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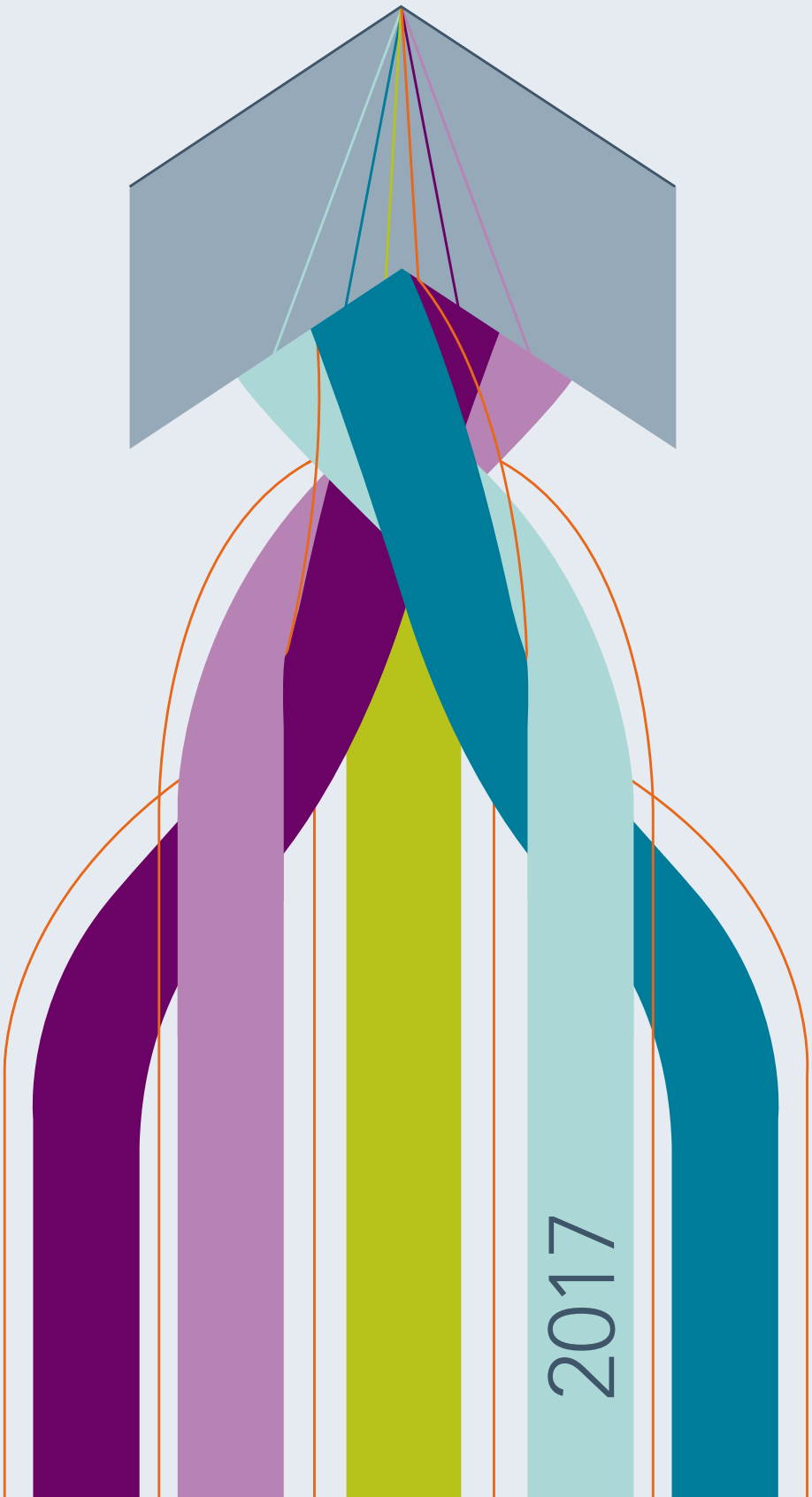
GLOBAL NUTRITION REPORT

Nourishing the SDGs



Endorsements

Akinwumi Adesina, President, African Development Bank

Africa's economic progress is being undermined by hunger, malnutrition and stunting, which cost at least US$25 billion annually in sub-Saharan Africa, and leave a lasting legacy of loss, pain and ruined potential. Stunted children today lead to stunted economies tomorrow. The *Global Nutrition Report* helps us all to maintain focus on and deal with this wholly preventable African tragedy.

