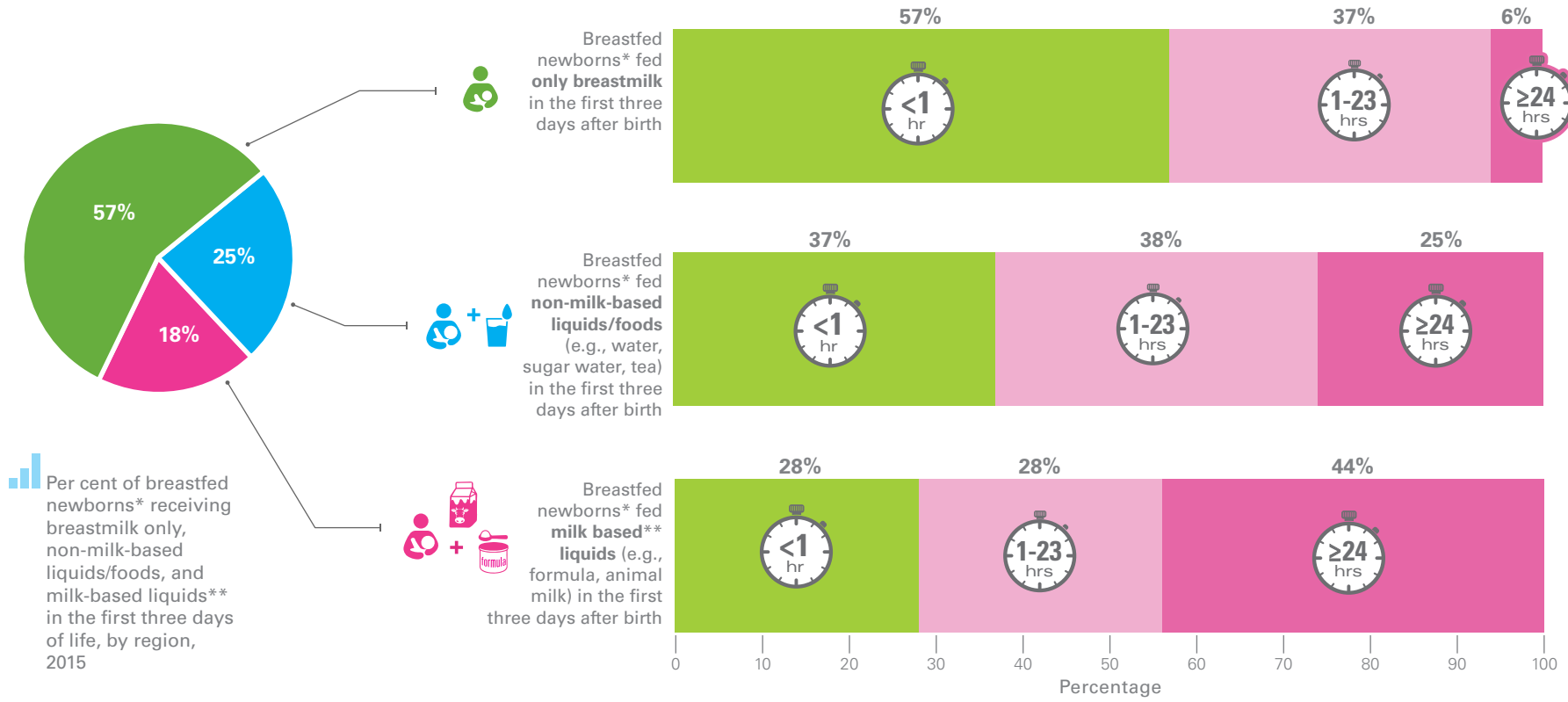
When colostrum feedings are replaced by less nutritious and often high-calorie alternatives like cow's milk, infant formula or sugar water, it creates a vicious cycle: these other liquids can satisfy the infant's hunger in the first days of life, causing him or her to breastfeed less frequently; and the reduced demand for breastfeeding makes breastmilk supply more difficult to establish and maintain. In this way, feeding foods and liquids other than breastmilk in the earliest days often marks 'the beginning of the end' of exclusive breastfeeding.

### What do the numbers tell us?

Of those newborns who received milk-based liquids in the first three days after birth, nearly half had to wait one day or longer to be put to the breast. This was based on an analysis of 72 countries with available data on timing of initiation and receipt of liquids and foods other than breastmilk.

In contrast, only 6 per cent of newborns who received only breastmilk in the first few days had to wait one day or longer to be put to the breast. While more than half of them benefited from early initiation, the fact that so many were not put to the breast earlier is a missed opportunity. We must identify why this life-saving practice is not starting sooner and take the necessary steps to ensure that every child is put to the breast within this first crucial hour.

# Nearly half of all newborns receiving milk-based liquids had to wait 24 hours or longer to be put to the breast



Per cent of infants put to the breast at <1 hour, 1-23 hours and ≥24 hours after birth, by feeding type in the first three days of life, 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.  
 Note: Analysis is based on a subset of 72 countries with available data between 2010-2014 for timing of initiation by feeding type in the first three days, covering 47 per cent of the global population; therefore this is not a global figure. \*Data represent newborns who were ever breastfed. No data on liquids consumed in the first three days of life were available for infants who were never breastfed. \*\*Children in this category may also have been fed non-milk-based liquids.

## Early initiation and birth attendants

# BETTER LEVERAGING AN EXISTING RESOURCE

### How can birth attendants support the early initiation of breastfeeding?

The support of a skilled attendant at the moment of birth helps mothers deliver newborns safely and saves lives. Globally, three quarters of all newborns are now delivered with the help of a skilled birth attendant, which includes doctors, nurses or midwives,<sup>15</sup> while the remaining are delivered by unskilled attendants (e.g., traditional birth attendants) or other friends and family members.

There are important opportunities for birth attendants to better support the early initiation of breastfeeding. While their presence at birth is essential for the health and safety of mother and child, alone it is not enough to ensure that breastfeeding begins on time; they should also take the lead in placing the newborn on the mother's chest within an hour of birth and help her initiate breastfeeding. To do this effectively, birth attendants must be trained with the knowledge and skills to provide the best support to mothers who might be facing challenges related to breastfeeding. Maternity facilities need to have policies in place that emphasize the importance of early initiation and monitor their implementation.

Research in Ethiopia has shown that mothers who give birth at home are seven times more

likely to feed newborns substances other than breastmilk when compared with mothers who deliver in health institutions.<sup>16</sup> This may be due to the misguided influence of family members and traditional birth attendants in the home, compared with the support of skilled attendants in health facilities.

However, health-care workers may also have misconceptions about early feeding practices, many of which are fueled by the invasive presence of the breastmilk substitute industry. This means that many inappropriate practices are still ingrained within maternity facilities around the world.<sup>14</sup> Such issues need to be addressed to ensure that the presence of a skilled attendant is leveraged to help – rather than hinder – early initiation.

### What do the numbers tell us?

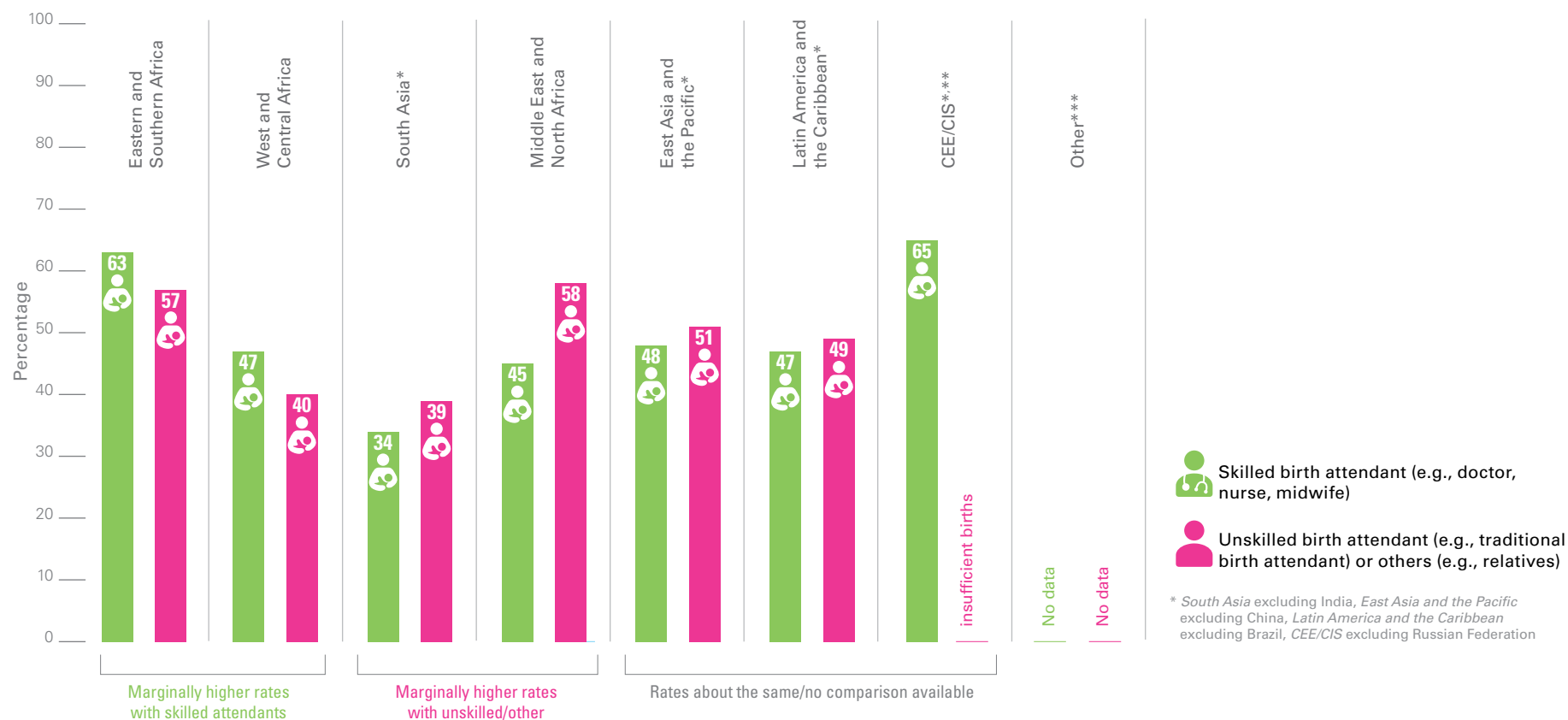
Despite the potential of skilled birth attendants to support mothers in initiating breastfeeding immediately after birth, in most regions studied, early initiation was not facilitated by the presence of a doctor, nurse or midwife. This was particularly true in South Asia and in the Middle East and North Africa, where early initiation rates were somewhat lower among births attended by skilled providers. Among countries studied in the Middle East and North Africa the rate of early initiation was 45 per cent for births attended by a skilled health provider

compared with 58 per cent for births attended by 'unskilled attendants or others.' The exception was sub-Saharan Africa, where early initiation rates were somewhat higher among births attended by skilled health providers.

In CEE/CIS, where almost all births are attended by skilled health providers, rates of early initiation are poor: only two thirds of newborns delivered by skilled attendants were put to the breast within an hour. In the countries studied in Latin America and the Caribbean, among newborns delivered by a skilled health provider, less than half were put to the breast within the first hour of life. These regions have some of the strongest health systems and access to skilled support in the world – they need to better leverage the presence of these health-care providers to improve breastfeeding.

There is enormous potential for skilled birth attendants to better support women in initiating breastfeeding immediately after birth – to not take advantage of this is a missed opportunity. Programmatic attention should be given to creating an enabling environment for breastfeeding within health facilities, including by improving the breastfeeding support provided by skilled birth attendants. They deliver the majority of the world's babies and are the easiest to reach with training and breastfeeding skill development.

# Skilled birth attendants can provide vital support for early initiation – we need to seize this opportunity



**Per cent of newborns put to the breast within one hour of birth by type of birth delivery attendant, by region, 2015**

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

Note: Analysis is based on a subset of 66 countries with recent (2010-2014) disaggregated data for early initiation rates by type of delivery provider covering 46 per cent of the global population. Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \* To meet adequate population coverage, South Asia does not include India, East Asia and the Pacific does not include China, Latin America and the Caribbean does not include Brazil and CEE/CIS does not include Russian Federation. \*\* Early initiation rates were not included for the birth attendant category of “Unskilled or other” for CEE/CIS because an insignificant proportion of births were delivered by these attendants in the majority of countries studied in this region and therefore did not allow for reliable early initiation estimates to be generated for this disaggregation. \*\*\* Other refers to mainly high-income countries not included within UNICEF programme regions.



A woman breastfeeds  
her child in Mexico City.  
© UNICEF/UNI182996/  
Quintos



# EXCLUSIVE BREASTFEEDING

**3 out of 5**

infants under 6 months of age are not receiving the protective benefits of exclusive breastfeeding.



## Exclusive breastfeeding

# A PROTECTIVE SHIELD FOR THE FIRST SIX MONTHS

### Why does exclusive breastfeeding matter for child survival and development?

Exclusive breastfeeding – feeding infants nothing but breastmilk for the first six months of life – is the safest and healthiest option for children everywhere. It has great potential to save lives. This is because exclusive breastfeeding guarantees infants a food source that is uniquely adapted to their needs, while also being safe, clean, healthy and accessible – no matter where they live. In low- and middle-income countries, infants who received mixed feeding (foods and liquids in addition to breastmilk before 6 months) were up to 2.8 times more likely to die than those who were exclusively breastfed.<sup>1</sup> The risk of dying was highest among those not breastfed at all; these infants had a 14-fold higher risk of mortality when compared with their exclusively breastfed peers.

There is overwhelming evidence that breastfeeding protects against pneumonia and diarrhoea – the two leading killers of children under five. In fact, improved breastfeeding could prevent nearly half of all diarrhoeal episodes and a third of all respiratory infections.<sup>2</sup> The impact on childhood infections exists in rich and poor countries alike. The UK Millennium Cohort Survey estimated that if all children in the United Kingdom were breastfed exclusively for six months, it could prevent 53 per cent of hospital admissions for

diarrhoea, and 27 per cent of hospitalizations for lower respiratory infections each month.<sup>3</sup>

Mothers share their immune systems with their babies through exclusive breastfeeding, and breastmilk promotes the growth of good bacteria, with lifelong benefits (*see box, page 18*). New research also suggests that pre-term infants fed only breastmilk have better long-term heart capacity and shape than those fed with infant formula.<sup>4</sup> Mothers benefit too, as exclusive breastfeeding delays ovulation,<sup>5</sup> thereby empowering them with greater reproductive autonomy, especially in settings with limited access to quality contraception.

Exclusive breastfeeding also facilitates interaction and bonding between mother and baby at a critical moment in early brain development when the right nourishment, positive stimulation and care can enhance the formation of neural pathways.<sup>6</sup>

While breastfeeding is common in most parts of the world, exclusive breastfeeding is not the norm; most infants are given other foods or liquids throughout the first six months due to cultural practices, other household, livelihood or employment barriers and the misguided belief that breastmilk alone is not enough. In the context of HIV, mothers may fear their breastmilk is harmful to their child. Yet mothers living with HIV can breastfeed safely when they

adhere to treatment (*see box, breastfeeding with HIV, page 34*).

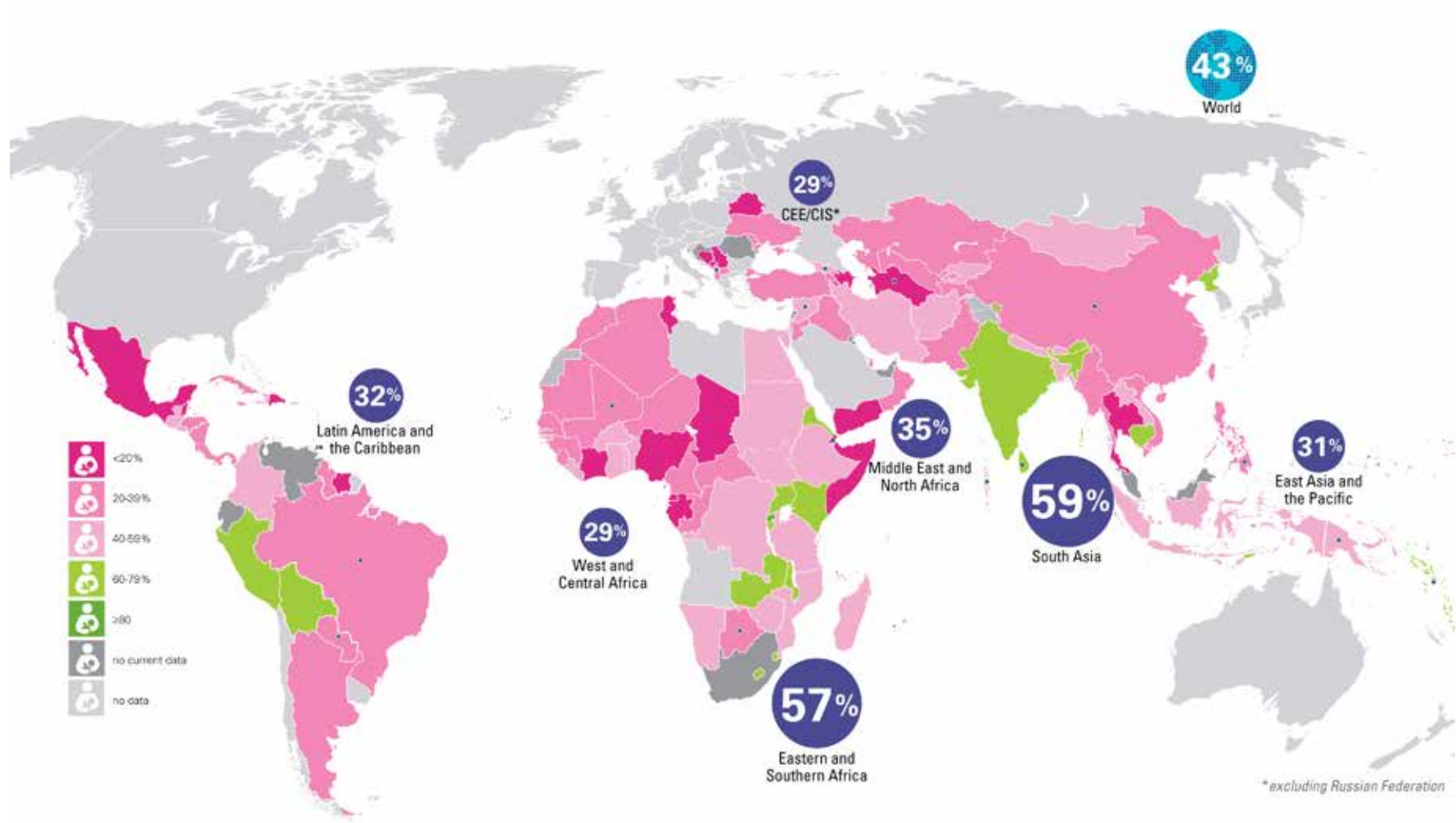
Various other factors can undermine women's confidence in exclusive breastfeeding – from the opinions of well-intentioned family members, to the advice of poorly trained health workers, to the influence of the breastmilk substitute industry. Exclusive breastfeeding for six months requires a considerable investment of time on the part of mothers. Societal pressures, family responsibilities and paid and unpaid work present significant challenges for women everywhere.

### What do the numbers tell us?

Globally, just over 40 per cent – or two out of five – of the world's infants under 6 months of age are exclusively breastfed.

The highest exclusive breastfeeding rates are found in South Asia, where almost 60 per cent of infants under 6 months of age receive only breastmilk, followed by Eastern and Southern Africa, where 57 per cent of infants under 6 months of age benefit from this practice. What is most concerning is that in the remaining regions only one third or fewer of young infants benefit from this practice. We still know very little about the situation in high-income countries, and it is imperative that we bridge this gap.

# Globally, just over two out of five infants are exclusively breastfed



 Per cent of infants 0-5 months of age exclusively breastfed, by country and region, 2015

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016 (• denotes countries with older data between 2005-2009; data from these countries are not included in the regional aggregates except for China (2008) which is used for the East Asia and the Pacific and World averages). Countries shaded in dark grey have estimates from 2004 or earlier and are thus represented as having "no current data"; these countries are not included in the regional aggregates. \*CEE/CIS does not include Russian Federation. **Note:** These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

# Infant feeding patterns

## WHAT STANDS IN OUR WAY

### What are babies around the world fed in the first 6 months – and why does it matter?

Infant feeding patterns vary across regions, but one thing is common to all: most infants receive other foods and liquids in addition to breastmilk during the first six months of life. Some infants are fed plain water; non-milk-based liquids (e.g., sugar water, tea); milk-based liquids (e.g., infant formula or animal milk); or solid, semi-solid or soft foods (e.g., cereals, rice, etc.). Other liquids and foods given during this time may displace breastmilk feedings, often resulting in reduced breastmilk production and early weaning.<sup>7</sup>

There is nothing more complete than breastmilk in the first six months; other foods and liquids are at best unnecessary and, at worst, life threatening. These substances can be contaminated with pathogens and can expose infants to infection, especially in the absence of clean drinking water and adequate sanitation. While the best protection against mortality comes from exclusive breastfeeding, even some breastfeeding has benefits when compared with not breastfeeding at all (*see graphic on the right*).<sup>1</sup>

Evidence has shown that foods introduced before 6 months of age add no growth advantage over exclusive breastfeeding.<sup>8</sup> Rather, there is evidence to suggest that

anything other than exclusive breastfeeding increases the risk of overweight and obesity.<sup>9</sup> Anything other than breastmilk is also hard on babies' developing digestive systems and threatens the healthy composition of bacteria in the gut (*see box, page 18*).<sup>2,10</sup> In addition, purchasing breastmilk substitutes can put an economic strain on families.