Tedros Adhanom, Director-General, World Health Organization

The Sustainable Development Goals include incredible challenges to the world, including an end to hunger and improving nutrition for all people by the year 2030. As the *Global Nutrition Report 2017* demonstrates, universal healthy nutrition is inextricably linked to all of the SDGs, and serves as a foundation for Universal Health Coverage, WHO's top priority. The United Nations Decade of Action on Nutrition presents a unique opportunity to commit to end all forms of malnutrition now!

David Beasley, Executive Director, World Food Programme

The *Global Nutrition Report* confirms why we need to act, because we all stand to benefit from a world without malnutrition. The devastating humanitarian crises in 2017 threaten to reverse years of hard-won nutrition gains, and ending these crises – and the man-made conflicts driving many of them – is the first step to ending malnutrition. Nutrition is an essential ingredient of the Sustainable Development Goals, key to a world with zero hunger. This report makes clear we must all take action – now – to end malnutrition.

José Graziano da Silva, Director-General, Food and Agriculture Organization

The transformational vision of the 2030 Agenda requires renewed effort and innovative ways of working. Ending malnutrition in all its forms is necessary for achieving the 2030 Agenda, as the *Global Nutrition Report 2017* lays out. The Second International Conference on Nutrition recommendations provide the framework within which to act. At the same time, the Decade of Action on Nutrition 2016–2025 provides the platform to move from commitment to action and impact. FAO is committed to supporting countries to transform their food systems for better nutrition. We can be the generation to end hunger and malnutrition.

Anthony Lake, Executive Director, UNICEF

Ending malnutrition is one of the greatest investments we can make in the future of children and nations. As the *Global Nutrition Report 2017* makes clear, good data is key to reaching every child – revealing who we are missing and how we can improve the coverage and quality of essential nutrition interventions for children, adolescents and women. Investing in robust data can help accelerate our progress towards our global nutrition goals – and all the SDG targets.

Sania Nishtar, Founder and President, Heartfile Pakistan

The *Global Nutrition Report 2017* argues on behalf of more than half of the world's population. With more than a third of people living on this planet overweight and obese, over a staggering billion and a half suffering from anaemia and other micronutrient deficiencies, and around 200 million children stunted or wasted, this report is a strong call to action. For sustainable impact, it will be essential for us to take a more holistic view and strive for better nutrition across the entire life course. Political will, partnerships, building on existing policies and developing evidence to inform action are the building blocks. To do this, we must break down siloed ways of working and embrace a multisectoral and multi-stakeholder approach.

Paul Polman, Chief Executive Officer, Unilever

This year's *Global Nutrition Report* focuses on the interdependence of the SDGs, and how progress against one goal generates progress for all. Nowhere are these linkages more evident than in the food agenda. As the producers, manufacturers and retailers of most of the world's food, business has a responsibility to help drive the food system transformation. As a progressive food company, we are committed to helping redesign our global food and agriculture system, to give everyone access to healthy and nutritious food and diets and thereby create a brighter future for all.

Gunhild Stordalen, Founder and President, EAT Foundation

The *Global Nutrition Report* provides a compelling argument for why tackling the challenge of malnutrition in all its forms will be essential to achieving the Sustainable Development Goals. We need to adopt an integrated, cross-sectoral approach, breaking out of the nutrition silo to address the food system challenges holistically. Feeding the growing world population a healthy and sustainable diet is one of our greatest challenges, but as the report shows, the opportunities have never been greater and we can all make a difference.

Gerda Verburg, Coordinator, SUN Movement

Good nutrition is the engine for achieving the Sustainable Development Goals. It is high time for the world to confront the stark reality that hundreds of millions of women, men and their families are still going hungry.
There is no country without a nutrition challenge today. Many countries still face stunting, whereby both physical and brain capacity are irreversibly damaged, while other countries see obesity and non-communicable diseases running rampant. Also, a growing number of countries are facing both challenges – undernutrition during early childhood, and then obesity and non-communicable diseases during the reproductive age. The *Global Nutrition Report* gives us the evidence to act on this injustice. It aids all of us in connecting the dots between the multiple forms of malnutrition and supports SUN Movement member countries in their efforts to make sustainable improvements in people's lives.