In low- and high-income countries alike, breastmilk is all children need during the first six months to survive, grow, develop and thrive.

### What do the numbers tell us?

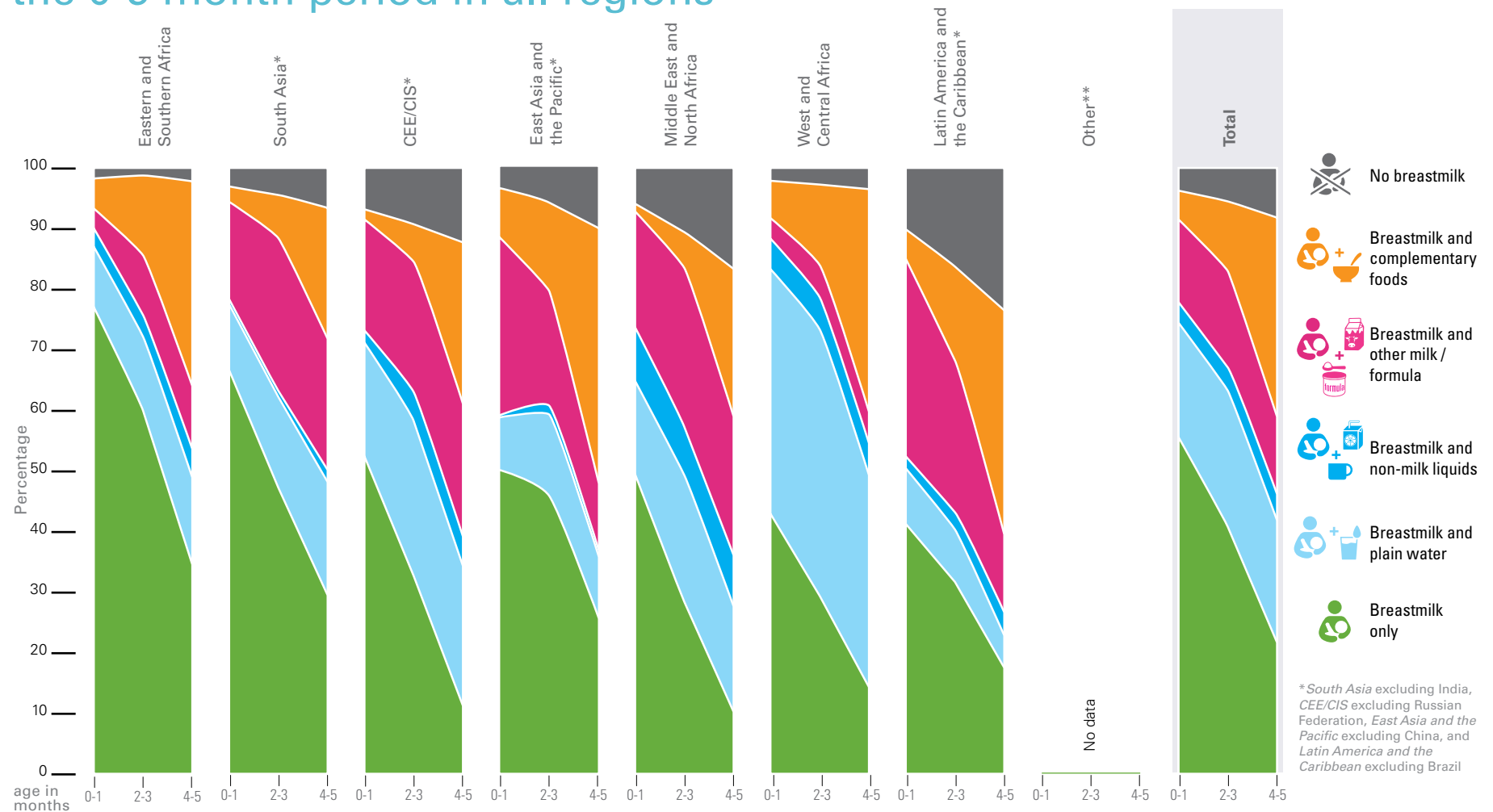
Area graphs illustrate feeding patterns for infants between birth and 5 months of age. The ideal pattern would be solid green to indicate exclusive breastfeeding. Other colors represent infants receiving foods and liquids in addition to breastmilk, as well as infants receiving no breastmilk at all.

In every region of the world, rates of exclusive breastfeeding decline steadily from birth to 5 months of age. Milk-based liquids are hindering exclusive breastfeeding to at least some degree in all regions. Where common, milk-based liquids are even fed to large proportions of infants as young as 0–1 months of age. In West and Central Africa, the greatest obstacle to exclusive breastfeeding is plain water. Significant numbers of infants are being

introduced to complementary foods too early in all regions, particularly in Latin America and the Caribbean. Many infants in this region are also not receiving any breastmilk at all.



# The rate of exclusive breastfeeding declines steadily throughout the 0-5 month period in all regions



Per cent of infants aged 0-5 months receiving breastmilk only, breastmilk and plain water, breastmilk and non-milk liquids, breastmilk and other milk/formula, breastmilk and complementary foods and no breastmilk, by region, 2016\*

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

Note: Analysis is based on a subset of 75 countries with available data for the development of area graphs covering 43 per cent of the global population. Regional estimates are presented only where adequate population coverage (≥ 50 per cent) is met. \*To meet adequate population coverage, South Asia does not include India, CEE/CIS does not include Russian Federation, East Asia and the Pacific does not include China and Latin America and the Caribbean does not include Brazil. The "Total" is not labelled as a global figure as data were available for <50% of the global population. \*\*Other refers to mainly high-income countries not included within UNICEF programme regions.

## Trends in exclusive breastfeeding

# THE RACE TO IMPROVE CHILD SURVIVAL

### Are we making progress?

Progress to improve exclusive breastfeeding has stagnated over the past 15 years. Five out of the seven regions with trend data have current rates around 30 per cent, and all of them have improved very little, if at all, in more than a decade. The rates of exclusive breastfeeding in Latin America and the Caribbean and in East Asia and the Pacific, for example, have remained unchanged since 2000.

Global rates have improved modestly, with change driven almost entirely by South Asia, where exclusive breastfeeding rates increased by 17 percentage points between 2000 and 2015. While this is an important achievement, still fewer than two in three infants benefit from exclusive breastfeeding in the region.

However, regional and global averages can mask progress in individual countries. Over the past few years, some countries have made incredible strides in improving exclusive breastfeeding rates,<sup>11</sup> and these achievements tell us that rapid improvements are possible. Out of the 101 countries with recent data, 32 have already reached the 2025 World Health Assembly (WHA) target of an exclusive breastfeeding rate of at least 50 per cent. This target provides room for countries to be ambitious and not only maintain current achievements, but make further improvements as well.

### Why should we act now?

Advancement on exclusive breastfeeding could provide the foundation to not only achieve SDGs 2 and 3 related to food insecurity, malnutrition and child deaths, but also wider development goals pertaining to education and poverty reduction, among others. To achieve these goals, we need investments from governments at all levels of society to create a more enabling environment for mothers who choose to breastfeed. This

includes arming mothers with the knowledge to make informed decisions, and providing them with the support they need from their families, communities, workplaces and health-care systems to make exclusive breastfeeding for the first six months happen.

Scaling-up of efforts to protect, promote and support exclusive breastfeeding would provide a cost-effective pathway to achieving the SDGs.

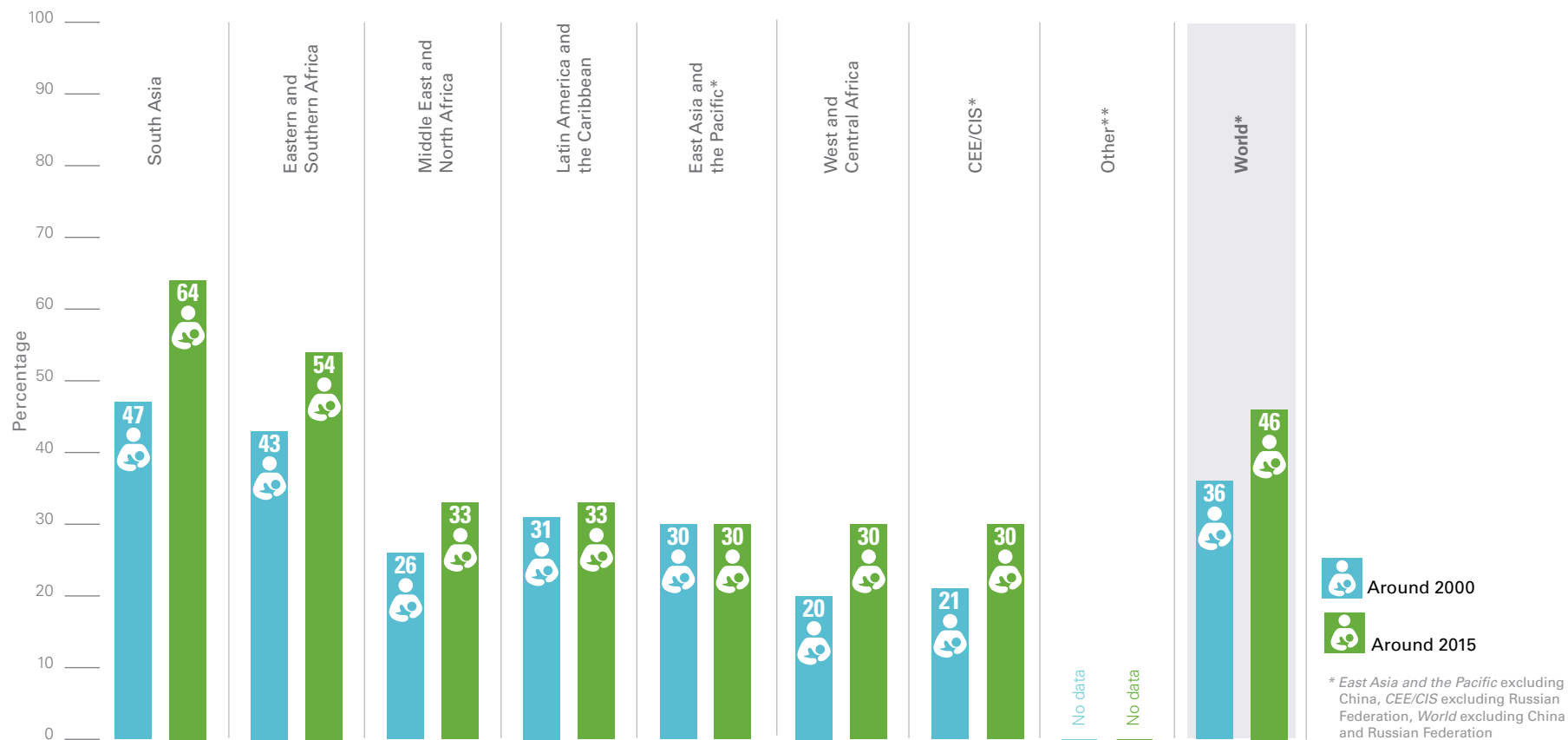
### Breastfeeding with HIV: The facts<sup>12</sup>

A mother's HIV status does not have to stop her from breastfeeding. Mothers living with HIV can breastfeed their infants safely provided they adhere to antiretroviral therapy (ART) from the time of diagnosis throughout the breastfeeding period. Adherence to ART is critical to preventing virus transmission from mother to baby and for the health of the mother.

In resource-limited settings, where safe water and sanitation cannot be assured, and where diseases like pneumonia and diarrhoea are widespread, the benefits of breastfeeding greatly outweigh the risk of HIV transmission. When mothers living with HIV breastfeed for 12 months while adhering to ART, the rate of transmission at the end of that period is reduced to below 5 per cent<sup>13</sup> when compared with a transmission rate of 20–45 per cent without any interventions.<sup>13</sup>

WHO and UNICEF recently updated the guidelines on infant feeding and HIV.<sup>14</sup> The new guidelines clarify that ART is effective at reducing virus transmission even when mothers practice mixed feeding, although exclusive breastfeeding remains the ideal. What's more, mothers living with HIV and taking ART can continue breastfeeding until age 2 and beyond. Regardless of how long a mother with HIV intends to breastfeed, she can be assured that even shorter durations of breastfeeding while on ART are better than never initiating breastfeeding at all.

# South Asia has made the greatest strides in exclusive breastfeeding of all regions



**Trends in per cent of infants aged 0-5 months exclusively breastfed, by region, around 2000 and around 2015**

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

**Notes:** Analysis is based on a subset of 78 countries with comparable trend data covering 68 per cent of the global population (excluding China and Russian Federation) for around 2000 (1997-2003) and 70 per cent for around 2015 (2010-2016). Rates for 2015 may differ from current rates presented elsewhere as trends are based on a subset of countries with baseline data. Regional estimates are presented only where adequate population coverage ( $\geq 50$  per cent) is met.

\*To meet adequate population coverage, East Asia and the Pacific does not include China and CEE/CIS does not include Russian Federation. \*\*Other refers to mainly high-income countries not included within UNICEF programme regions.

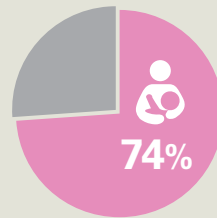


Health extension worker Elsebeth Aklilu takes a break from counselling women and their children on best nutrition practices to breastfeed her own son, Fikir Mekete, at the health post in the village of Maderia, in Gemechis, a woreda (district) of Oromia Region, Ethiopia. ©UNICEF/UNI183051/Nesbitt

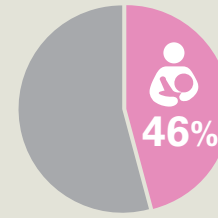


# CONTINUED BREASTFEEDING

Breastfeeding rates **decrease** by about **one third** between 12 and 23 months.



**12-15** months



**20-23** months

*The per cent of children breastfed at 1 year (12-15 months) and 2 years (20-23 months)*

# Continued breastfeeding

## DURATION MATTERS

### What is continued breastfeeding and why does it matter?

Continued breastfeeding refers to the continuation of frequent, on-demand breastfeeding, from the period between 6 months and 2 years of age or beyond <sup>1</sup>. Children should begin eating solid, semi-solid or soft foods starting at 6 months of age. Breastmilk remains a key source of essential fats, proteins and other nutrients during this period, particularly in settings with limited access to a diverse range of foods <sup>1,2</sup>.

Children who are still breastfed after 1 year of age can meet a substantial portion of their energy needs with the breastmilk in their diet. <sup>1</sup> Continued breastfeeding is also vital during illness; while sick children often have little appetite for solid food, continued breastfeeding can help prevent dehydration while also providing the nutrients required for recovery.<sup>3</sup> The disease protection provided by breastfeeding continues throughout the breastfeeding period and is not just for newborns and young infants. Indeed, continued breastfeeding could prevent half of all deaths during the 12–23 month period.<sup>4</sup>

Across all income levels, continued breastfeeding is consistently associated with higher performance in intelligence tests among children and adolescents. This cognitive boost translates into improved educational attainment, increased long-term earnings and better productivity – with those children breastfed longer than 12 months benefiting most from these gains <sup>5</sup>. In high-income countries, longer periods of breastfeeding may reduce a child's risk of overweight and obesity.<sup>4</sup>

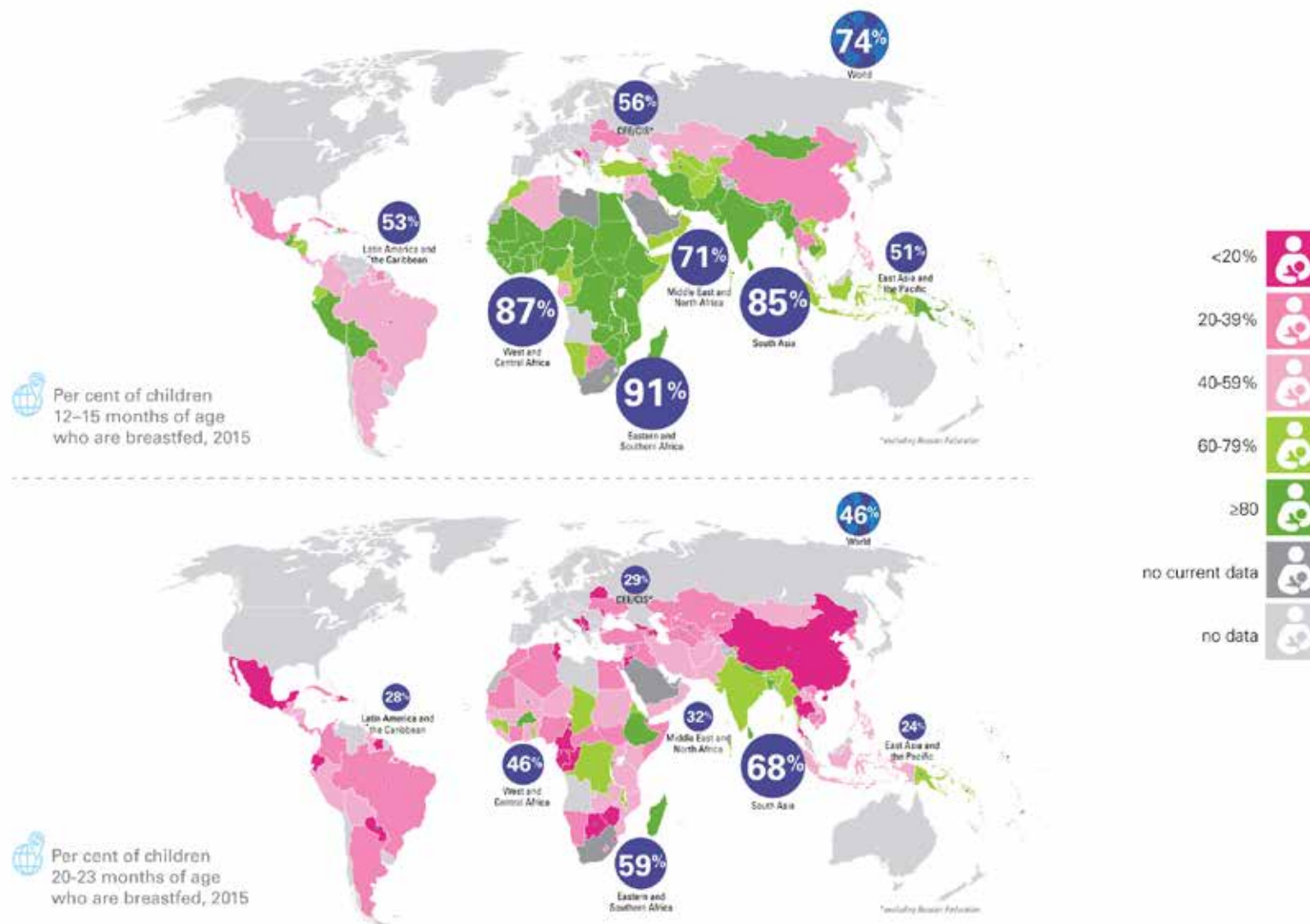
Continued breastfeeding is also important for mothers; for every 12 months of breastfeeding in their lifetime, there is a 6 per cent reduction in the risk of breast cancer.<sup>4</sup> Research also suggests that continued breastfeeding could improve birth spacing and potentially protect against ovarian cancer and type 2 diabetes.

### What do the numbers tell us?

Globally, continued breastfeeding rates drop from 74 per cent at 1 year (for 12–15 month-olds), to 46 per cent at 2 years (for 20–23 month-olds). At all age intervals, rates of continued breastfeeding are highest in Eastern and Southern Africa, West and Central Africa, and South Asia. The highest rates of continued breastfeeding at 2 years are in South Asia, where nearly 70 per cent of these children are still breastfed.

In East Asia and the Pacific, CEE/CIS and Latin America and the Caribbean, only half of all children are still breastfed at 1 year, and continued breastfeeding rates drop to less than 30 per cent in all of these regions at 2 years. While this analysis has no data for the 'other' region (mostly high-income countries outside of UNICEF programme regions), the Lancet 2016 Breastfeeding Series estimates that only one in four children in high-income countries were breastfed at 1 year – a much lower figure than that of all other regions.<sup>4</sup>

## Globally, less than half of children are still breastfed at 2 years



Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016 (\* denotes countries with older data between 2005-2009; data from these countries are not included in the regional aggregates except for China (2008) which is used for the East Asia and the Pacific and World averages). Countries shaded in dark grey have estimates from 2004 or earlier and are thus represented as having "no current data"; these countries are not included in the regional aggregates. \*CEE/CIS does not include Russian Federation. Note: These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

# Continued breastfeeding and household wealth

## BRIDGING THE EQUITY GAP

### Who is benefiting from continued breastfeeding?

Breastfeeding has great potential to reduce inequities. The impacts of continued breastfeeding on disease prevention, IQ, educational attainment and future earning potential can help bring even the poorest children closer to the same starting line as their wealthier peers. <sup>4</sup>

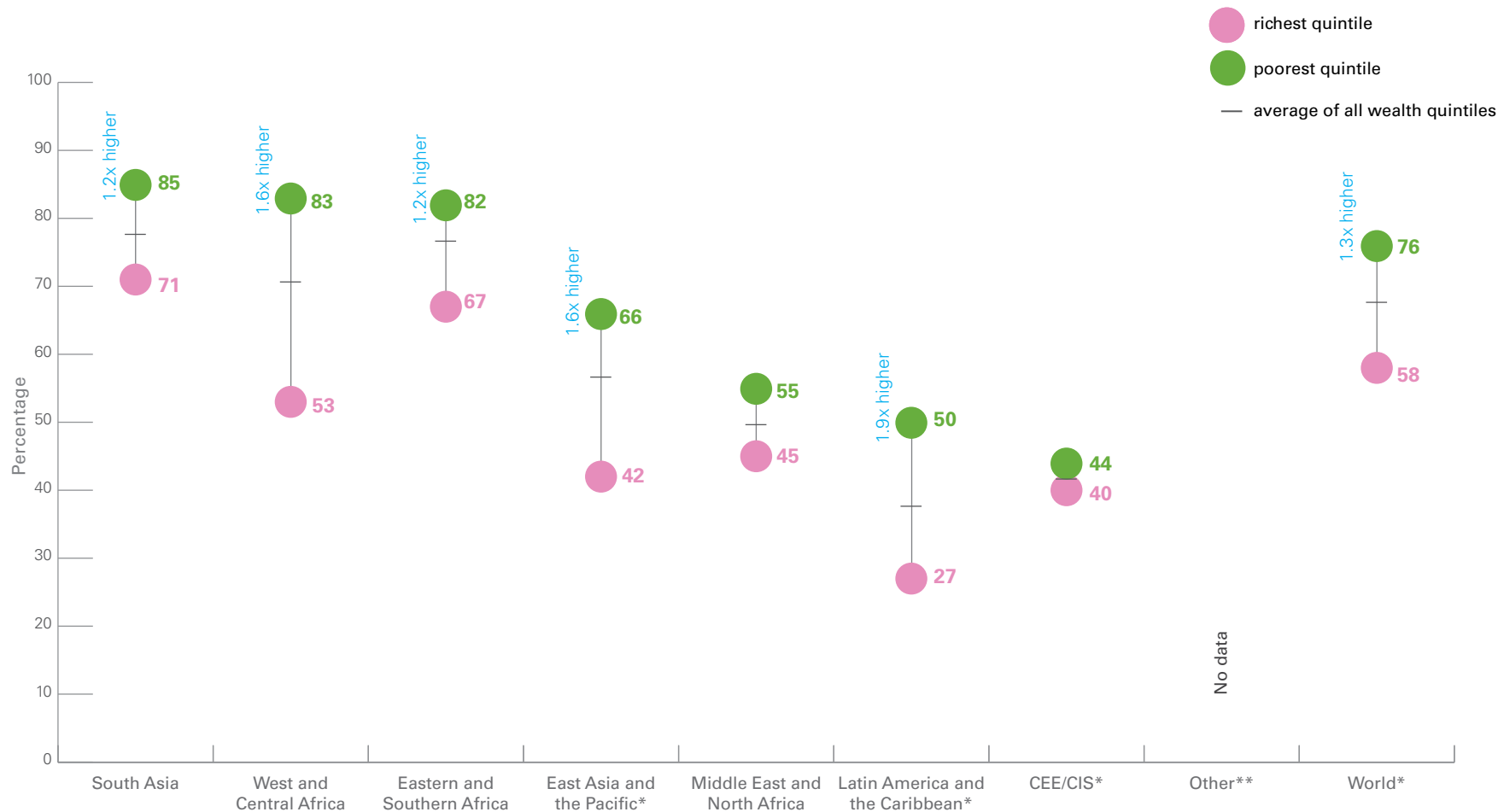
Breastfeeding is one of the few positive health behaviors that is more prevalent in poor than in rich countries; and within low- and middle-income-countries themselves, poor women breastfeed longer than rich women. <sup>4</sup> However, these practices are vulnerable to external influences, such as the breastmilk substitutes industry, which is always searching for ways to expand its reach and penetrate new markets. <sup>6</sup> This means that protecting breastfeeding from commercial influences should be a priority, particularly in the world's poorest places. <sup>4</sup>

The lower cognitive ability associated with not breastfeeding has economic costs. Globally, these losses are estimated at about \$300 billion annually. High-income countries lose more than \$230 billion annually due to low rates of breastfeeding, while low- and middle-income countries lose more than \$70 billion annually. <sup>7</sup>

### What do the numbers tell us?

Across nearly all regions, more women from the poorest households continue to breastfeed after the first year of life when compared with women from the wealthiest households. This is particularly true in Latin America and the Caribbean, where the continued breastfeeding rate among women in the poorest households is nearly double that of their wealthier counterparts. Similarly, in West and Central Africa and East Asia and the Pacific, the rates among women from the poorest quintile are 1.6 times higher than women in the richest quintile. The difference between richest and poorest is negligible among countries studied in CEE/CIS.

# Continued breastfeeding rates are highest among women from the poorest households



**Per cent of children age 12–23 months that are breastfed, by wealth quintile and region, 2015**

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

**Note:** Analysis is based on a subset of 74 countries with recent (2010–2014) disaggregated data for continued breastfeeding at 12–23 months covering 76 per cent of the global population (excluding China and Russian Federation). Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China, Latin America and the Caribbean does not include Brazil, and CEE/CIS does not include Russian Federation. \*\*Other refers to mainly high income countries not included within UNICEF programme regions.

\*East Asia and the Pacific excluding China, Latin America and the Caribbean excluding Brazil, CEE/CIS excluding Russian Federation, World excluding China, Brazil and Russian Federation

## Continued breastfeeding trends

# EXTENDING THE BENEFITS THROUGH EARLY CHILDHOOD

### Are we making progress?

The continued breastfeeding rate at 2 years has remained relatively unchanged since 2000. The only region to see an increase in continued breastfeeding over the 15-year period was CEE/CIS; and even with these gains only a third of children aged 20–23 months are currently breastfed.

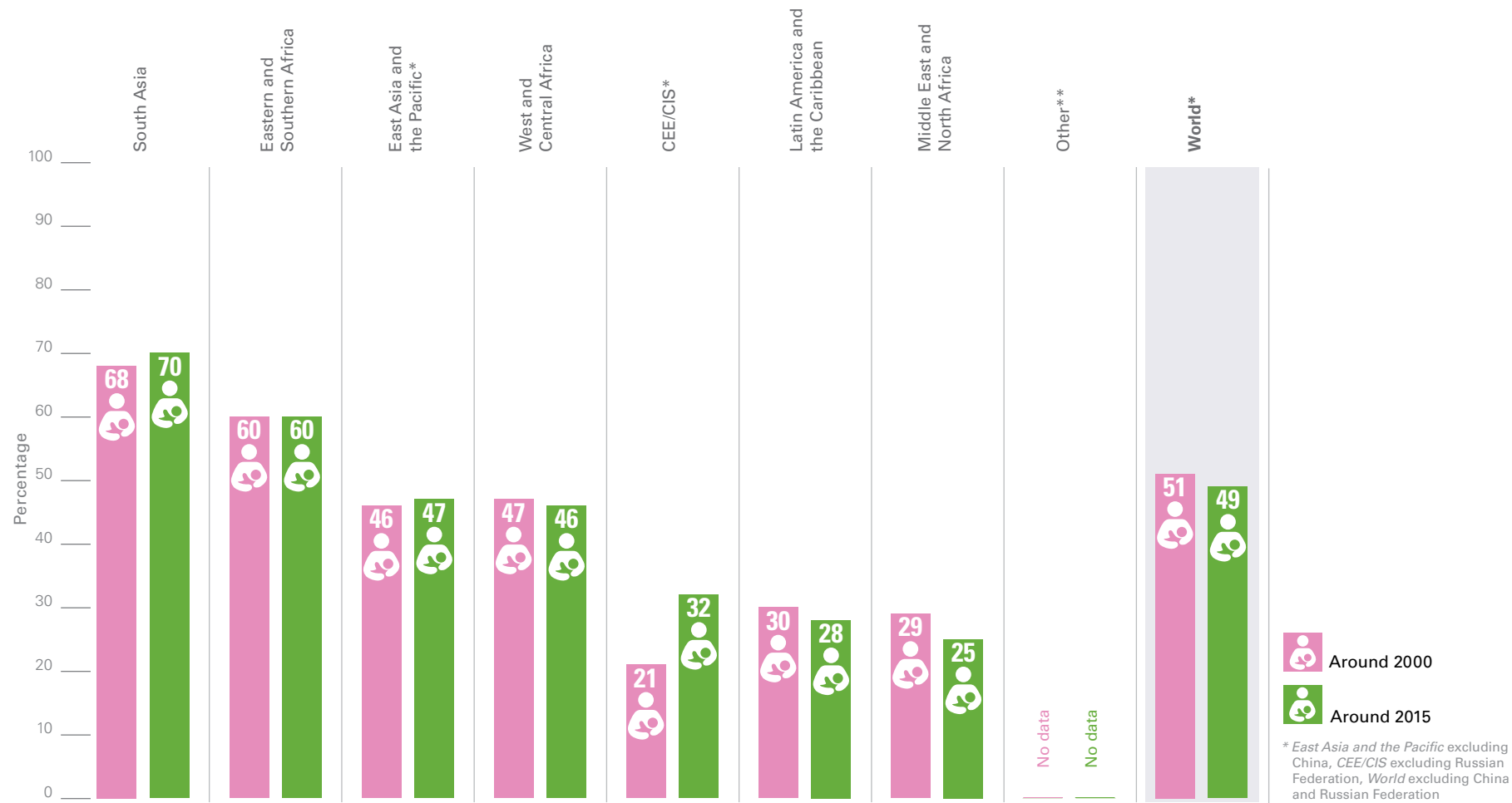
While South Asia has the highest rates for continued breastfeeding at 2 years, there has been no progress over the past 15 years. A similar trend analysis for continued breastfeeding at 1 year (not presented here) also revealed little to no progress, with only CEE/CIS showing a modest increase of 10 percentage points over the same period.

### Why should we act now?

Both rich and poor countries have a lot to gain from better rates of continued breastfeeding. With its impact on school performance, potential earnings and productivity, continued breastfeeding could contribute to the achievement of many SDG targets – including those related to ending poverty, promoting lifelong learning, improving economic growth and building inclusive societies.

Without concerted international attention, however, continued breastfeeding rates will not improve and may even decrease as time goes on. As income levels rise around the world, there is a risk that rates of continued breastfeeding in poor countries may begin to resemble the low rates in more industrialized countries.<sup>4</sup> The ever-expanding reach of the breastmilk substitutes industry has the potential to erode continued breastfeeding practices, even in places where they are the most established.<sup>8</sup> The proliferation of follow-up formulas and growing up milks marketed for children in the 6-23 month old range is a troubling trend, and better efforts are needed to ensure that the promotion of such products is prohibited by national legislation.

# Continued breastfeeding rates have remained stagnant for over a decade



Trends in per cent of children aged 20-23 months who are breastfed, by region, around 2000 and around 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

Notes: Analysis is based on a subset of 79 countries with comparable trend data covering 70 per cent of the global population (excluding China and Russian Federation) for around 2000 (1997-2003); and 71 per cent of the global population for around 2015 (2010-2016). Rates for 2015 may differ from current rates presented elsewhere as trends are based on a subset of countries with baseline data. Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China and CEE/CIS does not include Russian Federation. \*\*Other refers to mainly high income countries not included within UNICEF programme regions.

# The International Code of Marketing of Breastmilk Substitutes

## PROTECTING BREASTFEEDING WITH POLICY

### How does the Code protect and promote breastfeeding?

The International Code of Marketing of Breastmilk Substitutes, adopted by the WHA in May 1981, and subsequent relevant WHA resolutions (known together as 'the Code') aim to protect and promote breastfeeding by prohibiting the promotion of breastmilk substitutes, including infant formula, bottles, teats, follow-up formulas and growing-up milks marketed for feeding infants and young children up to the age of 3 years. By integrating the Code's provisions into national legislation, governments can help protect mothers and health-care workers from the commercial pressures that seek to undermine breastfeeding.

While adopting the Code's provisions into enforceable legal measures is vital at the national level, the promotion of breastmilk substitutes remains widespread even in some countries where the Code is reflected in national law.<sup>1</sup> Monitoring and enforcement mechanisms are thus critical to ensuring that legislation is fully implemented in practice.

The breastmilk substitutes industry uses aggressive marketing tactics to target pregnant women, new mothers and health workers.<sup>1</sup> Such promotion often includes false claims that formula is equal or superior to breastfeeding,

can improve digestive problems, or will ensure that babies sleep through the night – all of which erode women's confidence in breastfeeding.<sup>2</sup> These unethical practices negatively impact breastfeeding outcomes, particularly when promoted by health workers.<sup>1</sup> For example, hospital discharge packages containing infant formula have been shown to negatively impact exclusive breastfeeding.<sup>3</sup> Other evidence suggests that mothers who do not receive infant formula at discharge are 58 per cent more likely to exclusively breastfeed.<sup>4</sup>

We are fighting an uphill battle against a powerful and well-funded machine, with an increasingly wide reach. Estimates suggest that the global infant formula market will be worth \$71 billion by 2019, with the highest growth expected in the Middle East, Africa and the Asia-Pacific regions.<sup>5</sup> The immense budget and influence of the industry sits in stark contrast to the limited investments made in national breastfeeding policies and programmes<sup>1,6</sup> – and this urgently needs to change.

### What do the numbers tell us?

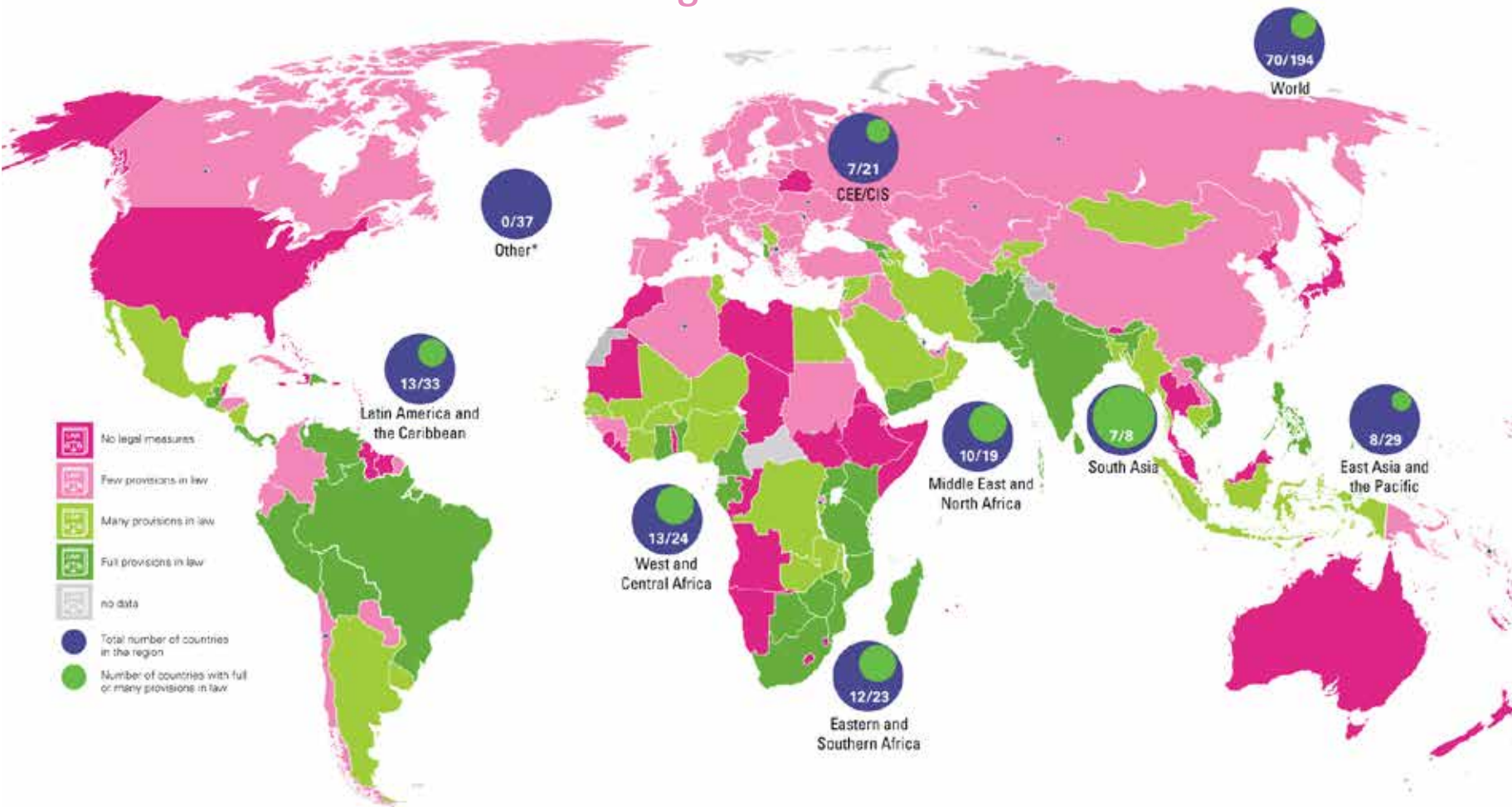
Globally, there are 135 countries with some Code provisions in place. However, the strength and comprehensiveness of these measures vary widely across countries. The map presented here distinguishes between the number of countries with legislation reflecting


the Code's *full* legal measures and *many* of its measures (noted in shades of green), versus countries with legislation reflecting only a *few* legal measures or *none* at all (noted in shades of pink).

The status of Code adoption and implementation also varies by region. In South Asia, seven out of eight countries have laws in place reflecting all or many of the Code's provisions, while more than half of all countries in Latin America and the Caribbean, CEE/CIS, East Asia and the Pacific, and the 'other' region have minimal or no legislation. Indeed, in the 'other' region – which is composed of high-income countries outside of UNICEF's programming – not a single country has adopted all or many of the Code's measures into legislation. The limited evidence we have suggests that breastfeeding rates are extremely low in these countries<sup>7</sup> and better Code legislation would be a critical step towards creating a more favourable environment for breastfeeding.<sup>1</sup>



# 135 countries have some legal measures in line with the Code – yet most of these need to be further strengthened



 Status of national measures on the International Code of Marketing of Breastmilk Substitutes and subsequent relevant World Health Assembly resolutions, by country and by region\*, 2016

**Source:** WHO, UNICEF, IBFAN. Marketing of Breast-milk Substitutes: National Implementation of the International Code. Status Report 2016. Geneva: World Health Organization; 2016. (• denotes countries have no dedicated Code legislation, but have Code-related provisions incorporated in other legal measures.). The regional summaries indicate the number of countries with a full provision or many provision law (green circle) out of all countries in the region (blue circle). \*Other refers to mainly high income countries not included within UNICEF programme regions (see annex 2). *Note:* These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.



Young lactating mothers and mothers with infants are checked and encouraged to breastfeed at home and give complementary food to their infants beyond six months of age. A house to house monitoring is done by the local Auxillary Nurse Midwife (ANM) to ensure this practice.

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# THE WAY FORWARD FOR BREASTFEEDING

# THE WAY FORWARD

## What do we need to do better?

Breastfeeding is not a one-woman job: the support of families, communities, workplaces and the health system – backed by sound investments from governments – is needed to make it work in all settings, including in humanitarian contexts.

Government leadership and investments in protective policies and legislation, support for skilled health-care workers, and community engagement are the foundations for obtaining better breastfeeding rates. These investments are the keys to building an enabling environment where women who choose to breastfeed can do so with the support they need at all levels.

## Government support

National legislation is needed to **ban the unethical promotion of breastmilk substitutes**, including false claims by producers that their products are equal or superior to breastmilk. To achieve this, countries should adopt the **International Code of Marketing of Breastmilk Substitutes and subsequent relevant WHA resolutions** (the Code) into national laws and policies.

To adequately enforce the Code, governments should establish a **monitoring body** with the power to institute punitive measures, such as penalties for non-compliance. This body should

be independent, transparent and free from commercial influence.<sup>1</sup>

Given the many challenges that countries face in adopting and monitoring Code legislation, WHO and UNICEF established Network for the Global Monitoring and Support for Implementation of the International Code of Marketing of Breast-milk Substitutes and subsequent WHA resolutions<sup>2</sup> (NetCode), with the aim of strengthening the capacities of governments and civil society to monitor and implement the Code. Governments can **seek technical assistance from NetCode** actors, and use monitoring protocols to identify obstacles and solutions to full Code implementation.

During **emergencies**, the unmonitored and uncontrolled distribution of breastmilk substitutes (including infant formula) as well as the breakdown of the systems that support breastfeeding mothers pose additional threats to breastfeeding. At the same time, some infants have no possibility of breastfeeding, and therefore breastmilk substitutes are the only option for them. Policies and strategies, as well as human resources and adequate services in other sectors, such as water and sanitation, need to be put into place to protect children's lives.

Countries should enact family leave and workplace breastfeeding policies, which at least minimally conform to the **International**

**Labour Organization's maternity protection guidelines**, including provisions for the informal sector. Paid breaks guaranteed for at least six months were associated with an 8.9 percentage point increase in exclusive breastfeeding in some countries.<sup>3</sup>

Interventions supporting breastfeeding-related policies and strategies need to be **adequately financed** and prioritized.

Governments around the world have committed to achieving the WHA Nutrition targets, including the one on exclusive breastfeeding, by 2025. Unless progress is monitored regularly, governments cannot achieve what they have promised. If not already in place, mechanisms to allow for the **regular reporting on standard breastfeeding indicators** need to be established.

## Health system support

Mothers need adequate **prenatal counselling and education on breastfeeding** and infant care in the lead-up to birth. Research shows that harmful practices – such as feeding anything other than breastmilk before infants are put to the breast – decline when caregivers are aware of the risks.<sup>4</sup>

Whether birth takes place in a home, health centre or hospital, improved maternal health-care coverage and **quality lactation counselling**

**and support after delivery** are crucial to improving early initiation rates. Given that the vast majority of births are now delivered by skilled attendants,<sup>5</sup> there are clear opportunities to better leverage their skills to improve early initiation. For this to happen, doctors, nurses and midwives need to be trained to provide breastfeeding support, and early initiation of breastfeeding must be framed as the last phase in the reproductive cycle and part of the natural sequence of events following birth.