This report was produced by an Independent Expert Group empowered by the Global Nutrition Report Stakeholder Group. The writing was a collective effort by the group members, led by the co-chairs and supplemented by additional analysts and contributors.

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Finally, we thank you the readers of the Global Nutrition Report for your enthusiasm and constructive feedback from the *Global Nutrition Report 2014* to today. We aim to ensure the report stays relevant using data, analysis and evidence-based success stories that respond to the needs of your work, from decision-making to implementation, across the development landscape.

development initiatives

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Executive summary

1. The world faces a grave nutrition situation – but the Sustainable Development Goals present an unprecedented opportunity to change that.

A better nourished world is a better world. Yet despite the significant steps the world has taken towards improving nutrition and associated health burdens over recent decades, this year's *Global Nutrition Report* shows what a large-scale and universal problem nutrition is. The global community is grappling with multiple burdens of malnutrition. Our analysis shows that 88% of countries for which we have data face a serious burden of either two or three forms of malnutrition (childhood stunting, anaemia in women of reproductive age and/or overweight in adult women).

The number of children aged under five who are chronically or acutely undernourished (stunted and wasted) may have fallen in many countries, but our data tracking shows that global progress to reduce these forms of malnutrition is not rapid enough to meet internationally agreed nutrition targets, including Sustainable Development Goal (SDG) target 2.2 to end all forms of malnutrition by 2030. Hunger statistics are going in the wrong direction: now 815 million people are going to bed hungry, up from 777 million in 2015. The reality of famines in the world today means achieving these targets, especially for wasting, will become even more challenging. Indeed, an estimated 38 million people are facing severe food insecurity in Nigeria, Somalia, South Sudan and Yemen while Ethiopia and Kenya are experiencing significant droughts. No country is on track to meet targets to reduce anaemia among women of reproductive age, and the number of women with anaemia has actually increased since 2012. Exclusive breastfeeding of infants aged 0–5 months has marginally increased, but progress is too slow (up 2% from baseline). And the inexorable rise in the numbers of children and adults who are overweight and obese continues. The probability of meeting the internationally agreed targets to halt the rise in obesity and diabetes by 2025 is less than 1%.

Too many people are being left behind from the benefits of improved nutrition. Yet when we look at the wider context, the opportunity for change has never been greater. The SDGs, adopted by 193 countries in 2015, offer a tremendous window of opportunity to reverse or stop these trends. They are an agenda that aims to 'transform our world'. Many such aspirational statements have been made in the past, so what makes the SDGs different? The promise can be summed up in two words: *universal* – for all, in every country – and *integrated* – by everyone, connecting to achieve the goals. This has enormous practical implications for what we do and how we do it.

First, it means focusing on inequities in low, middle *and* high-income countries and between them, to ensure that everyone is included in progress, and everyone is counted. Second, it means that the time of tackling problems in isolation is well and truly over. If we want to transform our world, for everyone, we must all stop acting in silos, remembering that people do not live in silos.

We have known for some time that actions delivered through the 'nutrition sector' alone can only go so far. For example, delivering the 10 interventions that address stunting directly would only reduce stunting globally by 20%. The SDGs are telling us loud and clear: we must deliver multiple goals through shared action. Nutrition is part of that shared action. Action on nutrition is needed to achieve goals across the SDGs, and, in turn, action throughout the SDGs is needed to address the causes of malnutrition. If we can work together to build connections through the SDG system, we will ensure that the 2016–2025 Decade of Action on Nutrition declared by the UN will be a 'Decade of Transformative Impact'.

2. Improving nutrition will be a catalyst for achieving goals throughout the SDGs.

Translating this vision of shared action into reality means we all need to know how our work relates to, and can achieve progress across, the other SDGs. There is huge potential for making connections between SDGs, but there is also the potential for incoherence. This is why the SDGs (target 17.14) call for policy coherence for development. A first and necessary step is to map these connections and make them transparent. This is what we begin to do in the *Global Nutrition Report 2017*. Based on the best available evidence, we paint a picture of these connections so we can better understand how to take this agenda forward.

Our analysis shows there are five core areas that run through the SDGs which nutrition can contribute to, and in turn, benefit from:

- sustainable food production
- strong systems of infrastructure
- health systems
- equity and inclusion
- peace and stability.