There is a need to better institutionalize the protection, promotion and support for breastfeeding in maternity facilities, including via strengthening the Ten Steps of the WHO/ UNICEF **Baby-friendly Hospital Initiative** (BFHI). BFHI's *Ten Steps to Successful Breastfeeding* include baby-friendly hospital policies, capacity building of staff and key practices like supporting early initiation of breastfeeding, not providing any other foods or liquids, allowing 'rooming in' of mother and baby and referring mothers to support structures upon discharge. Baby-friendly hospitals abide by the Code and monitor their practices regularly. Implementing the Ten Steps package has proven to lead to improved breastfeeding outcomes.<sup>6</sup>

Implementation of the Ten Steps also helps to **dissuade non-evidence based practices** – such as the routine separation of mother and baby and the supplementation of healthy

newborns with infant formula – and facilitates mothers and their babies getting an early start to breastfeeding. The rise in Caesarean deliveries, for example, contributes to poor initiation rates in many countries;<sup>7</sup> however, with the right support, even most newborns delivered by Caesarean section can be put to the breast within the first hour of life.

Health service breakdowns are common in emergencies and compromise the health and well-being of mothers and children. It is essential for governments to invest in risk-informed health systems that can adapt effectively to humanitarian contexts.

### **Workplace support**

The employers of the millions of women worldwide working in formal labour markets need to adequately implement protective policies like **maternity leave** and provide **space and time for nursing breaks** to ensure that breastfeeding and work are not mutually exclusive. Those in the informal economy need additional support from families and communities to manage the demands of work while breastfeeding.

### **Family and community support**

National policy makers must identify the **social and cultural factors** that influence breastfeeding practices from birth up to 2 years of age and beyond, and address them with

targeted behaviour change communication strategies and programming adapted to different contexts and relevant target groups, including community leaders, the baby's father and grandparents, as well as the mother herself.

Being a child's sole food source for six months requires an important time investment from mothers. Family and community **support and encouragement** can help make this commitment easier for women by being supportive of their decisions and assisting with household and family responsibilities, such as the preparation of family meals, household chores and the care of older children. Family based counselling, involving fathers and other relatives, is an important opportunity to address gender roles and educate these other family members on how to best support mothers who choose to breastfeed. In addition, adolescent girls and boys need education on life skills including future parenting and the importance of infant care and feeding practices.

Within communities, women-to-women support groups and other **forms of social support** are valuable opportunities for breastfeeding mothers to share experiences and overcome challenges in a supportive environment and their establishment should be encouraged. Additional measures are required during emergencies, when community support systems and health services may be compromised or inaccessible.





PART II

## **Focus on Complementary Feeding**

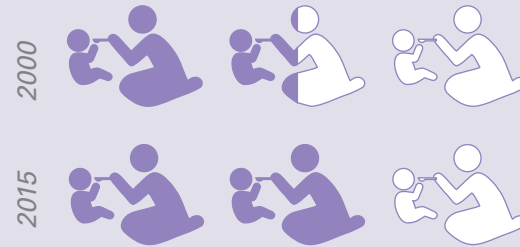


Young lactating mothers and mothers with infants are checked and encouraged to breastfeed at home and give complementary food to their infants beyond six months of age. A house-to-house monitoring is done by the local Auxillary Nurse Midwife (ANM) to ensure this practice in Andhra Pradesh .  
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# INTRODUCTION TO SOLID, SEMI-SOLID OR SOFT FOODS

More infants are being fed solid foods at the recommended age than in the year 2000 – but **one third** are still waiting too long for their first bites.



*Only about half of infants 6-8 months of age were fed solid, semi-solid or soft foods in 2000, compared to two-thirds in 2015.*

## Introduction to solid, semi-solid or soft foods

# THE CRITICAL WINDOW FOR AN INFANT'S FIRST BITES

### Why is it important to introduce solid foods at 6 months of age?

As infants grow, their nutrient needs grow with them. After the first six months of life, an infant's nutrient demands start to exceed what breastmilk alone can provide.<sup>1,2</sup> To keep up with these growing demands, WHO recommends that infants begin eating solid, semi-solid or soft foods at 6 months of age to ensure that their nutrient intake is sufficient to fuel their developing brains and bodies (*for the sake of brevity, solid, semi-solid and soft foods will be referred to as 'solid foods' throughout the rest of this report*).<sup>2</sup> These solids foods should be safe, nutritious and ideally provided in addition to breastmilk from 6 to 23 months of age.<sup>1-3</sup>

In low- and middle-income countries, a substantial amount of growth faltering occurs between 6 and 23 months of age,<sup>4</sup> and the evidence is clear that an inadequate diet during this period increases the risk of stunting and micronutrient deficiencies.<sup>5</sup> It is therefore critical that infants are introduced to their first foods on time, at 6 months of age. Introducing foods too late deprives children of the vital nutrients their bodies demand and leaves them vulnerable to malnutrition. In contrast, an analysis of 14 countries found that children 6–8 months old who eat solid foods have a lower risk of both stunting and underweight; among all feeding indicators studied in this analysis, consumption of solids at 6–8 months was the indicator most closely related to stunting outcomes.<sup>6</sup>

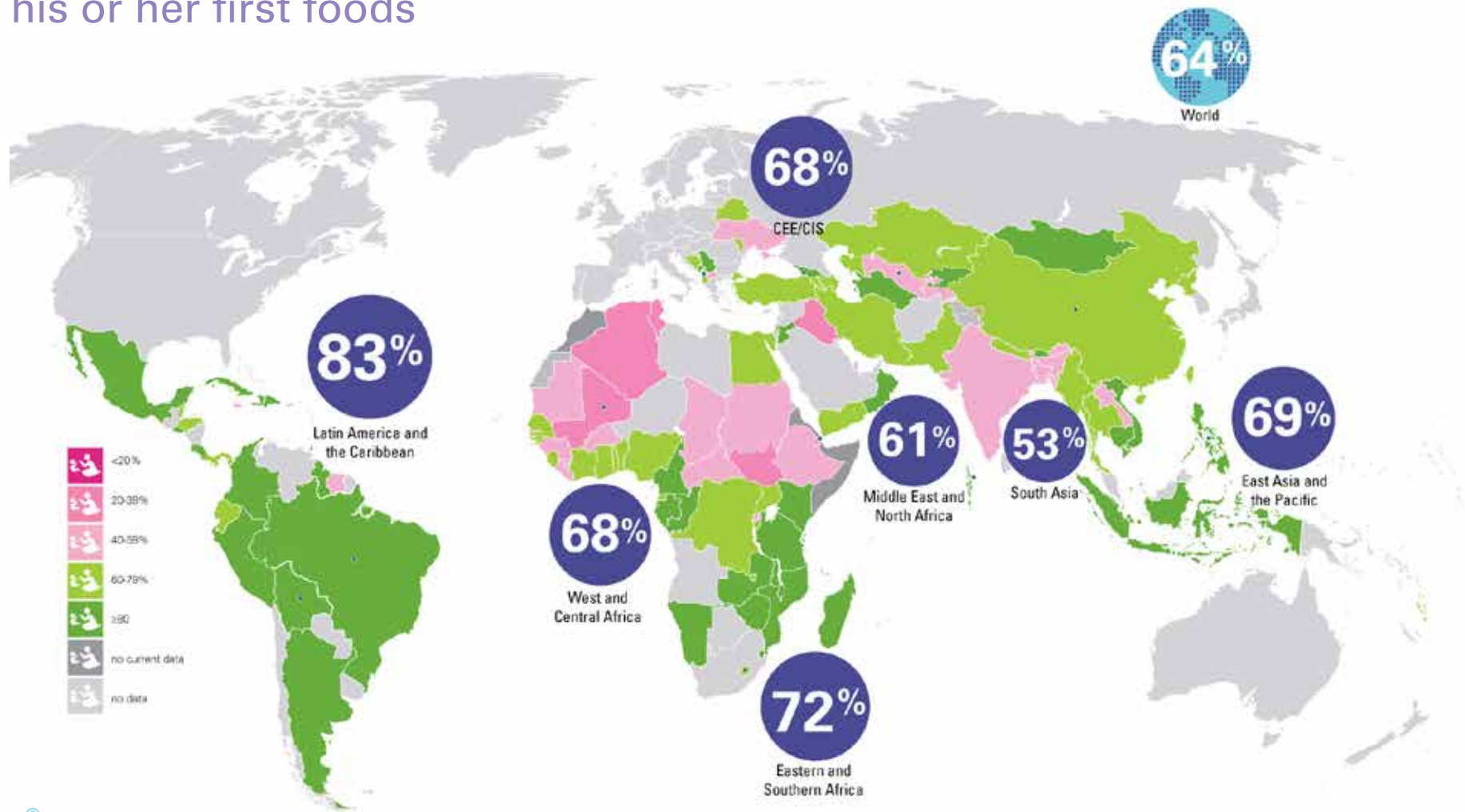
### What do the numbers tell us?


While it is recommended that infants start eating solid foods at 6 months, globally, about one third of infants 6–8 months old are not yet eating solid foods, posing a threat to their growth and development. The situation is most troubling in South Asia, where about half of infants are being introduced to solid foods too late.

In contrast, in Latin America and the Caribbean, more than 80 per cent of infants 6–8 months old are eating solid foods. While these numbers are encouraging, they should be interpreted with caution, given that this indicator does not reflect how many of these infants received their first foods before the recommended age of 6 months.

The introduction of foods at 6 months of age ideally complements an already breastmilk-based diet. However, it should be noted that the estimates presented here only assess whether infants 6–8 months old are receiving solid foods; they do not take into account the breastfeeding status of the infant.

# One out of every three infants is waiting too long for his or her first foods



 Per cent of infants 6-8 months of age fed solid, semi-solid or soft foods, 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016 (\* denotes countries with older data between 2005-2009; data from these countries are not included in the regional aggregates except for China (2008) which is used for the East Asia and the Pacific and World averages). *Note:* These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

# Introduction to solid, semi-solid or soft foods

## GETTING THE TIMING RIGHT

### Why wait until 6 months of age?

Across rich and poor countries alike, many parents introduce their children to solid foods before the recommended age of 6 months, and often as early as 3 or 4 months of age.<sup>7-10</sup> However, there is no added benefit to this practice; evidence suggests that these early foods provide no growth advantage over exclusive breastfeeding.<sup>11</sup> Instead, introducing solid foods too early may increase infants' exposure to pathogens and result in early weaning, depriving the child of the critical benefits of breastmilk up to 6 months of age and beyond.<sup>1,2</sup> The evidence is clear that exclusive breastfeeding provides all of the nutrients infants need to grow and thrive during their first six months of life. There is also some evidence to suggest that introducing solid foods very early (at or before 4 months) may increase the risk of becoming overweight in childhood.<sup>12</sup>

Despite these facts, there is a common misconception that breastmilk alone is not sufficient to meet an infant's needs for the full six months, owing to the child's size, appetite, or rate of growth.<sup>13</sup> Caregivers often introduce solid foods early because they believe the child is showing signs of hunger when they chew on their fingers or put objects in their mouths,<sup>7,8</sup> and boys in particular may be introduced to solid foods earlier than girls because their feeding demands are perceived to be greater.<sup>8,10</sup> Mothers also report giving solid foods before 6 months of age in the hope that it will help their infants sleep through the night.<sup>7,9</sup>

Various cultural and socio-economic factors also influence the decision to introduce solid foods before the age of 6 months, including traditional practices, caregivers' work demands, family pressures, commercial advertising and inadequate advice from health-care providers.<sup>7,13</sup>

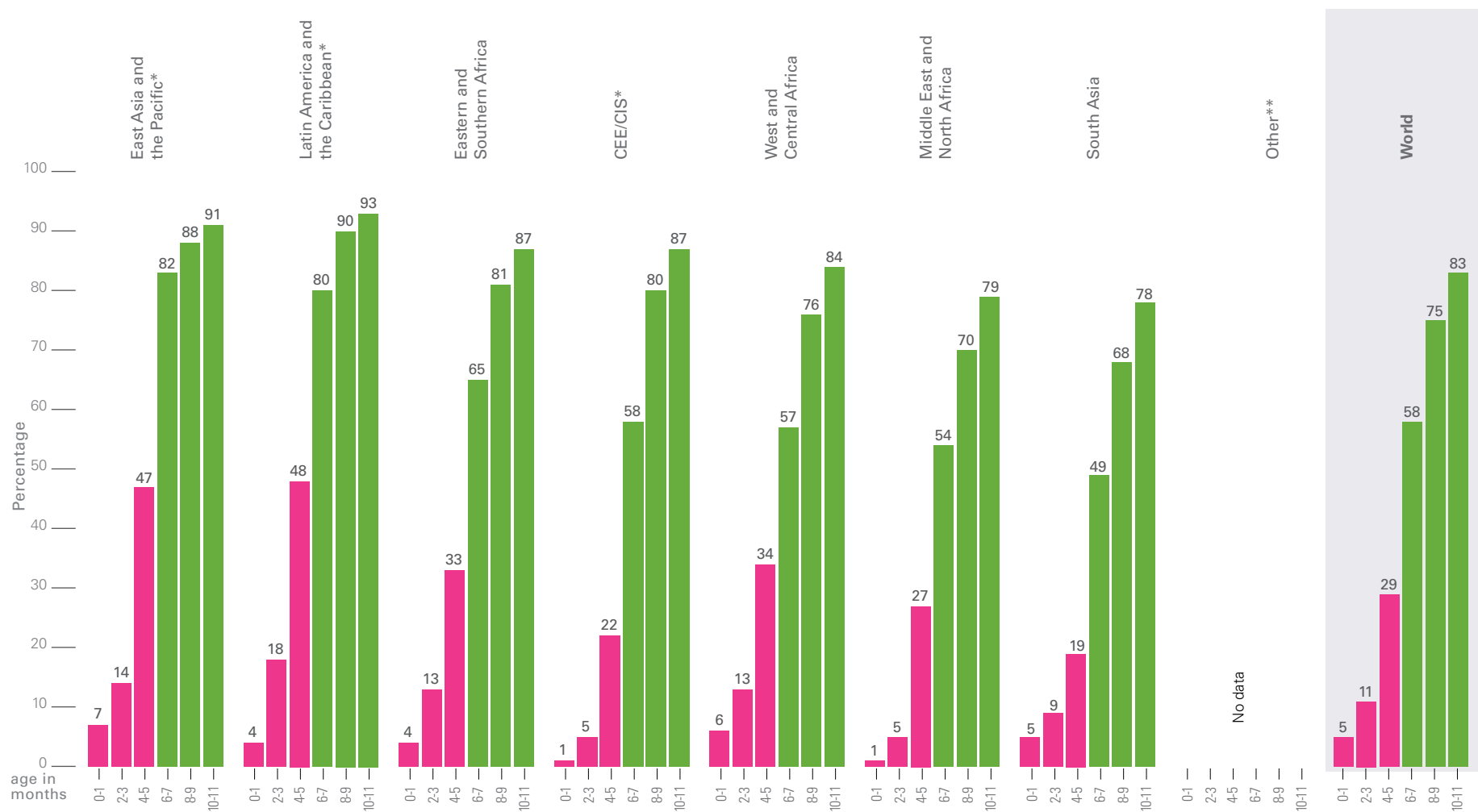
### What do the numbers tell us?

An analysis on consumption of solid foods in the first full year of life – with results displayed by 2-month age intervals – found that, globally, more than one quarter of infants between 4 and 5 months of age are already consuming solid foods. Across all regions, a concerning number of infants are also already consuming solid foods between 0 and 3 months of age.

While approximately 80 per cent of all infants in Latin America and the Caribbean and East Asia and the Pacific are eating foods at 6 to 7 months, far too many are introduced to their first foods before 6 months of age.

Globally, one out of every four infants aged 8–9 months and nearly one in every five of those aged 10–11 months are still *not receiving* any solid foods. It is worrying that even at this late stage, far too many children have not yet been introduced to their first solid foods, jeopardizing their development and putting them at risk for undernutrition.

# More than one-third of infants are receiving their first foods too early



Introduction to solid, semi-solid or soft foods



**Per cent of children fed solid, semi-solid or soft foods, by age and by region, 2015**

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.

**Notes:** Analysis is based on a subset of 79 countries with data on feeding of solids between 2010-2014 for all age groups, covering 74 per cent of the global population excluding China and Russian Federation. Regional estimates are presented only where adequate population coverage (> 50 per cent) is met. \* To meet adequate population coverage, East Asia and the Pacific does not include China, Latin America and the Caribbean does not include Brazil, CEE/CIS does not include Russian Federation and World does not include China and Russian Federation. \*\* Other refers to mainly high-income countries not included within UNICEF programme regions.

# Trends in the introduction of solid, semi-solid or soft foods

## REDUCING THE WAIT

### Are we making progress?

Fewer infants are waiting too long for their first foods today than they were 15 years ago. An analysis of 39 countries with trend data on the consumption of solid foods among infants 6–8-months old shows that the proportion of infants in this age group eating solid foods has improved in most regions since 2000, but far too many infants are still introduced to solid foods too late.

In Eastern and Southern Africa and CEE/CIS, the proportion of infants consuming solid foods at the recommended time has improved by roughly 20 percentage points in the past 15 years. South Asia has also made notable progress, but nearly half of all infants are still not receiving solid foods early enough.

There has been no notable change in the rates of infants receiving solid foods at 6–8 months of age in West and Central Africa for the past 15 years, despite the need for further improvement.

### Why should we act now?

The physical and mental damage caused by stunting is irreversible. Stunting impairs children's brain development, diminishing their learning and school performance and lowering their future earning potential.

Introducing solid foods at the right time is an important step towards preventing stunting and other forms of malnutrition during this vulnerable period.

Greater progress on introducing solid foods at the right time will help drive the achievement of the WHA nutrition target of a 40 per cent reduction in stunting by 2025, and SDG Goal 2 on ending malnutrition. At the same time, the timely introduction of solid foods at 6 months of age could also contribute to achievement of the WHA target of no increase in childhood overweight. The failure to act on the substantial number of children consuming foods *too early* will also block progress towards achieving the WHA target on exclusive breastfeeding.

# More children are eating their first foods at the right time today than in 2000 – but far too many children are still left waiting for their first bites



**Trends in per cent of infants aged 6-8 months fed solid, semi-solid or soft foods, by region, around 2000 and around 2015**

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.  
 Note: Analysis is based on a subset of 39 countries with comparable trend data covering 60 per cent of the global population for around 2000 (1997-2003); and 60 per cent of the global population for around 2015 (2010-2016) excluding China and Russian Federation. Rates around 2015 may differ from current rates presented elsewhere as trends are based on a subset of countries with baseline data. Regional estimates are presented only where adequate population coverage (≥50 per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China and Latin America and the Caribbean does not include Brazil. \*\*Other refers to countries outside of the UNICEF programme regions; representing mainly high-income countries not included within UNICEF programme regions.

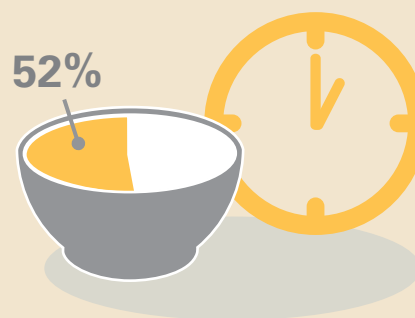


A mother, 31, feeds her daughter, 11 months of age, rice at the Bolgatanga Nutrition and Rehabilitation center in Bolgatanga, Ghana. © UNICEF/UNI191997/Asselin



# MINIMUM MEAL FREQUENCY

**Only half** of children 6 to 23 months of age are fed the minimum number of meals a day for their age.



*The per cent of children 6-23 months of age who were fed meals/snacks the minimum number of times or more.*

# Minimum meal frequency

## EVERY BITE COUNTS

### Why does meal frequency matter?

Infants and children may be the youngest members of their families – but proportionally, their nutrient needs are the greatest. In fact, the nutritional needs for growth and development in children 6-23 months of age are greater per kilogram of body weight than at any other time in life.

Because infants and young children have such tiny stomachs, they can only consume small amounts of food with each feeding. This means that they need to eat *frequently* throughout the day to meet their energy and nutrient needs. To meet the minimum meal frequency as defined by WHO, breastfed children aged 6-8 months need to eat at least two meals or snacks a day, and those 9-23 months of age need to eat at least three meals or snacks a day. Non-breastfed children need to eat more frequently: at least four times a day from 6 months of age.<sup>1</sup>

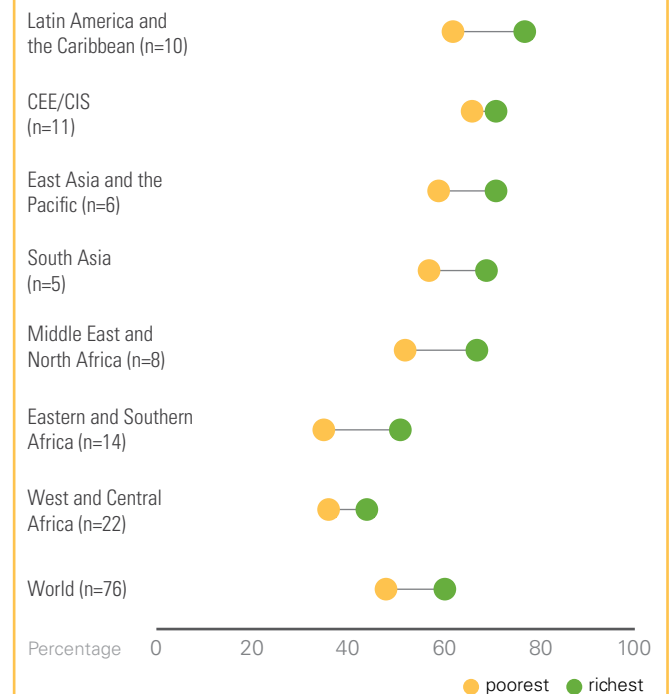
Without enough healthy meals throughout the day, a child's growth and development will suffer. Infrequent meals can cause growth faltering, stunting and micronutrient deficiencies, all of which compromise brain development and can leave children's immune systems vulnerable to infections. In one study from India, the odds of stunting were >60% higher in children 6-23 months old who were not fed the minimum number of times per day.<sup>2</sup>

### What do the numbers tell us?

Half of all children aged 6-23 months are not being fed the minimum number of times a day during this critical period for growth and development. The three regions where stunting rates are highest, namely South Asia, West and Central Africa and Eastern and Southern Africa, have the lowest rates of all. While rates in Latin America and the Caribbean and East Asia and the Pacific are encouraging, approximately a quarter of infants and young children in these regions are not getting even the minimum number of meals or snacks their growing bodies need.