1 The world faces a grave nutrition situation...

2 billion people lack key micronutrients like iron and vitamin A

155 million children are stunted

52 million children are wasted

2 billion adults are overweight or obese

41 million children are overweight

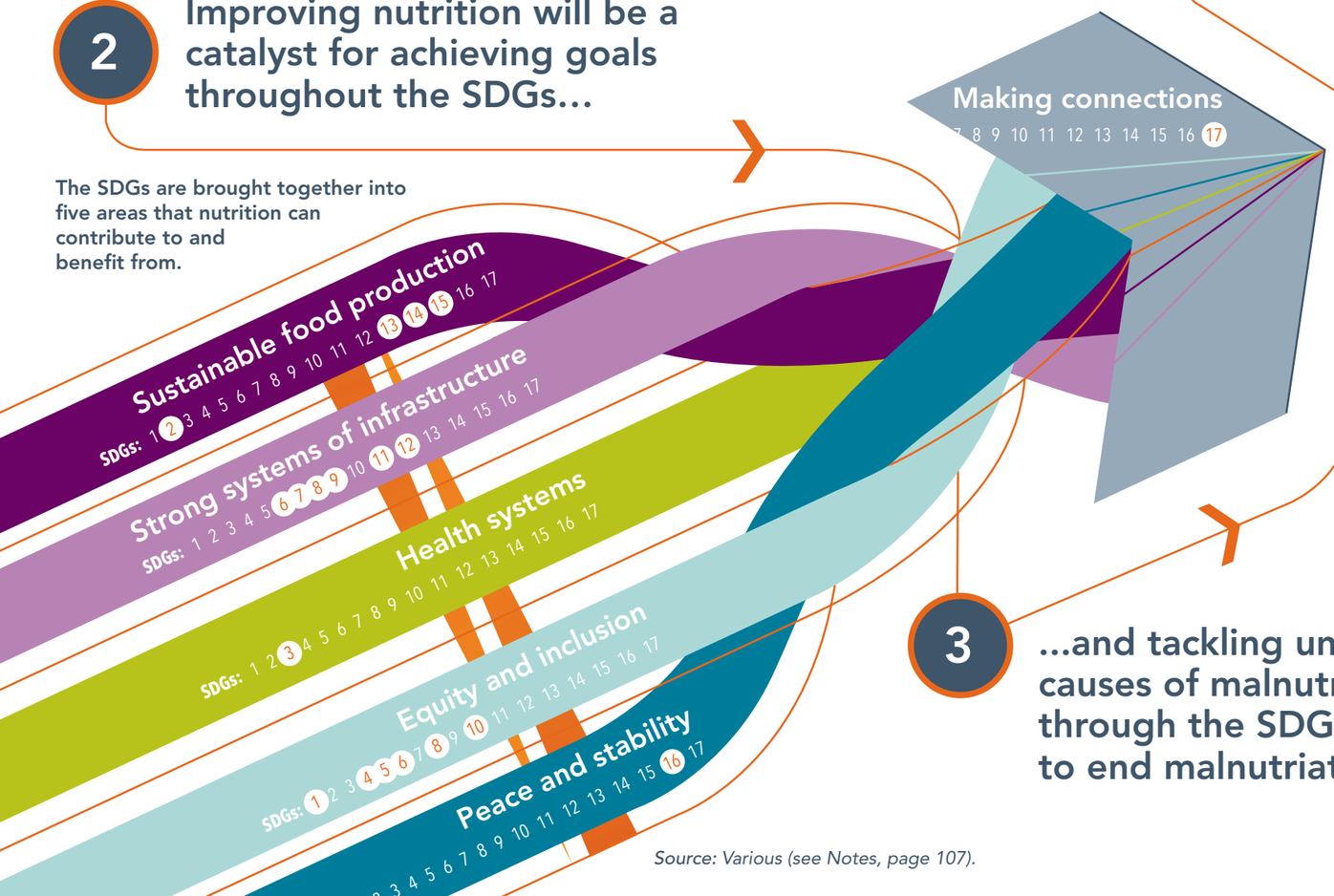
88% of countries face a serious burden of either two or three forms of malnutrition

And the world is off track to meet all global nutrition targets

...but the SDGs present an unprecedented opportunity for universal and integrated change.