Gaps exist between richest and poorest as noted in the equity graph to the right, which presents an illustrative example of how these gaps vary between regions. In the poorest households in Eastern and Southern Africa, only a third of children are receiving the minimum number of meals. However, even in the richest households, in all regions, far too many infants and young children are not being fed even the minimum number of meals/snacks.

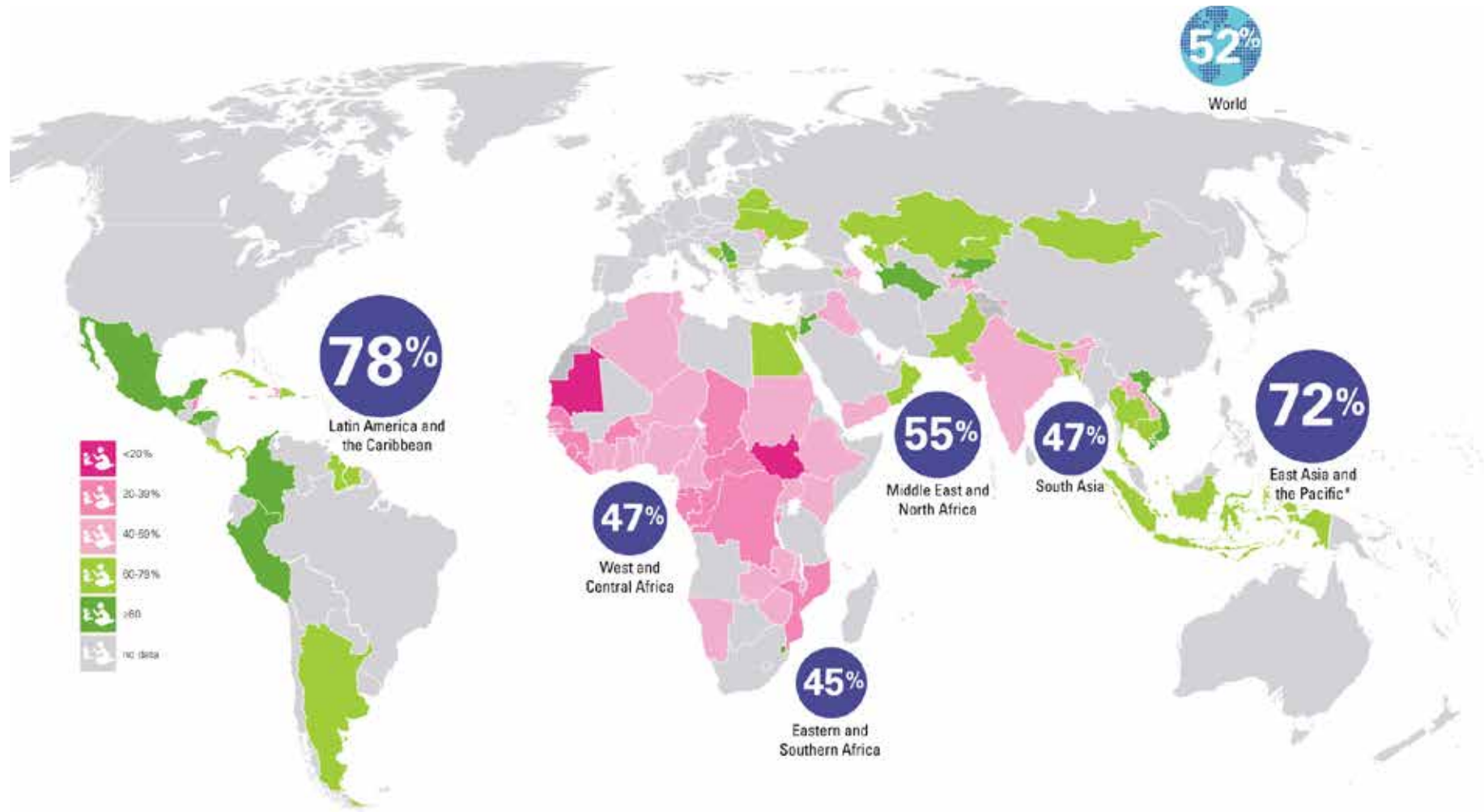
### Globally, even in the richest households, far too few receive a minimum meal frequency




Percentage (unweighted) of children aged 6-23 months with minimum meal frequency, by wealth quintile and region, 2015

Source: UNICEF global databases, 2016 based on MICS, DHS and other nationally representative sources. Note: Analysis is based on a subset of 76 countries with disaggregated data representing 59 per cent of the global population. While other graphs in this report present population weighted averages, unweighted means are presented for this graph due to low population coverage for two regions. As such these figures should be interpreted as illustrative values rather than representing these regions or the world as a whole.

# Half of all children are not receiving a minimum meal frequency



 Per cent of children 6-23 months of age with minimum meal frequency, 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016.

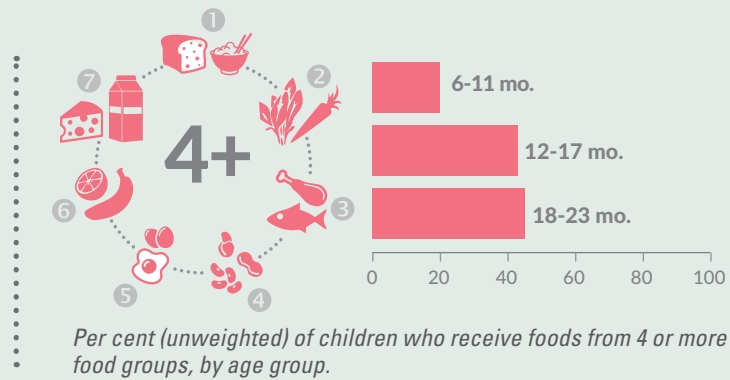
Note: Regional estimates are presented only where adequate population coverage ( $\geq 50$  per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China. These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.



A mother holds her child while eating a slice of watermelon in Niamey the capital of Niger. © UNICEF/UNI116106/Pirozzi

# MINIMUM DIET DIVERSITY

Minimum diet diversity is **lowest** among the **youngest children** – the age group for whom it is most critical.



## Minimum diet diversity

# WHEN FULL BELLIES ARE NOT ENOUGH

### Why does dietary diversity matter?

Food must do more than fill a child's belly; it must contain the vitamins, minerals and nutrients to help children grow and develop, stay healthy and reach their full potential. Children living on monotonous diets of staple grains may go to sleep each night with a full stomach, but their bodies are still hungry for the nutrition that only a diverse range of foods can provide.

To provide just the minimum level of diversity, as defined by WHO, children aged 6–23 months should eat food from at least four of the following food groups a day: grains, roots and tubers; legumes and nuts; dairy products; meats and fish; eggs; vitamin-A rich fruits and vegetables; and other fruits and vegetables.<sup>1</sup>

Evidence has shown that a diet comprising at least four food groups a day is associated with improved growth in young children.<sup>2</sup> A diet lacking in diversity can increase the risk for micronutrient deficiencies, which take a devastating toll on children's brains and bodies. While there are no global estimates for micronutrient deficiencies in children under 2 years of age, it has been estimated that 29 per cent of preschool children suffer from vitamin A deficiency,<sup>3</sup> and 43 per cent from anaemia.<sup>4</sup>

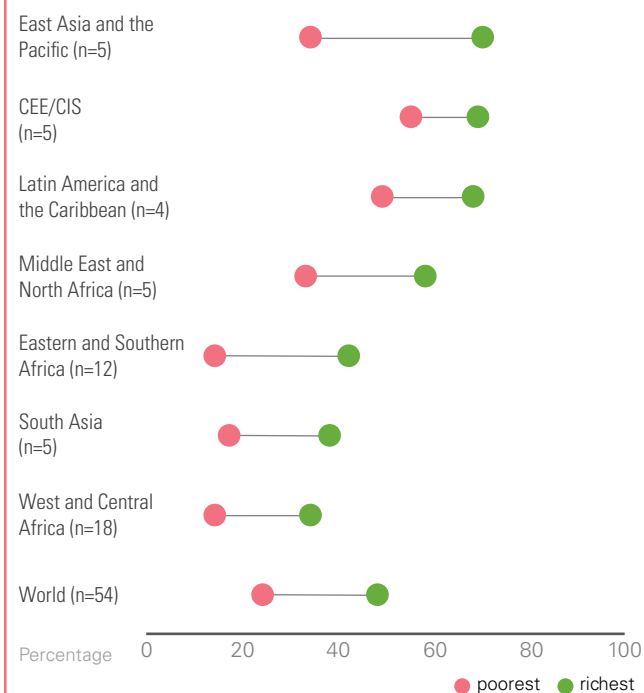
### What do the numbers tell us?

Globally, less than one third of the world's infants and young children are fed at least four food groups, leaving nearly 70 per cent at risk of undernutrition including micronutrient deficiencies.

In South Asia, West and Central Africa and Eastern and Southern Africa, the situation is dire: only one in five children aged 6–23 months is eating a minimally diverse diet. Of the regions with data, Latin American and the Caribbean and East Asia and the Pacific have the best rates of dietary diversity, with 72 per cent and 60 per cent of children between 6 months and 23 months of age receiving a minimally diverse diet, respectively.

As illustrated in the figure to the right, children from the poorest households suffer the worst rates of dietary diversity in all regions. In West and Central Africa, Eastern and Southern Africa and South Asia, only around one in six children in the poorest households is eating a minimally diverse diet. Even in the richest households, far too many infants and young children are not being fed a minimally diverse diet in any region.

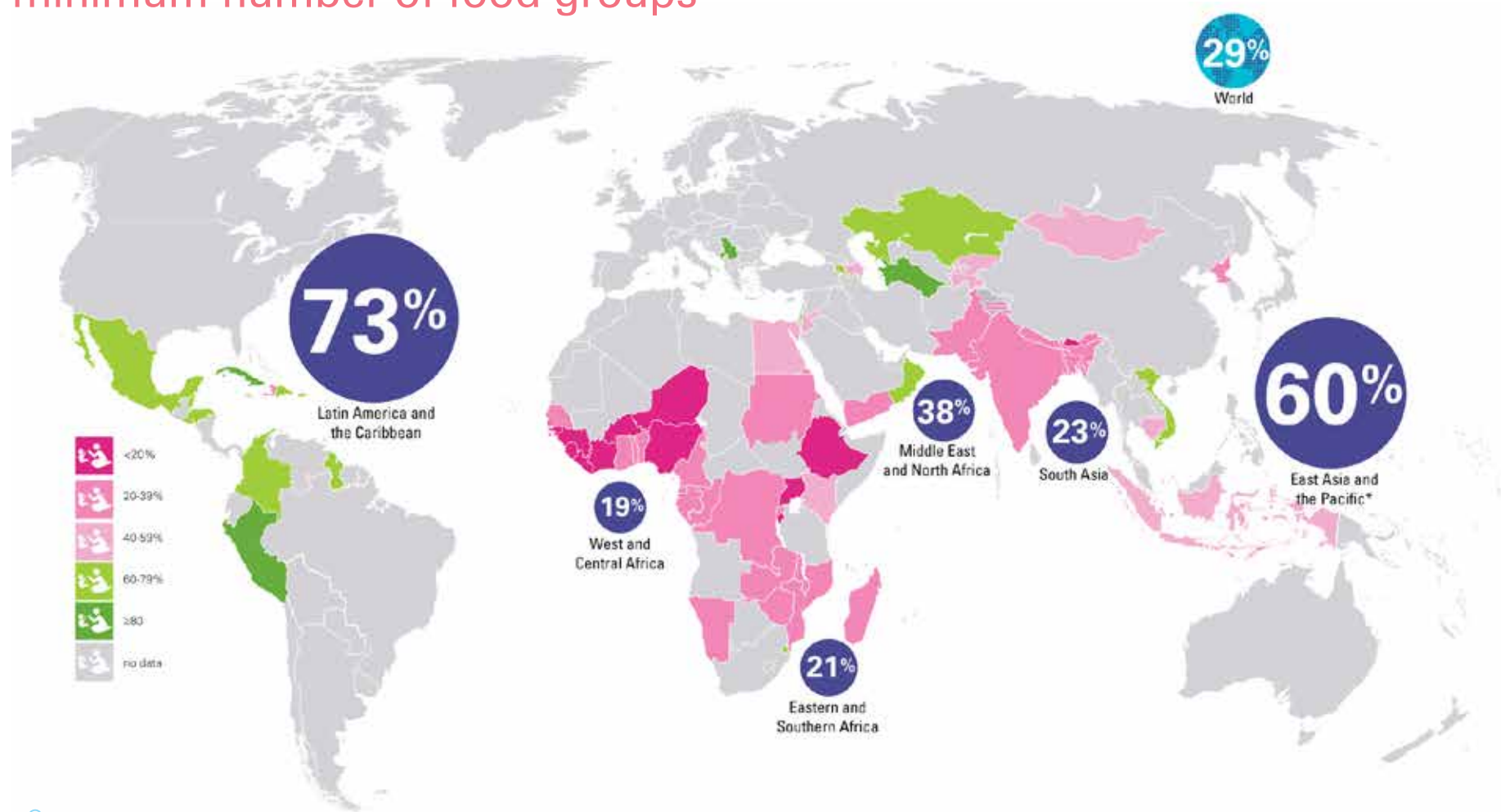
### The gap between the richest and poorest children for diet diversity is stark



Per cent (unweighted) of children aged 6-23 months with minimum diet diversity, by wealth quintile and region, 2015

Source: UNICEF global databases, 2016 based on MICS, DHS and other nationally representative sources. Note: Analysis is based on a subset of 54 countries with disaggregated data representing 53 per cent of the global population. While other graphs in this report present population weighted averages, unweighted means are presented for this graph due to low population coverage for two regions. As such these figures should be interpreted as illustrative values rather than representing these regions or the world as a whole.

# Only one in four infants and young children is eating food from the minimum number of food groups



Per cent of children 6-23 months of age with the minimum diet diversity, 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016.

Note: Regional estimates are presented only where adequate population coverage ( $\geq 50$  per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China. These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

## Minimum diet diversity

# REACHING THOSE MOST IN NEED

### Why is dietary diversity critical as early as 6 months of age?

Because the meals infants and young children can eat are so small, they must be nutrient-dense: every bite counts. To illustrate, between the ages of 6–8 months, a breastfed infant needs four times as much zinc and nine times as much iron per 1,000 calories of food as an adult male. As such, the period between 6 months and 11 months of age is typically one of the most challenging times for meeting micronutrient needs.<sup>5</sup>

Timing is crucial: recent evidence found that children who consumed the minimum diet diversity or an iron-rich diet at 6 months of age were taller and less wasted at 18 months than children who did not.<sup>6</sup> Between 6 months and 23 months of age, little or no consumption of nutrient-dense foods such as eggs, dairy products, fruits and vegetables is associated with stunting.<sup>7</sup>

Varied diets also help establish good eating habits. For example, infrequent consumption of fruits and vegetables between 6 months and 11 months of age has been found to be associated with infrequent intake of these foods at 6 years of age.<sup>8</sup>

Globally, the consumption of commercially produced snack foods and beverages pose a threat to the quality and diversity of children's diets. The availability of such foods and drinks are increasing, and families find them attractive because they are inexpensive and convenient. Most commercially produced drinks and snack foods provide energy but lack essential nutrients, and can reduce a child's appetite for a more nutritious and diverse diet (*see box below*).<sup>9</sup>

### What do the numbers tell us?

Among all countries with available data, fewer than a quarter of children 6–11 months of age receive four or more food groups a day, compared with nearly half of children 18 to 23 months of age.

In South Asia and West and Central Africa, fewer than 15 per cent of infants 6–11 months of age receive the minimum diet diversity; alarmingly, in these regions, more than one in five children 6–11 months old receive no food groups.

Consumption of a diverse diet among children 6–23 months of age is higher in Latin America and the Caribbean, CEE/CIS and East Asia and the Pacific; however, children 6–11 months of age have the lowest rates of all.

### When snack and junk food takes the place of healthy meals

Sales of commercially processed foods are increasing throughout the world. Some of these products are specially prepared foods that have been fortified to meet the uniquely high nutrient requirements of 6–23-month-olds. But many more are processed snack foods and several of them are unhealthy snack foods – such as chips and cookies – which are often high in energy, but low in micronutrients and protein, and packed with fat, sugar and salt.

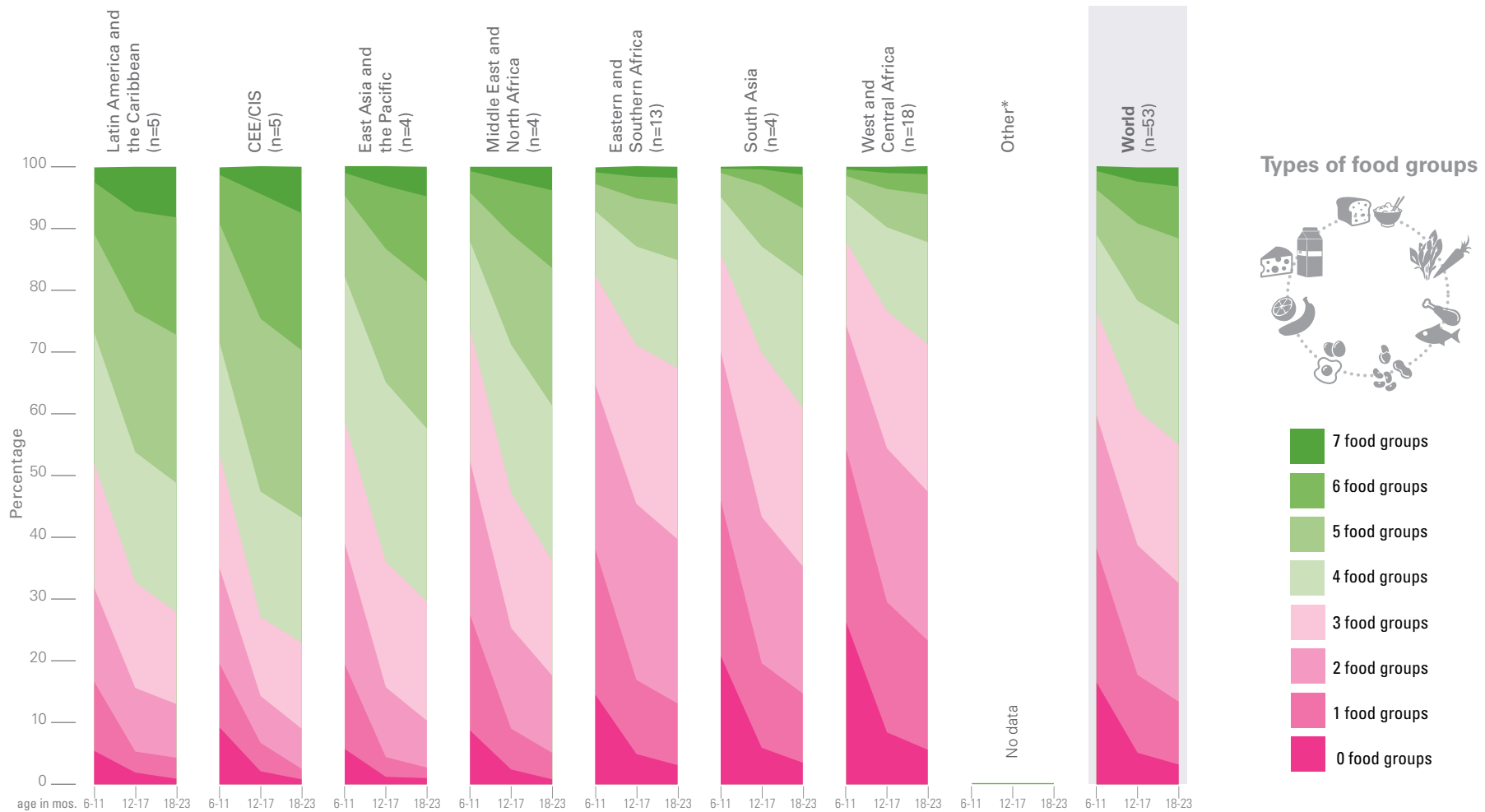
Such 'junk foods' are becoming too common in children's diets in high- and low-income countries alike. A study from Nepal showed that 74 per cent of children 6–23 months old had consumed commercially produced snack foods in the previous day, and 91 per cent in the previous week. Almost half were already consuming commercially produced snack foods between 6 months and 11 months of age.<sup>10</sup>

Eating junk foods early in life may be predictive of future eating habits: in one study, infants who were fed sugary drinks were more likely to still be drinking at least one sugary drink a day at age 6.<sup>11</sup> Unhealthy diets are costly for both children and the societies in which they live. Sugary snacks increase the risk of dental caries<sup>11, 12</sup> and set children on the path to overweight, obesity and chronic disease in adulthood.<sup>13, 14</sup>

The food and beverage industry invests significant resources in marketing and promoting commercial snack foods. More than 85 per cent of mothers living in urban centres in Cambodia, Nepal and Senegal reported being exposed to promotions for commercially produced snack foods.<sup>15</sup> It is critical for countries to pass legislation to regulate promotion of foods for infants and young children.



# Children 6–11 months of age have the least diverse diet



Minimum diet diversity 

 Per cent (unweighted) of children 6-23 months of age in each food group category, by age and by region, 2015

**Source:** UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.  
**Note:** Analysis is based on a subset of 53 countries with available data on the consumption of the 7 food groups by age group, covering 55 per cent of the global population. While other graphs in this report present population weighted averages, unweighted means are presented for this graph due to low population coverage for three regions. As such these figures should be interpreted as illustrative values rather than representing these regions or the world as a whole. The number of countries included in the analysis for each region is presented in brackets beside the region name. \*Other refers to mainly high-income countries not included within UNICEF programme regions.

## Minimum diet diversity

# MAXIMIZING NUTRIENTS WITH EACH BITE

### Why does the consumption of animal source foods matter?

Infants and young children have extremely high nutrient needs – and getting enough good nutrition into each mouthful is no easy task. Children need foods that pack a nutrient-dense punch. The needs for zinc and iron, minerals essential for optimal growth, immune function and development, are particularly high early in life.<sup>5, 9, 16, 17</sup> Flesh foods, eggs and dairy products are particularly effective at providing these essential nutrients, as well as vitamin A and calcium, between the ages of 6 months and 23 months.<sup>9, 18</sup>

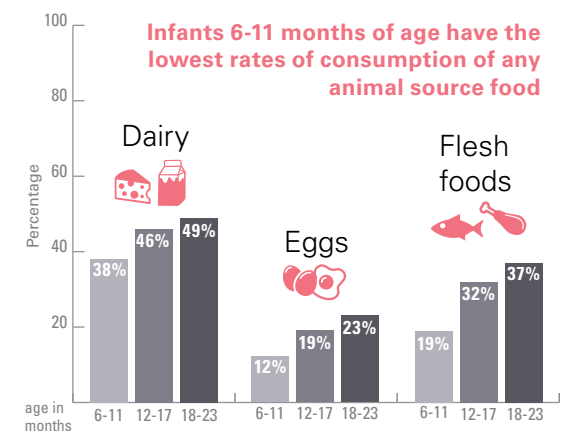
The benefits of consuming of animal source foods among infants and young children include improved growth, micronutrient status, cognitive performance and level of physical activity.<sup>7, 18</sup> Evidence has shown that iron-deficiency anaemia in infancy is related to poorer cognition in children,<sup>19</sup> and that an iron-rich diet is essential for its prevention.

Diversification of diet using locally available foods and inclusion of animal source foods to fill the nutrient gap can be difficult due to prohibitive cost, cultural norms or availability. In such circumstances, fortified foods may be needed to prevent micronutrient deficiencies among infants and young children (*see box below*).

### What do the numbers tell us?

There are vast differences in the consumption of animal source foods across regions, but one thing remains consistent: fewer children are eating animal source foods between 6 months and 11 months of age than between 12 months and 23 months in every region. Despite improvements in animal source food consumption as children age, the fact that a third of these nearly 2-year-old children are still not consuming any animal source foods at all requires programmatic action.

Consumption of eggs and flesh foods are particularly low among all age groups, but of greatest concern among the youngest.



Per cent of children 6-23 months of age fed animal source foods, by type and by age, 2015<sup>22</sup>

### Micronutrient powders: Boosting children's nutrition, one packet at a time

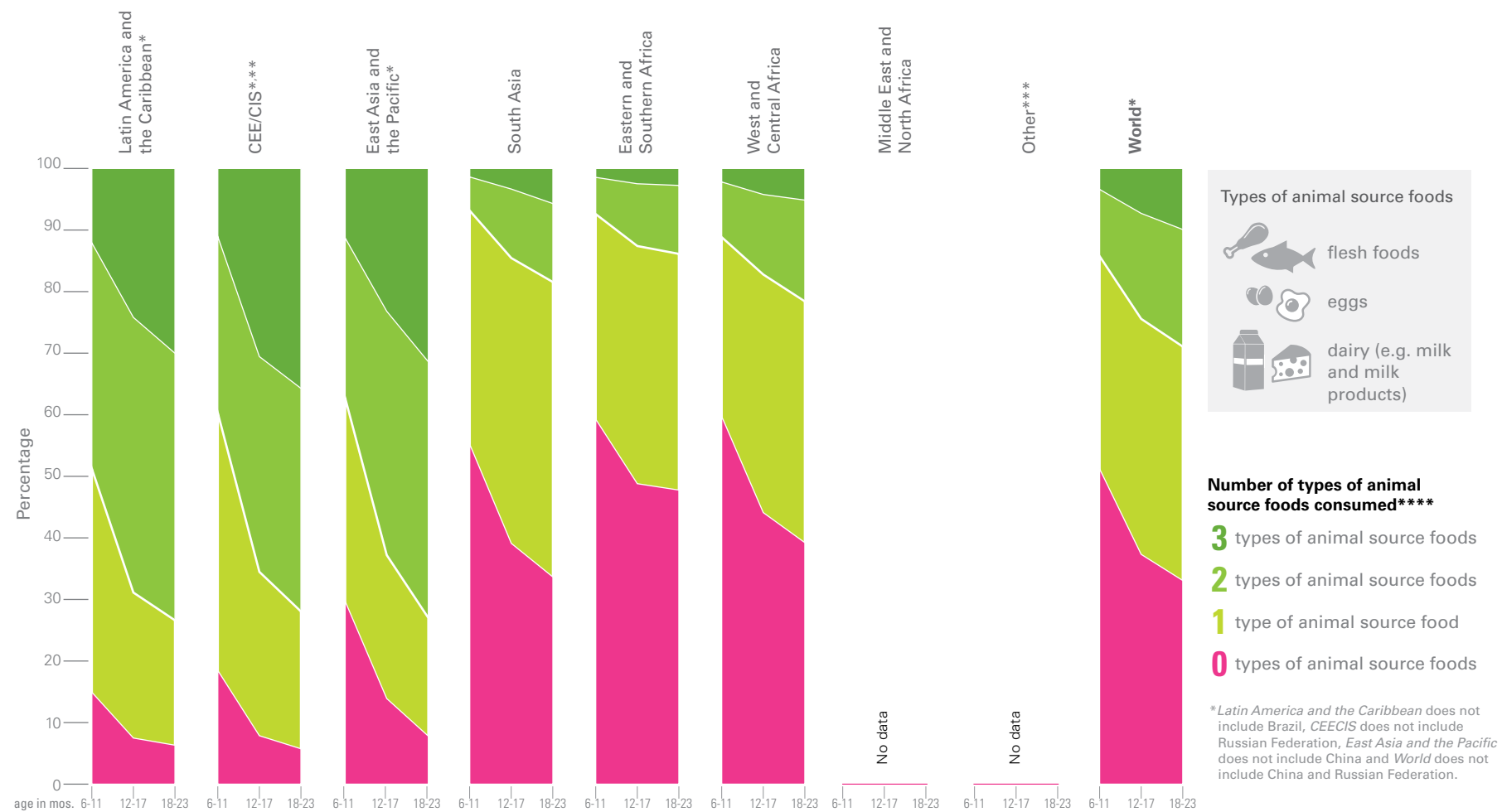
Access to a diverse diet is simply not a reality for many children in the world. For these children, fortified foods as well as fortification of foods prepared within the home can provide one of the best opportunities for preventing undernutrition.

Home fortification programmes provide caregivers with micronutrient powders (MNPs) – packets of vitamins and minerals such as iron, vitamin A and zinc – to sprinkle on the foods they prepare for children in the home. Such programmes can significantly improve the quality of children's diets from the age of 6 months to 23 months or longer, thereby preventing the devastating consequences of micronutrient deficiencies. Home fortification also empowers caregivers by providing them with the tools to improve their children's diets without changing their entire family's dietary practices.

Home fortification with MNPs is recommended in settings where families lack access to nutrient-dense foods or where the prevalence of anaemia in children is greater than 20 per cent. The use of MNPs has been found to reduce anaemia prevalence by more than 30 per cent. However, MNPs do not improve growth outcomes.<sup>20, 21</sup> Home fortification should not be a stand-alone intervention, but instead be integrated in infant and young child feeding programmes, coupled with education to improve feeding practices and diet diversity overall.



# Globally, the vast majority of children are eating only one type of animal source food – or none at all



Per cent of children 6-23 months of age in each animal source food group category, by age and by region, 2015

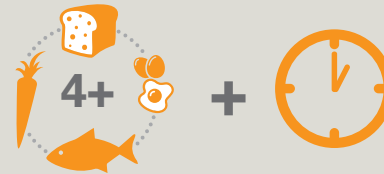
Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources.  
 Note: Analysis is based on a subset of 55 countries with data on types of animal source foods consumed between 2010-2014 covering 67 per cent of the global population excluding China and Russian Federation. Regional estimates are presented only where adequate population coverage (≥ 50 per cent) is met. \*To meet adequate population coverage, Latin America and the Caribbean does not include Brazil, CEE/CIS does not include Russian Federation and East Asia and the Pacific does not include China. \*\*Even after exclusion of Russian Federation from the analysis, CEE/CIS only met 45 per cent population coverage. \*\*\*Other refers to mainly high-income countries not included within UNICEF programme regions. \*\*\*\*The animal source foods were grouped into the three following types (i) flesh foods; (ii) eggs; and (iii) dairy (e.g. milk and milk products).



A young child eats meat of a fresh green coconut in Tahuak village, Ta Oi district of Saravane province in Lao People's Democratic Republic. © UNICEF/UNI182511/Noorani

# MINIMUM ACCEPTABLE DIET

Globally, only  
**1 in every 6**  
children is receiving  
a minimum  
acceptable diet.



*The minimum acceptable diet refers to meeting both the minimum meal frequency and minimum dietary diversity*

## Minimum acceptable diet

# FACING THE FEEDING CHALLENGE

### What do appropriate feeding practices look like?

Healthy diets are about more than just food. Appropriate feeding practices depend not only on *what* a child eats, but also *when* and *how* they eat.

We know that the period from 6 months to 23 months of age is one of the most challenging periods for meeting children's nutritional requirements, and that children are especially vulnerable to growth-faltering during this time.<sup>1-3</sup>

To ensure optimal growth and development, children need to be fed frequently throughout the day, and their meals must be nutrient-dense and come from a variety of different food groups. Together, minimum meal frequency and minimum diet diversity are referred to by WHO as the minimum acceptable diet.<sup>4</sup> Evidence has shown that children eating a minimum acceptable diet have a significantly lower risk of both stunting and underweight.<sup>5</sup>

The minimum acceptable diet is a composite indicator for feeding practices among 6–23-month-olds – which is measurable at the population level – but appropriate feeding practices involve much more. Children's meals need to be prepared safely and hygienically, and they need to be provided by responsive caregivers who interact with the children, encourage them to eat, and respond to their appetite and hunger cues (see pages 88 and 89). While vitally important, there are no current methods for measuring these complex components of feeding practices at the population level.

The absence of any of these aspects of appropriate feeding can be detrimental to the quality of a child's diet, and may undermine growth and development. A child who eats frequent meals of thin, watery porridge is not getting the nutrition she or he needs,

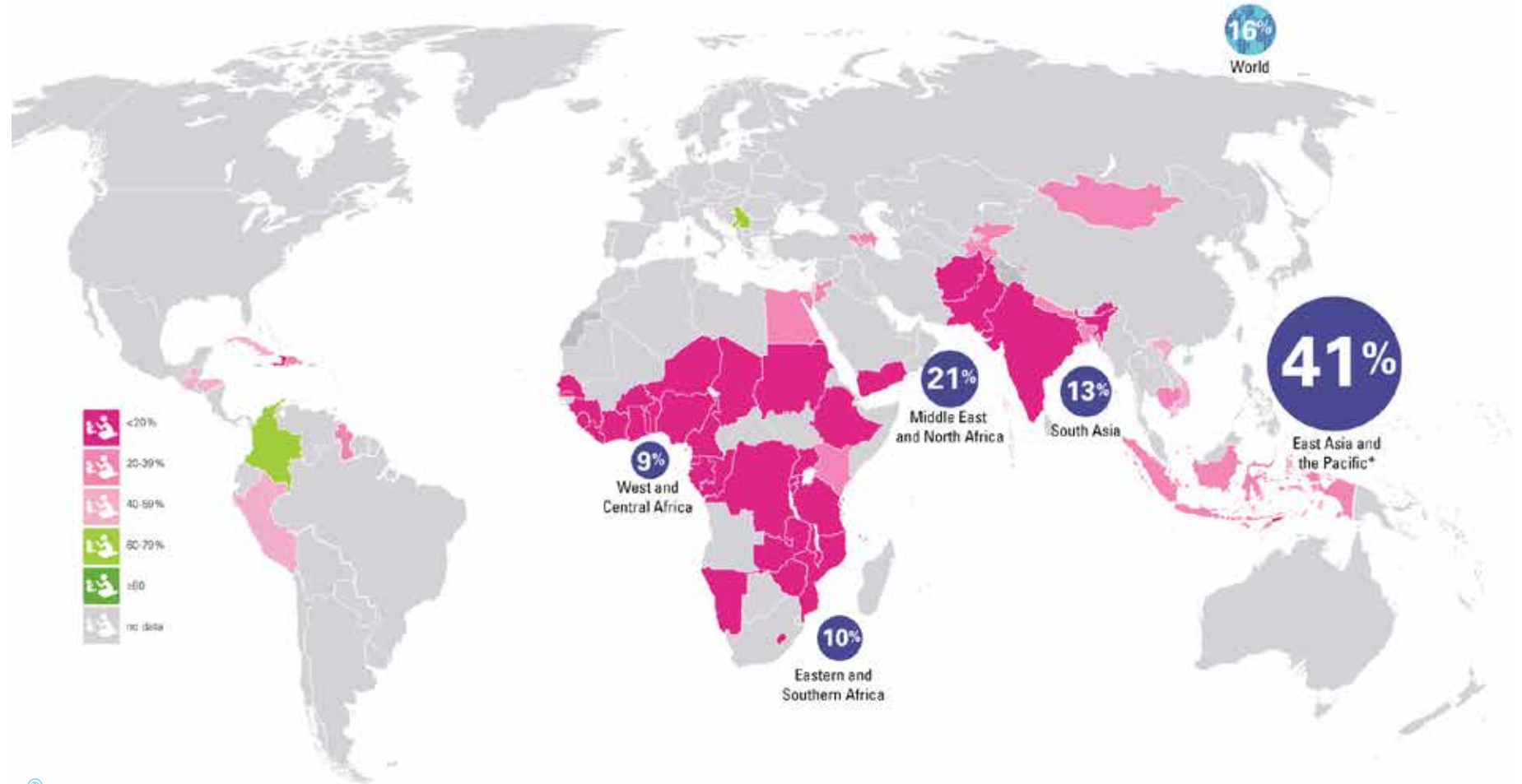
nor is a child who only eats one meal a day, even if it contains the minimum number of food groups. Even a child who eats a sufficient number of healthy meals each day is vulnerable to infection and undernutrition if those meals are prepared with unwashed hands, mixed with unsafe water or served in a dirty bowl.


### What do the numbers tell us?

There are far too many children being deprived of a healthy diet around the world: only one in every six children is receiving a minimum acceptable diet.

The situation is dire in West and Central Africa, Eastern and Southern Africa and South Asia, where only around 10 per cent of children 6-23 months of age are fed a minimally acceptable diet. Rates are much higher in East Asia and the Pacific, with 41 per cent of infants and young children meeting the criteria.

# The per cent of children eating a diet that has both the minimum diversity and minimum frequency is shockingly low



 Per cent of children 6-23 months of age with a minimum acceptable diet, 2015

Source: UNICEF global databases, 2016, based on MICS, DHS and other nationally representative sources, 2010-2016.

Note: Regional estimates are presented only where adequate population coverage (≥ 50 per cent) is met. \*To meet adequate population coverage, East Asia and the Pacific does not include China. These maps are stylized and not to scale and do not reflect a position by UNICEF on the legal status of any country or territory or the delimitation of any frontiers. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined. The final status of the Abyei area has not yet been determined.

# KEEPING FOOD CLEAN AND SAFE

## How does safe food preparation and storage contribute to a healthy diet?

The way food is prepared is just as important as the nutrients it contains.

Inadequate access to safe water, sanitation and hygiene are well-established underlying causes of maternal and child undernutrition. Globally, diarrhoeal diseases are the second leading cause of death in children under five,<sup>6</sup> and WHO estimates that 50 per cent of undernutrition is associated with infections caused by unsafe water, poor sanitation and unhygienic practices.<sup>7,8</sup>

In a pooled analysis of nine studies with diarrhoea and growth data, the odds of stunting at 2 years of age increased with each episode of diarrhoea, and a quarter of all stunting in 24-month-old children was attributable to having five or more episodes of diarrhoea in the first two years of life.<sup>9, 10</sup>

Poor hygiene and subsequent diarrhoea may also contribute to stunting through chronic gut inflammation – referred to as environmental enteropathy, or EE – which is associated with malabsorption of nutrients and diversion of energy away from growth promotion to maintain the immune response.<sup>10, 11</sup> Children are particularly vulnerable to infection once they begin eating solid foods and transition from a

breastmilk-only diet. In fact, diarrhoea incidence rates are highest among children 6–11 months of age.<sup>12, 13</sup>

Safe food preparation, storage and hygiene practices are crucial to preventing the spread of disease and ensuring that good nutrition reaches and remains in children's bodies. The lack of access to sufficient water sources, cleaning products and utensils in many settings hinders caregivers from preparing and storing food in the safest way possible. Poor storage practices, insufficient cooking time, time elapsed between preparation of meals and feeding children, and poorly cleaned and dirty feeding bottles are all factors that may contribute to food-borne contamination.<sup>14</sup> Dirty or improperly cleaned hands can also be a source of food contamination. One study in Bangladesh found that 40 per cent of complementary foods were contaminated with high concentrations of pathogenic bacteria.<sup>15</sup>

Proper hygiene and food preparation practices include hand washing with soap for both caregivers and children before preparing and consuming meals, as well as cleaning all kitchen utensils and cooking surfaces. Foods should be provided to children using clean hands and/or utensils and liquids using a glass or cup rather than bottles with teats, as these are more easily contaminated without proper cleaning. Appropriate food storage includes

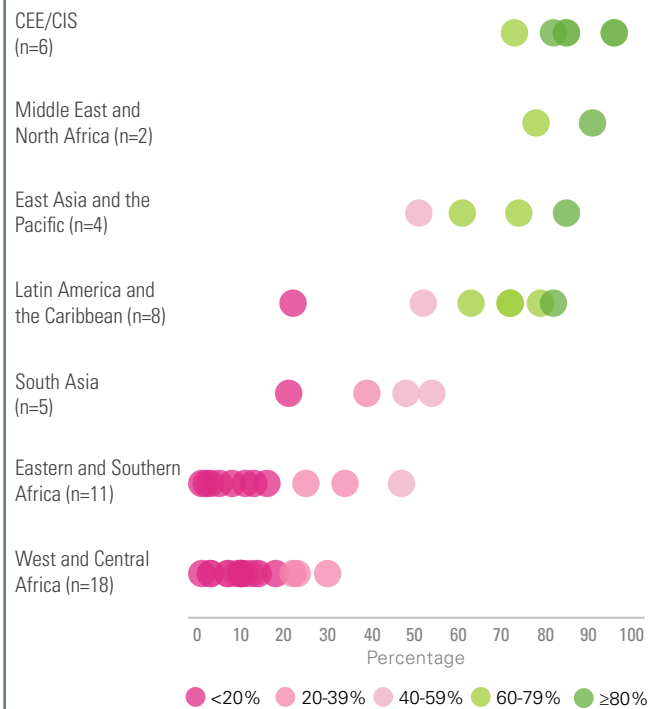
keeping foods at the right temperature to avoid spoilage and ensuring they are stored away from animals or other potential sources of contamination.

Interventions promoting hand washing with soap have consistently been shown to reduce childhood diseases.<sup>16</sup> However, adoption of proper hygiene practices can be hindered by lack of access to safe water, soap and utensils. Observation of a hand-washing facility with water and soap is a proxy for hand-washing behaviours, and household survey data from more than 50 countries show that coverage is low in several regions (*see graph on the right*).



# FEEDING WITH LOVE AND CARE

## In sub-Saharan Africa, availability of handwashing facilities with soap and water is extremely low



Proportion of the population with a handwashing facility with water and soap at home, by country and region, 2015

Source: WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (2015), based on MICS and DHS surveys. Note: Analysis is based on data for 54 countries representing 21 per cent of the global population. Each circle represents the rate for an individual country (in some cases rates are exactly the same and thus circles overlap) in each respective region and these figures should be interpreted as illustrative values rather than representing these regions as a whole.

## What is responsive feeding and why is it important?

The caregiver's role in feeding is as important as the food itself: caregivers should interact with the child, respond to his or her hunger signals, select appropriate foods and prepare those foods safely.