2 Improving nutrition will be a catalyst for achieving goals throughout the SDGs...

The SDGs are brought together into five areas that nutrition can contribute to and benefit from.



3 ...and tackling underlying causes of malnutrition through the SDGs will help to end malnutriation.

Source: Various (see Notes, page 107).

4 There is significant opportunity for financing a more integrated approach to improving nutrition universally

Malnutrition has a high economic and health cost and a return of $16 for every $1 invested.

1 in 3 people are malnourished...

0.5% ...but global spending by donors on undernutrition is 0.5% of ODA...

0.01% ...and on NCDs and obesity is 0.01% of global ODA.

The bigger opportunity is for governments and others to invest in nutrition in an integrated way, across sectors that impact nutrition outcomes indirectly, like education, climate change, or water and sanitation.

5 To leave no one behind, we must fill gaps and change the way we analyse and use data

Data gaps are hindering accountability and progress. To improve nutrition universally we need better, more regular, disaggregated data.

6 We must make sure commitments are concrete pledges that are acted on

Deep, embedded political commitment to nutrition will be key to progress. Commitments need to be ambitious and relevant to the problem, leaving no-one behind.

7 There is an exciting opportunity to achieve global nutrition targets while catalysing other development goals

Double duty actions → Tackle more than one form of malnutrition → Will increase the effectiveness and efficiency of investment of time, energy and resources to improve nutrition

Triple duty actions → Tackle malnutrition and other development challenges → Could yield multiple benefits across the SDGs

Ending malnutrition in all its forms will catalyse improved outcomes across the SDGs

Through these five areas, the report finds that improving nutrition can have a powerful multiplier effect across the SDGs. Indeed, it indicates that it will be a challenge to achieve any SDG without addressing nutrition.

1. Good nutrition can drive greater environmental sustainability. Agriculture and food production is the backbone of our diets and nutrition. Food production uses 70% of the world's freshwater supply and 38% of the world's land. Current agriculture practices produce 20% of all greenhouse gas emissions, and livestock uses 70% of agricultural land. Eating better is necessary to ensure that food production systems are more sustainable.

2. Good nutrition is infrastructure for economic development. Stunting disrupts the critical 'grey matter infrastructure' – brain development – that builds futures and economies. Investing in this infrastructure supports human development throughout life and enhances mental and productive capacity, offering a $16 return for every $1 invested. Nutrition is linked to GDP growth: the prevalence of stunting declines by an estimated 3.2% for every 10% increase in income per capita, and a 10% rise in income translates into a 7.4% fall in wasting.

3. Good nutrition means less burden on health systems. Health is indivisible from nutrition. Good nutrition means less sickness and thus less demand on already-stretched health systems to deliver prevention and treatment.

4. Good nutrition supports equity and inclusion, acting as a platform for better outcomes in education, employment, female empowerment and poverty reduction. Well-nourished children are 33% more likely to escape poverty as adults, and each added centimetre of adult height can lead to an almost 5% increase in wage rate. Nutritious and healthy diets are associated with improved performance at school. Children who are less affected by stunting early in their life have higher test scores on cognitive assessments and activity level.

5. Good nutrition and improved food security enhances peace and stability. More evidence is needed to better understand how poor nutrition and food insecurity influence conflict. However, available evidence indicates that investing in food and nutrition resilience also promotes less unrest and more stability.

3. Tackling the underlying causes of malnutrition through the SDGs will unlock significant gains in the fight to end malnutrition.

Nutrition is an indispensable cog without which the SDG machine cannot function smoothly. We will not reach the goal of ending malnutrition without tackling the other important factors that contribute to malnutrition. Poor nutrition has many and varied causes which are intimately connected to work being done to accomplish other SDGs.

1. Sustainable food production is key to nutrition outcomes. Agricultural yields will decrease as temperatures increase by more than 3°C. Increased carbon dioxide will result in decreased protein, iron, zinc and other micronutrients in major crops consumed by much of the world. Unsustainable fishing threatens 17% of the world's protein and a source of essential micronutrients. Policies and investments to maintain and increase the diversity of agricultural landscapes are needed to ensure small and medium-sized farms can continue to produce the 53–81% of key micronutrients they do now.