Responsive feeding refers to a reciprocal relationship between caregiver and child: the child signals a request with actions, words or facial expressions; the caregiver recognizes those signals and responds in a developmentally appropriate and supportive manner; and the child learns to expect a predictable response.<sup>17</sup>

Responsive feeding can help provide the foundation for developing healthy eating behaviours, including self-regulation and self-control over food intake.<sup>17</sup> It can also improve quality of feeding and facilitate a successful transition to independent feeding. In contrast, non-responsive feeding – which may involve forced or restrictive feeding or feeding in an uninvolved or neglectful manner – can impede a child's internal hunger and satiety cues, self-regulation and social and emotional development.<sup>18</sup>

Responsive feeding might be constrained due to a number of factors, including cultural

feeding styles that discourage responsive feeding, caregivers' time constraints and maternal stress.<sup>18</sup>

There is some evidence that responsive feeding may reduce illness and improve growth, dietary intake and eating behaviour. A study in Bangladesh found that children whose mothers were coached on responsive feeding refused fewer mouthfuls of food and started self-feeding sooner than children of mothers who did not receive such interventions.<sup>19</sup> A recent review of studies also found promising evidence that caregiver's verbal communication during feeding can increase a child's acceptance of food.<sup>20</sup>

While the evidence on the effect of responsive feeding in reducing undernutrition is promising, there is a need for more robust research to better isolate its effect from that of other feeding behaviours.<sup>20, 21</sup>

Early childhood stimulation and development – such as responsive play, communication and nurturing care – is connected to the concept of responsive feeding. Combined nutrition and early child development interventions may have a greater impact on child development and, in some cases, nutrition outcomes, than those interventions undertaken separately.<sup>22, 23</sup> Combined programmes may also be more cost-effective and make good programmatic sense.<sup>24, 25</sup>



A health worker talks to a group of mothers with their babies about complementary feeding and shows images on a flip chart at the local health centre, in the village of Sarkin Yamma Sofoua Madarounfa, Maradi region, South East Niger. © UNICEF/UNI115905/Pirozzi

# THE WAY FORWARD ON COMPLEMENTARY FEEDING

# THE WAY FORWARD FOR COMPLEMENTARY FEEDING

## What do we need to do better?

Families do their best with the resources they have to provide enough nutritious meals for their children – but they cannot do it alone. Government leadership and contributions from all sectors of society are needed to provide infants and young children with a healthy diet.

Adequate complementary feeding can achieve a broad range of short- and long-term outcomes, including improved child growth and development, the prevention of stunting, wasting, obesity and deficiencies in essential vitamins and minerals. National investments in nutrition are critical to ensure that policies, strategies and programmes that aim to improve complementary feeding practices are adequately prioritized and financed.

## Policy actions

Governments need to create policy and social and economic environments that enable households and caregivers to make well-informed decisions on infant and young child feeding. This includes **national laws, policies, strategies and programmes** that help foster an enabling environment for nutrition.

Following the welcoming of the **Guidance on Ending the Inappropriate Promotion of Foods for Infants and Young Children** by the WHA in mid-2016, governments should

enact legislation and adopt policies to prohibit the inappropriate promotion of all commercially produced food or beverage products that are specifically marketed as suitable for feeding children up to 36 months of age, while continuing to adopt and enforce the International Code of Marketing of Breastmilk Substitutes.

## Programmatic actions

Complementary feeding programmes should improve knowledge of appropriate practices, address nutrient density and the diversity of foods consumed, encourage continued breastfeeding during the complementary feeding period, support responsive feeding interactions, and enable more families to choose nutritious meals over unhealthy foods or snacks.

## Multiple strategies need to be combined

to foster optimal feeding practices. Success requires not only improved caregiver knowledge and practices, but also improved availability and access to, and increased quality of, foods, among other things. The mix of strategies required extends beyond the health sector.

The selection and prioritization of strategies and interventions should be context-specific. These need to be **evidence-based** and informed by adequate situation analyses. This ensures that the design, planning and implementation of complementary feeding programmes are tailored to the local context. **Formative research** is key:

local complementary feeding barriers, enablers, cultural taboos and practices need to be identified in order to develop evidence-based communication messages and interventions to ensure locally appropriate solutions.

## Multi-sectoral actions

To make better progress on complementary feeding, coordinated actions among key government sectors is critical. The sectors involved should be identified based on evidence of the underlying causes of malnutrition and the political and economic context. **The roles and responsibilities for improving feeding practices for sectors beyond health and nutrition need to be clearly defined and communicated.**

Governments must provide leadership in building nutrition into the strategies of all relevant sectors and in coordinating efforts across sectors. While the health sector is almost always involved, other key sectors which may need to be engaged include agriculture, water and sanitation, education and social protection.

Within the **health sector**, facility and community-based health services should be better leveraged to provide **skilled support** for caregivers on infant and young child feeding, including during and after episodes of illnesses. Such support, combined with evidence-based

behaviour change communication strategies, improves the knowledge of caregivers and gives them the tools to improve family feeding practices. Building health workers capacity in counseling and optimal infant and young child feeding practices is essential for fostering change.

Support from the **agricultural sector** is needed to develop sustainable food systems. Depending on the context, this may include fortification of staple grains and condiments, bio-fortification of staple crops and crop diversification initiatives. Investments in animal husbandry to improve availability of animal source foods for young children may also be required.

The **social protection sector** can support complementary feeding by helping families gain access to nutritious foods. Cash or in-kind transfers to vulnerable families, combined with nutrition and health counselling, can empower caregivers and contribute to breaking the cycle of poverty and poor nutrition.

Support from the **water, sanitation and hygiene sector** is crucial to ensuring access to safe drinking water that can be used to wash or prepare foods safely. Adequate sanitation and a safe environment are needed to promote good hygiene and ensure that good nutrition is not lost to diarrhoeal illness.

The **education sector** is important because higher educational achievement for mothers is linked with better feeding practices for their children and improved linear growth.

**Communities and families** also play a crucial role in creating a healthy and nurturing feeding environment for their children: early childhood development interventions that **stimulate and encourage responsive feeding** should be integral to child nutrition programmes.

The **private sector** and the food industry in particular must contribute to produce affordable, nutritious complementary foods and comply with legislation and policies in place to control inappropriate promotion of commercially produced foods. Governments need to hold the private sector accountable for complying with regulations and also tap into their ability to create innovative food solutions that benefit children.

Efforts to reduce malnutrition and improve food security in the coming decades may be threatened by global **climate change**. Governments need to build the mitigation of climate change into nutrition, agriculture and health strategies.

Complementary feeding programmes should **be risk-informed** to ensure they can effectively adapt between development and emergency contexts.

## Monitoring actions

To understand their situation and track progress effectively, governments need to ensure that **credible and comprehensive data** on infant and young child feeding, aligned with the standard global indicators,<sup>1</sup> are reported on regularly, about every 3 to 5 years.

Robust **monitoring and evaluation systems** are essential for successful programmes and are needed for nutrition-specific and nutrition-sensitive actions alike. Adequate resources should be allocated for monitoring these programmes within government plans at all levels.

While indicators and related tools to assess infant and young child feeding practices exist<sup>1</sup> it would be timely to undertake a review and work towards development of indicators which can more comprehensively assess child feeding practices.

Urgent action is needed to improve children's diets. Children's first foods and feeding experience matter not only for their immediate survival but also for their potential over a lifetime. With government investments and contributions from key sectors in society, good nutrition in the earliest years has the power to shape a more fair and sustainable future.



# LAST WORDS

From the first hour of life, eating is a fundamental part of the human experience. When a newborn enters the world, families strive to give that child the best start in life – and food is central to those efforts.

It is not an exaggeration to say that the nourishment a child receives from the first hour after birth to age 2 sets the course of his or her life. This is a powerful opportunity to enhance a child's future – but a heavy burden to place on the shoulders of families alone. To effectively ensure that all children have the right foods to survive, grow, develop and thrive, good nutrition must be understood as a collective responsibility.

When women have support from their spouses and families, they gain the time, space and confidence to breastfeed. With supportive health-care systems, they acquire the knowledge, guidance and encouragement to make breastfeeding successful. With supportive workplaces and communities, they receive the acceptance and accommodation needed to make breastfeeding work. And with supportive government policies and legislation, their choices are protected by law and they are empowered to breastfeed whenever and wherever they choose.

With leadership and investment from governments to make young child nutrition a priority and with collaboration across sectors – from agriculture to social protection and beyond – we have the key ingredients for success: nutritious food becomes available and affordable for children and their families, and caregivers have the knowledge and resources to provide those foods safely and with nurturing care.

**Improved infant and young child nutrition is fundamental to guaranteeing children a brighter and more equitable future. We all have a responsibility to make it happen. Let's start now.**

# Endnotes

## Foreword

1. UNICEF, World Health Organization and World Bank (2016). Joint Child Malnutrition Estimates - Levels and Trends, 2016 edition. <<http://data.unicef.org/nutrition/malnutrition.html>>.

## Introduction

1. UNICEF, World Health Organization and World Bank (2016). Joint Child Malnutrition Estimates - Levels and Trends, 2016 edition.
2. Victora, C.G., et al., *Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect*. Lancet, 2016. 387(10017): p. 475-90.
3. Quigley, M.A., Y.J. Kelly, and A. Sacker, *Breastfeeding and hospitalization for diarrheal and respiratory infection in the United Kingdom Millennium Cohort Study*. Pediatrics, 2007. 119(4): p. e837-42.
4. Onyango, A.W., O. Receveur, and S.A. Esrey, *The contribution of breast milk to toddler diets in western Kenya*. Bull World Health Organ, 2002. 80(4): p. 292-9.
5. Chowdhury, R., et al., *Breastfeeding and maternal health outcomes: a systematic review and meta-analysis*. Acta Paediatr, 2015. 104(467): p. 96-113.
6. Rollins, B., Hajeerbhoy, Horton, Lutter, Martines, Piwoz, Richter, Victora; Lancet Breastfeeding Series Group., *Why invest, and what it will take to improve breastfeeding practices?* The Lancet, 2016. 387(10017): p. 491-504.
7. World Health Organization. and UNICEF., *Global Strategy for Infant and Young Child Feeding*. 2003, Geneva: World Health Organization.
8. WHO Programme of Nutrition., *Complementary feeding of young children in developing countries: a review of current scientific knowledge*. 1998, Geneva: World Health Organization.
9. Pan American Health Organization., *Guiding principles for complementary feeding of the breastfed child*. 2003, Washington, D.C.: Pan American Health Organization.
10. Ruel, M.T. and H. Alderman, *Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition?* Lancet, 2013. 382(9891): p. 536-51.
11. Walker, S.P., et al., *Effects of early childhood psychosocial stimulation and nutritional supplementation on cognition and education in growth-stunted Jamaican children: prospective cohort study*. Lancet, 2005. 366(9499): p. 1804-7.
12. Aboud, F.E. and S. Akhter, *A cluster-randomized evaluation of a responsive stimulation and feeding intervention in bangladesh*. Pediatrics, 2011. 127(5): p. e1191-7.
13. Bentley, M.E., H.M. Wasser, and H.M. Creed-Kanashiro, *Responsive feeding and child undernutrition in low- and middle-income countries*. J Nutr, 2011. 141(3): p. 502-7.
14. Wehrly, S.E., et al., *Controlling parental feeding practices and child body composition in ethnically and economically diverse preschool children*. Appetite, 2014. 73: p. 163-71.
15. Grimm, K.A., et al., *Fruit and vegetable intake during infancy and early childhood*. Pediatrics, 2014. 134 Suppl 1: p. S63-9.
16. Black, M.M., et al., *Early childhood development coming of age: science through the life course*. The Lancet, 2016.
17. Grantham-McGregor, S.M., et al., *Effects of integrated child development and nutrition interventions on child development and nutritional status*. Ann N Y Acad Sci, 2014. 1308: p. 11-32.
18. Grantham-McGregor, S., et al., *Developmental potential in the first 5 years for children in developing countries*. The Lancet. 369(9555): p. 60-70.
19. Fink, G., et al., *Schooling and wage income losses due to early-childhood growth faltering in developing countries: national, regional, and global estimates*. Am J Clin Nutr, 2016. 104(1): p. 104-12.
20. Black, R.E., et al., *Maternal and child undernutrition and overweight in low-income and middle-income countries*. Lancet, 2013. 382(9890): p. 427-51.
21. Keino, S., et al., *Determinants of stunting and overweight among young children and adolescents in sub-Saharan Africa*. Food Nutr Bull, 2014. 35(2): p. 167-78.
22. Lawn, J.E., S. Cousens, and J. Zupan, *4 million neonatal deaths: when? Where? Why?* Lancet, 2005. 365(9462): p. 891-900.
23. Ozaltin, E., K. Hill, and S.V. Subramanian, *Association of maternal stature with offspring mortality, underweight, and stunting in low- to middle-income countries*. Jama, 2010. 303(15): p. 1507-16.
24. Shekar, M., et al., *Repositioning nutrition as central to development : a strategy for large scale action*. Directions in development. 2006, Washington, DC: World Bank.
25. Bhutta, Z.A., et al., *Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?* Lancet, 2013. 382(9890): p. 452-77.
26. World Health Organization. Dept. of Child and Adolescent Health and Development., *Indicators for assessing infant and young child feeding practices: part 1: definitions*. 2008, Geneva: World Health Organization.
27. Note that all age ranges for the indicators represent children younger than 2 years of age, that means children are included in this indicator until 529 days of life, or just before they turn 2 years (or just before they turn 530 days) of age.



28. Note that all age ranges for the indicators represent age in completed months; that means children are included in this indicator until 182 days of life, or just before they turn 6 months (or just before they turn 183 days) of age.

### Early Initiation of Breastfeeding

1. NEOVITA Study Group. Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. *Lancet Glob Health*, 2016. 4(4): p. e266-75.
2. Moore, E.R., et al., Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev*, 2012(5): p. CD003519.
3. Boccolini, C.S., et al., Inequities in milk-based prelacteal feedings in Latin America and the Caribbean: the role of cesarean section delivery. *J Hum Lact*, 2015. 31(1): p. 89-98.
4. Gura, T., Nature's first functional food. *Science*, 2014. 345(6198): p. 747-9.
5. Victora, C.G., et al., Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*, 2016. 387(10017): p. 475-90.
6. Verduci, E., et al., Epigenetic effects of human breast milk. *Nutrients*, 2014. 6(4): p. 1711-24.
7. Mayer-Davis, E.J., et al., Breast-feeding and risk for childhood obesity: does maternal diabetes or obesity status matter? *Diabetes Care*, 2006. 29(10): p. 2231-7.
8. UNICEF, *Committing to Child Survival: A Promise Renewed-Progress Report 2015*. 2015, UNICEF: New York.
9. UN IGME Levels & Trends in Child Mortality Report 2015: Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation. 2015, United Nations Children's Fund.
10. UNICEF., WHO, *Every Newborn: an action plan to end preventable deaths*. 2014, World Health Organization: Geneva.
11. McKenna, K.M. and R.T. Shankar, The practice of prelacteal feeding to newborns among Hindu and Muslim families. *J Midwifery Womens Health*, 2009. 54(1): p. 78-81.
12. McFadden, A., et al., Spotlight on infant formula: coordinated global action needed. *Lancet*, 2016. 387(10017): p. 413-5.
13. Baker, E.J., L.C. Sanei, and N. Franklin, Early initiation of and exclusive breastfeeding in large-scale community-based programmes in Bolivia and Madagascar. *J Health Popul Nutr*, 2006. 24(4): p. 530-9.
14. Piwoz, E.G. and S.L. Huffman, The Impact of Marketing of Breast-Milk Substitutes on WHO-Recommended Breastfeeding Practices. *Food Nutr Bull*, 2015. 36(4): p. 373-86.
15. UNICEF, *Institutional Deliveries* (Last updated Feb 2016), in UNICEF Global Databases. 2016, United Nations Children's Fund: New York.
16. Legesse, M., et al., Prelacteal feeding practices and associated factors among mothers of children aged less than 24 months in Raya Kobo district, North Eastern Ethiopia: a cross-sectional study. *Int Breastfeed J*, 2014. 9(1): p. 189.
5. Chowdhury, R., et al., *Breastfeeding and maternal health outcomes: a systematic review and meta-analysis*. *Acta Paediatr*, 2015. 104(467): p. 96-113.
6. Liu, J., P. Leung, and A. Yang, *Breastfeeding and active bonding protects against children's internalizing behavior problems*. *Nutrients*, 2014. 6(1): p. 76-89.
7. WHO, *Complementary feeding of young children in developing countries : a review of current scientific knowledge*. 1998, Geneva: World Health Organization. 228 p.
8. Dewey, K.G., *Nutrition, growth, and complementary feeding of the breastfed infant*. *Pediatr Clin North Am*, 2001. 48(1): p. 87-104.
9. Horta, B.L., C. Loret de Mola, and C.G. Victora, *Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis*. *Acta Paediatrica*, 2015. 104: p. 30-37.
10. Gura, T., *Nature's first functional food*. *Science*, 2014. 345(6198): p. 747-9.
11. UNICEF, *Annual Results Report 2015:- Nutrition*. 2015, UNICEF: New York. p. 16.
12. WHO, *Guidelines on HIV and infant feeding 2010: principles and recommendations for infant feeding in the context of HIV and a summary of evidence*. 2010, Geneva: World Health Organization. 49 p.
13. WHO, *HIV and infant feeding 2010: an updated framework for priority action*, in *WHO: Guidelines*. 2012, World Health Organization: Geneva.
14. WHO, *Guidelines: Updates on HIV and infant feeding 2016*. 2016, Geneva: World Health Organization.

### Exclusive Breastfeeding

1. Sankar, M.J., et al., *Optimal breastfeeding practices and infant and child mortality: a systematic review and meta-analysis*. *Acta Paediatr*, 2015. 104(467): p. 3-13.
2. Victora, C.G., et al., *Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect*. *Lancet*, 2016. 387(10017): p. 475-90.
3. Quigley, M.A., Y.J. Kelly, and A. Sacker, *Breastfeeding and hospitalization for diarrheal and respiratory infection in the United Kingdom Millennium Cohort Study*. *Pediatrics*, 2007. 119(4): p. e837-42.
4. Lewandowski, A.J., et al., *Breast Milk Consumption in Preterm Neonates and Cardiac Shape in Adulthood*. *Pediatrics*, 2016. 138(1).

### Continued Breastfeeding

1. WHO, *Guiding principles for complementary feeding of the breastfed child*. 2003, WHO.
2. Esrey, S.A., A.W. Onyango, and O. Receveur, *The contribution of breast milk to toddler diets in western Kenya*. *Bulletin of the World Health Organization*, 2002. 80(4): p. 292.

3. Brown, K.H., et al., *Effects of common illnesses on infants' energy intakes from breast milk and other foods during longitudinal community-based studies in Huascar (Lima), Peru*. Am J Clin Nutr, 1990. 52(6): p. 1005-13.
4. Victora, C.G., et al., Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet, 2016. 387(10017): p. 475-90.
5. Victora, C.G., et al., *Association between breastfeeding and intelligence, educational attainment, and income at 30 years of age: a prospective birth cohort study from Brazil*. Lancet Glob Health, 2015. 3(4): p. e199-205.
6. WHO, UNICEF, IBFAN, *Marketing of breast-milk substitutes: National implementation of the international code*, WHO, Editor. 2016.
7. Rollins, B., Hajeerhoy, Horton, Lutter, Martines, Piwoz, Richter, Victora; Lancet Breastfeeding Series Group., *Why invest, and what it will take to improve breastfeeding practices?* The Lancet, 2016. 387(10017): p. 491-504.
8. Piwoz, E.G. and S.L. Huffman, *The Impact of Marketing of Breast-Milk Substitutes on WHO-Recommended Breastfeeding Practices*. Food Nutr Bull, 2015. 36(4): p. 373-86.
5. Donnelly, A., et al., *Commercial hospital discharge packs for breastfeeding women*. Cochrane Database Syst Rev, 2000(2): p. CD002075.
6. Rollins, B., Hajeerhoy, Horton, Lutter, Martines, Piwoz, Richter, Victora; Lancet Breastfeeding Series Group., *Why invest, and what it will take to improve breastfeeding practices?* The Lancet, 2016. 387(10017): p. 491-504.
7. Lutter, C.K., *The International Code of Marketing of Breast-milk Substitutes: lessons learned and implications for the regulation of marketing of foods and beverages to children*. Public Health Nutr, 2013. 16(10): p. 1879-84.
8. Victora, C.G., et al., *Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect*. Lancet, 2016. 387(10017): p. 475-90.
6. Perez-Escamilla, R., J.L. Martinez, and S. Segura-Perez, *Impact of the Baby-friendly Hospital Initiative on breastfeeding and child health outcomes: a systematic review*. Matern Child Nutr, 2016. 12(3): p. 402-17.
7. Boccolini, C.S., et al., *Inequities in milk-based prelacteal feedings in Latin America and the Caribbean: the role of cesarean section delivery*. J Hum Lact, 2015. 31(1): p. 89-98.

### International Code of Marketing of Breast-Milk Substitutes

1. WHO, *International Code of Marketing of Breast-Milk Substitutes*. 1981: Switzerland. p. 36.
2. Organization, W.H., *Country Implementation of the International Code of Marketing of Breast-Milk Substitutes: Status Report 2011*. 2011, World Health Organization.
3. Piwoz, E.G. and S.L. Huffman, *The Impact of Marketing of Breast-Milk Substitutes on WHO-Recommended Breastfeeding Practices*. Food Nutr Bull, 2015. 36(4): p. 373-86.
4. Parry, K., et al., *Understanding women's interpretations of infant formula advertising*. Birth, 2013. 40(2): p. 115-24.