2. Strong systems of infrastructure play key roles in providing safe, nutritious and healthy diets and clean water and sanitation. The infrastructure that makes up 'food systems' that take food from farm to fork is essential if we are to reduce the 30% of food that is currently wasted and the contamination of food which leads to diarrhoea and underweight and death among young children. With unclean water and poor sanitation associated with 50% of undernutrition, infrastructure is needed to deliver them, equitably. Special attention is needed in cities. Urban populations are predicted to reach 66% by 2050, yet slums and deprived areas are underserved, while infrastructure has made it easier to deliver foods that increase the risk of obesity and diet-related non-communicable diseases (NCDs).

3. Health systems have an important role in promoting infant and young child feeding, supplementation, therapeutic feeding, nutrition counselling to manage overweight and underweight, and screening for diet-related NCD in patients. Yet our analysis shows that health systems are not delivering where they should – only 5% of children aged 0–59 months who need zinc treatment are receiving it, for example. And half of all countries have not implemented NCD management guidelines. Essential nutrition actions with substantive evidence should be scaled to ensure they are reaching those who need it the most, and interventions for diet-related NCDs tested to see what works most effectively through the health system.

4. Equity and inclusion matter for nutrition outcomes: ignoring equity in the distribution of wealth, education and gender will make it impossible to end malnutrition in all its forms. A fifth of the global population – 767 million people – live in extreme poverty and 46% of all stunting falls in this group. This group is often neglected or excluded. At the same time, measures must be put into place to counteract the risk of growing obesity as economies develop. It is estimated that a 10% rise in income per capita translates into a 4.4% increase in obesity, while national burdens of obesity are rising at lower levels of economic development. Severe food insecurity remains a problem across the world – from 30% in Africa to 7% in Europe. Actions to ensure women are included and treated equitably are needed to ensure they can breastfeed and look after their own nutrition.

5. Peace and stability are vital to ending malnutrition. The proportion of undernourished people living in countries in conflict and protracted crisis is almost three times higher than that in other developing countries. Long-term instability can exacerbate food insecurity in many ways. In the worst-case scenario, conflicts can lead to famines. When conflict or emergencies occur, nutrition must be included in disaster risk reduction and post-conflict rebuilding.

4. There is significant opportunity for financing a more integrated approach to improving nutrition universally.

Malnutrition has a high economic and health cost, yet not enough is spent on improving nutrition. New analysis this year shows domestic spending on undernutrition varies from country to country, with some spending over 10% of their budget on nutrition and others far less. Global spending by donors on undernutrition increased by 1% (US$5 million) between 2014 and 2015, but fell as a *proportion* of official development assistance (ODA) from 0.57% in 2014 to 0.50% in 2015. Spending on prevention and treatment of obesity and diet-related NCDs represented 0.01% of global ODA spending to all sectors in 2015, even though the global burden of these diseases is huge. Some donors are leading the way in bucking this trend, but considerably more investment needs to be put on the table.

The bigger opportunity is for governments and others to invest in nutrition in an integrated way. Our analysis this year already shows that governments spend more on sectors important in the underlying causes of malnutrition than they do on interventions specific to nutrition. Opportunities through innovative financing mechanisms and existing investment flows for multiple wins in multiple sectors need to be explored. The world simply cannot afford *not* to think about a more integrated approach to investing in nutrition.

5. To leave no one behind, we must fill gaps and change the way we analyse and use data.

The Global Nutrition Report has consistently called for more rigorous data collection to ensure accountability. This year we highlight that data gaps are hindering accountability and progress. To improve nutrition universally, we need better, more regular, detailed and disaggregated data. We identify lack of data disaggregated by wealth quintile, gender, geography, age and disability as a particular barrier. National averages are not enough to see *who is being left behind*. We need disaggregated data for *all forms of malnutrition*, in *all countries* as nutritional levels can vary even within households. This is needed if we are to ensure that marginalised, vulnerable populations are not left behind in the SDG agenda.

Two notable data gaps are around adolescents and dietary intake. Better data on adolescents is needed if we are to hold the world accountable for tackling nutrition in such a critical part of the life course. Likewise, if we do not know what people are eating, we will not be able to design effective interventions to improve diets.