### The way forward on breastfeeding

1. WHO, UNICEF, IBFAN. *Marketing of breast-milk substitutes: National implementation of the international code Status Report 2016*. Online 2016 cited 2016 27th July 2016; Available from: [http://www.who.int/nutrition/publications/infantfeeding/code\\_report2016/en/](http://www.who.int/nutrition/publications/infantfeeding/code_report2016/en/).
2. WHO. NetCode. Nutrition Online 2016 cited 2016 28th July 2016; Network for Global Monitoring and Support for Implementation of the International Code of Marketing of Breast-milk Substitutes and Subsequent relevant World Health Assembly Resolutions (NetCode). Available from: <http://who.int/nutrition/netcode/en/>.
3. Heymann, J., A. Raub, and A. Earle, *Breastfeeding policy: a globally comparative analysis*. Bull World Health Organ, 2013. 91(6): p. 398-406.
4. Nguyen, P.H., et al., *Prelacteal feeding practices in Vietnam: challenges and associated factors*. BMC Public Health, 2013. 13: p. 932.
5. UNICEF, *Institutional Deliveries (Last updated Feb 2016), in UNICEF Global Databases*. 2016, United Nations Children's Fund: New York.
1. WHO Programme of Nutrition., *Complementary feeding of young children in developing countries: a review of current scientific knowledge*. 1998, Geneva: World Health Organization.
2. Pan American Health Organization., *Guiding principles for complementary feeding of the breastfed child*. 2003, Washington, D.C.: Pan American Health Organization.
3. Dewey, K.G. and K.H. Brown, *Update on technical issues concerning complementary feeding of young children in developing countries and implications for intervention programs*. Food Nutr Bull, 2003. 24(1): p. 5-28.
4. Victora, C.G., et al., *Worldwide timing of growth faltering: revisiting implications for interventions*. Pediatrics, 2010. 125(3): p. e473-80.
5. Bhutta, Z.A., et al., *Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?* Lancet, 2013. 382(9890): p. 452-77.
6. Marriott, B.P., et al., *World Health Organization (WHO) infant and young child feeding indicators: associations with growth measures in 14 low-income countries*. Matern Child Nutr, 2012. 8(3): p. 354-70.
7. Alder, E.M., et al., *What influences the timing of the introduction of solid food to infants?* Br J Nutr, 2004. 92(3): p. 527-31.

8. Brown, A. and H. Rowan, *Maternal and infant factors associated with reasons for introducing solid foods*. *Matern Child Nutr*, 2016. 12(3): p. 500-15.
  9. Doub, A.E., K.J. Moding, and C.A. Stifter, *Infant and maternal predictors of early life feeding decisions. The timing of solid food introduction*. *Appetite*, 2015. 92: p. 261-8.
  10. Kimani-Murage, E.W., et al., *Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi Kenya*. *BMC Public Health*, 2011.
  11. Dewey, K.G., *Nutrition, growth, and complementary feeding of the breastfed infant*. *Pediatr Clin North Am*, 2001. 48(1): p. 87-104.
  12. Pearce, J., M.A. Taylor, and S.C. Langley-Evans, *Timing of the introduction of complementary feeding and risk of childhood obesity: a systematic review*. *Int J Obes (Lond)*, 2013. 37(10): p. 1295-306.
  13. Butte, N.F., M.G. Lopez-Alarcon, and C. Garza, *Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life*. 2002, Geneva: World Health Organization.
- Minimum meal frequency**
1. World Health Organization. Dept. of Child and Adolescent Health and Development. *Indicators for assessing infant and young child feeding practices: part 2: measurement*. 2010, Geneva: World Health Organization.
  2. Aguayo, V.M., et al., *Determinants of stunting and poor linear growth in children under 2 years of age in India: an in-depth analysis of Maharashtra's comprehensive nutrition survey*. *Matern Child Nutr*, 2016. 12 Suppl 1: p. 121-40.
- Minimum diet diversity**
1. World Health Organization. Dept. of Child and Adolescent Health and Development., *Indicators for assessing infant and young child feeding practices: part 2: measurement*. 2010, Geneva: World Health Organization.
  2. Onyango, A.W., et al., *Complementary feeding and attained linear growth among 6-23-month-old children*. *Public Health Nutr*, 2014. 17(9): p. 1975-83.
  3. Stevens, G.A., et al., *Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys*. *Lancet Glob Health*, 2015. 3(9): p. e528-36.
  4. Stevens, G.A., et al., *Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data*. *The Lancet Global Health*, 2013. 1(1): p. e16-e25.
  5. Dewey, K.G., *The challenge of meeting nutrient needs of infants and young children during the period of complementary feeding: an evolutionary perspective*. *J Nutr*, 2013. 143(12): p. 2050-4.
  6. Mallard, S.R., et al., *Dietary diversity at 6 months of age is associated with subsequent growth and mediates the effect of maternal education on infant growth in urban Zambia*. *J Nutr*, 2014. 144(11): p. 1818-25.
  7. Aguayo, V.M., et al., *Determinants of stunting and poor linear growth in children under 2 years of age in India: an in-depth analysis of Maharashtra's comprehensive nutrition survey*. *Matern Child Nutr*, 2016. 12 Suppl 1: p. 121-40.
  8. Grimm, K.A., et al., *Fruit and vegetable intake during infancy and early childhood*. *Pediatrics*, 2014. 134 Suppl 1: p. S63-9.
  9. Pan American Health Organization., *Guiding principles for complementary feeding of the breastfed child*. 2003, Washington, D.C.: Pan American Health Organization.
  10. Pries, A.M., et al., *High consumption of commercial food products among children less than 24 months of age and product promotion in Kathmandu Valley, Nepal*. *Matern Child Nutr*, 2016. 12 Suppl 2: p. 22-37.
  11. Park, S., et al., *Association of Sugar-Sweetened Beverage Intake during Infancy with Dental Caries in 6-year-olds*. *Clin Nutr Res*, 2015. 4(1): p. 9-17.
  12. Moynihan, P., *The interrelationship between diet and oral health*. *Proc Nutr Soc*, 2005. 64(4): p. 571-80.
  13. Malik, V.S., et al., *Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis*. *Diabetes Care*, 2010. 33(11): p. 2477-83.
  14. Malik, V.S., et al., *Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis*. *Am J Clin Nutr*, 2013. 98(4): p. 1084-102.
  15. Zehner, E., *Promotion and consumption of breastmilk substitutes and infant foods in Cambodia, Nepal, Senegal and Tanzania*. *Matern Child Nutr*, 2016. 12 Suppl 2: p. 3-7.
  16. Krebs, N.F., *Food Based Complementary Feeding Strategies for Breastfed Infants: What's the Evidence that it Matters?* *Nutr Today*, 2014. 49(6): p. 271-277.
  17. WHO Programme of Nutrition., *Complementary feeding of young children in developing countries: a review of current scientific knowledge*. 1998, Geneva: World Health Organization.
  18. Dror, D.K. and L.H. Allen, *The importance of milk and other animal-source foods for children in low-income countries*. *Food Nutr Bull*, 2011. 32(3): p. 227-43.
  19. Grantham-McGregor, S. and C. Ani, *A review of studies on the effect of iron deficiency on cognitive development in children*. *J Nutr*, 2001. 131(2s-2): p. 649S-666S; discussion 666S-668S.
  20. De-Regil, L.M., et al., *Home fortification of foods with multiple micronutrient powders for health and nutrition in children under two years of age*. *Cochrane Database Syst Rev*, 2011(9): p. Cd008959.

21. Salam, R.A., et al., *Effectiveness of Micronutrient Powders (MNP) in women and children*. BMC Public Health, 2013. 13 Suppl 3: p. S22.
22. Source: UNICEF Global Databases, 2016

### Minimum acceptable diet

1. Krebs, N.F., *Food Based Complementary Feeding Strategies for Breastfed Infants: What's the Evidence that it Matters?* Nutr Today, 2014. 49(6): p. 271-277.
2. Victora, C.G., et al., *Worldwide timing of growth faltering: revisiting implications for interventions*. Pediatrics, 2010. 125(3): p. e473-80.
3. Dewey, K.G., *The challenge of meeting nutrient needs of infants and young children during the period of complementary feeding: an evolutionary perspective*. J Nutr, 2013. 143(12): p. 2050-4.
4. World Health Organization. Dept. of Child and Adolescent Health and Development., *Indicators for assessing infant and young child feeding practices: part 2: measurement*. 2010, Geneva: World Health Organization. vi, 81 p.
5. Marriott, B.P., et al., *World Health Organization (WHO) infant and young child feeding indicators: associations with growth measures in 14 low-income countries*. Matern Child Nutr, 2012. 8(3): p. 354-70.
6. Liu, L., et al., *Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000*. Lancet, 2012. 379(9832): p. 2151-61.
7. Prüss-Üstün, A. and World Health Organization., *Safer water, better health : costs, benefits and sustainability of interventions to protect and promote health*. 2008, Geneva: World Health Organization.
8. Prüss-Üstün, A., C.F. Corvalán, and World Health Organization., *Preventing disease through healthy environments : towards an estimate of the environmental burden of disease : executive summary*. 2006, Geneva: World Health Organization.
9. Checkley, W., et al., *Multi-country analysis of the effects of diarrhoea on childhood stunting*. Int J Epidemiol, 2008. 37(4): p. 816-30.
10. Humphrey, J.H., *Child undernutrition, tropical enteropathy, toilets, and handwashing*. The Lancet, 2009. 374(9694): p. 1032-1035.
11. Arnold, B.F., et al., *Cluster-randomised controlled trials of individual and combined water, sanitation, hygiene and nutritional interventions in rural Bangladesh and Kenya: the WASH Benefits study design and rationale*. BMJ Open, 2013. 3(8): p. e003476.
12. Fischer Walker, C.L., et al., *Diarrhea incidence in low- and middle-income countries in 1990 and 2010: a systematic review*. BMC Public Health, 2012. 12: p. 220.
13. Pan American Health Organization., *Guiding principles for complementary feeding of the breastfed child*. 2003, Washington, D.C.: Pan American Health Organization.
14. Lanata, C.F., *Studies of food hygiene and diarrhoeal disease*. Int J Environ Health Res, 2003. 13 Suppl 1: p. S175-83.
15. Islam, M.A., et al., *Microbiological quality of complementary foods and its association with diarrhoeal morbidity and nutritional status of Bangladeshi children*. Eur J Clin Nutr, 2012. 66(11): p. 1242-6.
16. Luby, S.P., et al., *Effect of handwashing on child health: a randomised controlled trial*. The Lancet, 2005. 366(9481): p. 225-233.
17. Black, M.M. and F.E. Aboud, *Responsive feeding is embedded in a theoretical framework of responsive parenting*. J Nutr, 2011. 141(3): p. 490-4.
18. Britto, P., P. Engle, and S. C., *Handbook of the Early childhood development research and its impact on global policy*. 2013 Oxford University Press
19. Aboud, F.E. and S. Akhter, *A cluster-randomized evaluation of a responsive stimulation and feeding intervention in bangladesh*. Pediatrics, 2011. 127(5): p. e1191-7.
20. Bentley, M.E., H.M. Wasser, and H.M. Creed-Kanashiro, *Responsive feeding and child undernutrition in low- and middle-income countries*. J Nutr, 2011. 141(3): p. 502-7.
21. Hurley, K.M., M.B. Cross, and S.O. Hughes, *A systematic review of responsive feeding and child obesity in high-income countries*. J Nutr, 2011. 141(3): p. 495-501.
22. Ruel, M.T. and H. Alderman, *Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition?* Lancet, 2013. 382(9891): p. 536-51.
23. Grantham-McGregor, S.M., et al., *Effects of integrated child development and nutrition interventions on child development and nutritional status*. Ann N Y Acad Sci, 2014. 1308: p. 11-32.
24. Lopez Boo, F., G. Palloni, and S. Urzua, *Cost-benefit analysis of a micronutrient supplementation and early childhood stimulation program in Nicaragua*. Ann N Y Acad Sci, 2014. 1308: p. 139-48.
25. Gowani, S., et al., *Cost effectiveness of responsive stimulation and nutrition interventions on early child development outcomes in Pakistan*. Ann N Y Acad Sci, 2014. 1308: p. 149-61.

### The way forward on complementary feeding

1. World Health Organization. Dept. of Child and Adolescent Health and Development. *Indicators for assessing infant and young child feeding practices: part 1: definitions*. 2008, Geneva: World Health Organization.

## Annex 1

# Notes on the data

### A. GENERAL NOTE ON THE DATA

Data presented in this report are derived from UNICEF's global databases, which include only data that are internationally comparable and statistically sound. The report draws on nationally representative household surveys such as Multiple Indicator Cluster Surveys (MICS) and Demographic and Health Surveys (DHS). Data presented in this report generally reflect information available as of April 2016. Given the time necessary to collect, analyse and report nationally representative data, the data presented here may not always reflect the current situation. This is especially the case in countries and areas recently experiencing crises, where the situation of children and women can deteriorate rapidly. More detailed information on methodology and data sources is available at <data.unicef.org/nutrition/iycf>.

This report includes the latest population estimates and projections from *World Population Prospects: The 2015 revision* (United Nations, Department of Economic and Social Affairs, Population Division, 2015). Data quality is likely to be adversely affected for countries that have recently suffered disasters, especially where basic country infrastructure has been fragmented or where major population movements have occurred. Efforts have been made to maximize the comparability of statistics across countries and over time. Data presented here are subject to evolving methodologies, revisions of time series data (e.g., calculation of exclusive breastfeeding rates to cover infants aged 0–5 months given definitional change from the previous age group of 0–3 months) and changing regional classifications. Also, data comparable from one year to the next are unavailable for the indicators presented in this report. Averages may fluctuate with the addition of new countries, even within the same time period covered in this report (2010–2016). This is because surveys

can take years before release in some instances. It is therefore not advisable to compare data across UNICEF reports over time. The numbers presented in this report are available online via the UNICEF global statistical databases at <data.unicef.org/nutrition/iycf>. Please refer to this website for the latest data.

### B. NOTE TO THE READER ON INTERPRETING DATA IN THIS REPORT

In the preceding pages, there is a focus on presenting (i) current regional and global estimates; (ii) regional and global trends between 2000 and 2015; and (iii) disparities that may exist between different groups. In many cases, different groups of countries were included within regional and global aggregates for different analyses due to lack of comparable data for all countries for all indicators, across all time periods and disaggregation.

#### Data availability

The conclusions we draw are driven by the data we have available. The analyses in this report are based on a limited number of countries, for a limited number of indicators, and a limited number of background characteristics. Regional and global estimates are presented only when the available data are representative of at least 50 per cent of corresponding regions' population, unless otherwise noted. Many estimates do not include China, as comparable data are often not available in UNICEF databases for this country, especially for the baseline time period of 'around 2000' used in trend analyses as well as disaggregation. For some analyses, re-analysis of raw datasets was required, and therefore only a smaller subset of countries for which such data were available is included. Footnotes in the individual

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\* For a complete list of countries and territories in each region, please see Annex 2.

charts indicate the number of countries used for each analysis.

#### Understanding different measures

In an equity analysis, the measure selected is very important. Different measures can give a different sense of the situation. In a hypothetical example, in two countries, continued breastfeeding among women from the poorest households may be two times as high as in that among women from the richest households (a ratio of 3). However, in the first country the absolute difference between the rates could be just 6 percentage points (poorest = 9 per cent and richest = 3 per cent), whereas in the second country, the absolute difference could be 20 percentage points (poorest = 30 per cent and richest = 10 per cent). Thus, the assessment of differentials between population groups will vary depending on whether absolute or relative differences (or both) are presented. Furthermore, with regard to estimates for different background characteristics, analysis may indicate higher or lower rates for certain groups, but rates may be even higher or lower for other background characteristics that are not available for analysis. These comparisons between different groups are meant to inform the reader as to whether there are differences for a given indicator between, for example, the poorest and the richest households. Because such differences in indicator levels can depend on an array of factors, it is necessary to be aware that comparisons across groups are susceptible to misinterpretation.

#### Confidence intervals

It is important to note that estimates for subpopulations are bracketed by a larger range of uncertainty than aggregate estimates, and thus must be interpreted with caution.

## C. INDICATOR DEFINITIONS

Data presented in this report are based on those collected using the standard infant and young child feeding indicators as defined in WHO's 2008 publication, *Indicators for Assessing Infant and Young Child Feeding Practices*. Data for these indicators are collected through household surveys such as MICS and DHS. With the exception of early initiation of breastfeeding, they are based on questions about liquid and food intake of children aged 0–23 months in the 24 hours preceding the survey. The standard indicator definitions are as follow:

### Early initiation of breastfeeding:

**Numerator:** Children born in the past 24 months put to the breast within one hour of birth

**Denominator:** Children born in the past 24 months

### Exclusive breastfeeding

**Numerator:** Infants 0–5 months of age who received only breastmilk during the previous day

**Denominator:** Infants 0–5 months of age

### Continued breastfeeding at 1 year

**Numerator:** Children 12–15 months of age who received breastmilk during the previous day

**Denominator:** Children 12–15 months of age

### Continued breastfeeding at 2 years

**Numerator:** Children 20–23 months of age who received breastmilk during the previous day

**Denominator:** Children 20–23 months of age

### Introduction of solid, semi-solid or soft foods

**Numerator:** Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day

**Denominator:** Infants 6–8 months of age

### Minimum meal frequency

**Numerator:** Breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum<sup>1</sup> number of times or more during the previous day AND Non-breastfed children 6–23

months of age who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day

**Denominator:** Breastfed children aged 6–23 months AND Non-breastfed children aged 6–23 months

### Minimum dietary diversity

**Numerator:** Children 6–23 months of age who received foods from  $\geq 4$  (out of 7) food groups<sup>2</sup> during the previous day

**Denominator:** Children 6–23 months of age

### Minimum acceptable diet

**Numerator:** Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day AND Non-breastfed children 6–23 months of age who received at least two milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day

**Denominator:** Breastfed children aged 6–23 months AND Non-breastfed children aged 6–23 months

An additional indicator was defined for the purpose of this report in order to avail insight on equity where samples sizes were too small when using the standard indicator definition. Data were re-analysed to generate estimates for the following indicator:

### Continued breastfeeding of children aged 12–23 months

**Numerator:** Children 12–23 months of age who received breastmilk during the previous day

**Denominator:** Children 12–23 months of age

In addition, the MICS, DHS, and some other household surveys, collect data on the liquids and foods consumed in the first three days of life for children who were ever breastfed. Estimates in line with the following definition are presented:

### Breastfed newborns receiving liquids or foods in the first three days of life

**Numerator:** Ever breastfed children born in the past

24 months who received any liquid or food apart from breastmilk in the first three days of life

**Denominator:** Ever breastfed children born in the past 24 months

## D. GLOBAL GOALS AND TARGETS

This report references the following global goals:

### Sustainable Development Goals 2030

The Sustainable Development Goals were adopted alongside the 2030 Agenda for Sustainable Development by United Nations Member States. These goals aim to end poverty, fight inequality and injustice, and tackle climate change by 2030. More detailed information is available at <un.org/sustainabledevelopment>.

### World Health Assembly (WHA) Nutrition Global Targets 2025

The World Health Organization's (WHO) Member States have endorsed global targets for improving maternal, infant and young child nutrition, and are committed to monitoring progress. The targets are vital for identifying priority areas for action and catalysing global change. More information is available at <who.int/nutrition/globaltarget-2025/en/>.

- 1 Minimum is defined as: 2 times for breastfed infants 6–8 months of age; 3 times for breastfed children 9–23 months of age; and 4 times for non-breastfed children 6–23 months of age. "Meals" include both meals and snacks, other than trivial amounts, and frequency is based on caregiver report.
- 2 The four food groups are determined on the basis of the following food groups: (i) grains, roots and tubers; (ii) legumes and nuts; (iii) dairy products (milk, yogurt, cheese); (iv) flesh foods (meat, fish, poultry and liver/organ meats); (v) eggs; (vi) vitamin-A rich fruits and vegetables; (vii) other fruits and vegetables.

## Annex 2

# Regional Classifications

### Eastern and Southern Africa

Angola; Botswana; Burundi; Comoros; Eritrea; Ethiopia; Kenya; Lesotho; Madagascar; Malawi; Mauritius; Mozambique; Namibia; Rwanda; Seychelles; Somalia; South Africa; South Sudan; Swaziland; Uganda; United Republic of Tanzania; Zambia; Zimbabwe

### West and Central Africa

Benin; Burkina Faso; Cabo Verde; Cameroon; Central African Republic; Chad; Congo; Côte d'Ivoire; Democratic Republic of the Congo; Equatorial Guinea; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia; Mali; Mauritania; Niger; Nigeria; Sao Tome and Principe; Senegal; Sierra Leone; Togo

### Middle East and North Africa

Algeria; Bahrain; Djibouti; Egypt; Iran (Islamic Republic of); Iraq; Jordan; Kuwait; Lebanon; Libya; Morocco; Oman; Qatar; Saudi Arabia; State of Palestine; Sudan; Syrian Arab Republic; Tunisia; United Arab Emirates; Yemen

### South Asia

Afghanistan; Bangladesh; Bhutan; India; Maldives; Nepal; Pakistan; Sri Lanka

### East Asia and the Pacific

Brunei Darussalam; Cambodia; China; Cook Islands; Democratic People's Republic of Korea; Fiji; Indonesia; Kiribati; Lao People's Democratic Republic; Malaysia; Marshall Islands; Micronesia (Federated States of); Mongolia; Myanmar; Nauru; Niue; Palau; Papua New Guinea; Philippines; Republic of Korea; Samoa; Singapore; Solomon Islands; Thailand; Timor-Leste; Tonga; Tuvalu; Vanuatu; Viet Nam

### Latin America and the Caribbean

Antigua and Barbuda; Argentina; Bahamas; Barbados; Belize; Bolivia (Plurinational State of); Brazil; Chile; Colombia; Costa Rica; Cuba; Dominica; Dominican Republic; Ecuador; El Salvador; Grenada; Guatemala; Guyana; Haiti; Honduras; Jamaica; Mexico; Nicaragua; Panama; Paraguay; Peru; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago; Uruguay; Venezuela (Bolivarian Republic of)

### Central and Eastern Europe and the Commonwealth of Independent States (CEE/CIS)

Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Georgia; Kazakhstan;

Kyrgyzstan; Montenegro; Republic of Moldova; Romania; Russian Federation; Serbia; Tajikistan; the former Yugoslav Republic of Macedonia; Turkey; Turkmenistan; Ukraine; Uzbekistan

### Other countries outside of these regions

Andorra; Australia; Austria; Belgium; Canada; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Holy See; Hungary; Iceland; Ireland; Israel; Italy; Japan; Latvia; Liechtenstein; Lithuania; Luxembourg; Malta; Monaco; Netherlands; New Zealand; Norway; Poland; Portugal; San Marino; Slovakia; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States