Beyond just collecting data, we need to actively use this data to make better choices and inform and advocate decision-making at the policy level. We need data to be collected, collated and used to build the dialogues, partnerships, actions and accountability needed to end malnutrition in all its forms.

6. We must make sure commitments are concrete pledges that are acted on.

Without deep political commitment to nutrition rooted in the way governments govern, multilateral agencies coordinate, civil society engages and businesses are run, the act of making pledges to improve nutrition becomes nothing more than empty rhetoric.

Accountability mechanisms, such as the Global Nutrition Report, are designed to ensure that stated commitments are delivered in practice. The commitments made to the Nutrition for Growth (N4G) process in 2013 aimed to generate deep commitment. It has made progress. Of the 203 commitments made at the N4G Summit in 2013, 36% are either on track (n=58) or have already been achieved (n=16). Yet the N4G process shows we need to do better. To begin with this means ensuring we can hold governments, multilateral agencies, civil society and businesses accountable for delivering their commitments – and this means making sure they are SMART (specific, measurable, achievable, relevant and time-bound). Commitments must be ambitious and relevant to the problem. Also critical are commitments that aim to achieve multiple goals and ensure no one is left behind.

The bottom line is that nutrition needs some staying power. We need a world where having suboptimal nutrition is considered completely unacceptable and good nutrition is the global social norm. Accountability mechanisms should be designed carefully to ensure they promote this deeper level of commitment by all stakeholders.

7. There is an exciting opportunity to achieve global nutrition targets while catalysing other development goals through 'double duty' and 'triple duty' actions.

No country has been able to stop the rise in obesity. Countries with burgeoning prevalence should start early to avoid some of the mistakes of high-income neighbours. There is an opportunity to identify – and take – 'double duty' actions which tackle more than one form of malnutrition at once. These will increase the effectiveness and efficiency of investment of time, energy and resources to improve nutrition. For example, actions to promote and protect breastfeeding in the workplace produce benefits for both sides of the double burden of malnutrition; city planning can be leveraged to ensure access to affordable, safe and nutritious foods in underserved areas and discourage the provision of foods which raise the risk of obesity; making clean water available in communities and settings where people gather reduces the risk of undernutrition and provides a viable alternative to sugary drinks; universal healthcare packages can be redesigned to include both undernutrition and diet-related NCD prevention; and tracking of aid spending can be improved to monitor the financing of the double burden more effectively.

To begin with, programme and policy implementers and funders concerned with undernutrition should review their work and ensure that they are taking opportunities to reduce risks of obesity and diet-related NCDs where they can, while ensuring we do not reverse the progress made on tackling undernutrition. They should do this review in the next 12 months. Researchers, meanwhile, should work to identify the evidence of where and how these 'double duty' approaches can work most effectively.

Likewise, 'triple duty actions' which tackle malnutrition and other development challenges could yield multiple benefits across the SDGs. For example, diversification of food production landscapes can provide multiple benefits by: ensuring the basis of a nutritious food supply essential to address undernutrition and prevent diet-related NCDs; enabling the selection of micronutrient-rich crops with ecosystem benefits; and, if the focus is on women in food production, empowering women to become innovative food value chain entrepreneurs while minimising work and time burden. Scaling up access to efficient cooking stoves would improve households' nutritional health, improve respiratory health, save time, preserve forests and associated ecosystems, and reduce greenhouse gas emissions. School meal programmes could be more effectively structured to reduce undernutrition, ensure children are not unduly exposed to foods that increase risk of obesity, provide income to farmers, and encourage children to stay in school and/or learn better when at school. Urban food policies and strategies can be designed to reduce climate change, food waste, food insecurity and poor nutrition. Humanitarian assistance could be used as a platform to promote quality, nutritious diets while also rebuilding resilience via local institutions and support networks.

Overall, there is an immense opportunity to achieve the SDGs through greater interaction across silos. This means we must all transform our ways of working. There needs to be a critical step-change in how the world approaches nutrition. It is not just about more money; it is also about breaking down silos and addressing nutrition in a joined-up way. Governments, business and civil society: you must think about what the connections across the SDGs mean for the investment and commitments you make and the actions you take. Then act by identifying one triple duty action and make delivering it a priority.

Changing the way we work also means that the nutrition community must transform the way it speaks to other sectors. We must reach out to ask others "what can we do to help you?" "how can we help you achieve your goals?", and not just say "you should be helping us." To make us stronger, the different communities who work on nutrition – on undernutrition, obesity, diet-related NCDs, maternal and child health and humanitarian relief – must come together with a stronger voice. And we must put people at the centre of everything we do, by inspiring and rallying around this fundamental right that impacts every single one of us and our families.

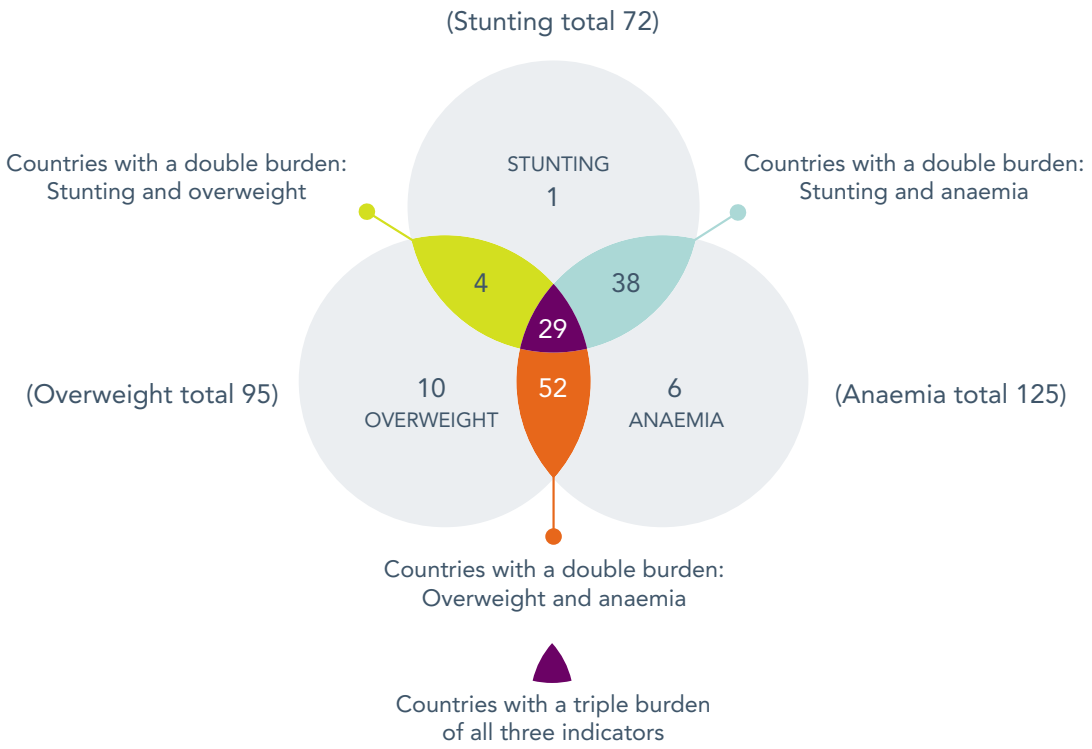
If readers take away one message from this report, it should be that ending malnutrition in all its forms will catalyse improved outcomes across the SDGs. Whoever you are, and whatever you work on, you *can* make a difference to achieving the SDGs, and you *can* help end malnutrition. You can stop the trajectory towards at least one in three people suffering from malnutrition. The challenge is huge, but it is dwarfed by the opportunity.

1 A transformative agenda for nutrition: For all and by everyone

The world has taken significant steps towards improving nutrition over recent decades but the job is far from done. The number of children who are chronically undernourished, or stunted, has fallen in many countries, as has the number of children who are acutely malnourished, or wasted. However, the burden remains high and undernutrition rates have not fallen fast enough to keep pace with changing global trends. Obesity remains a significant challenge, with increasing numbers of both children and adults who are overweight and obese.

Malnutrition overall remains an immense and universal problem, with at least one in three people globally experiencing malnutrition in some form (Figure 1.2).[1] No country is immune: almost every country in the world is facing a serious nutrition-related challenge. The 140 countries with data to track childhood stunting, anaemia in women of reproductive age and overweight in adult women show that countries experience multiple burdens of malnutrition (Figure 1.1). All 140 are dealing with at least one of these major nutritional problems. And 123 (88%) of these countries face a grave burden of either two or three of these forms of malnutrition.[2]

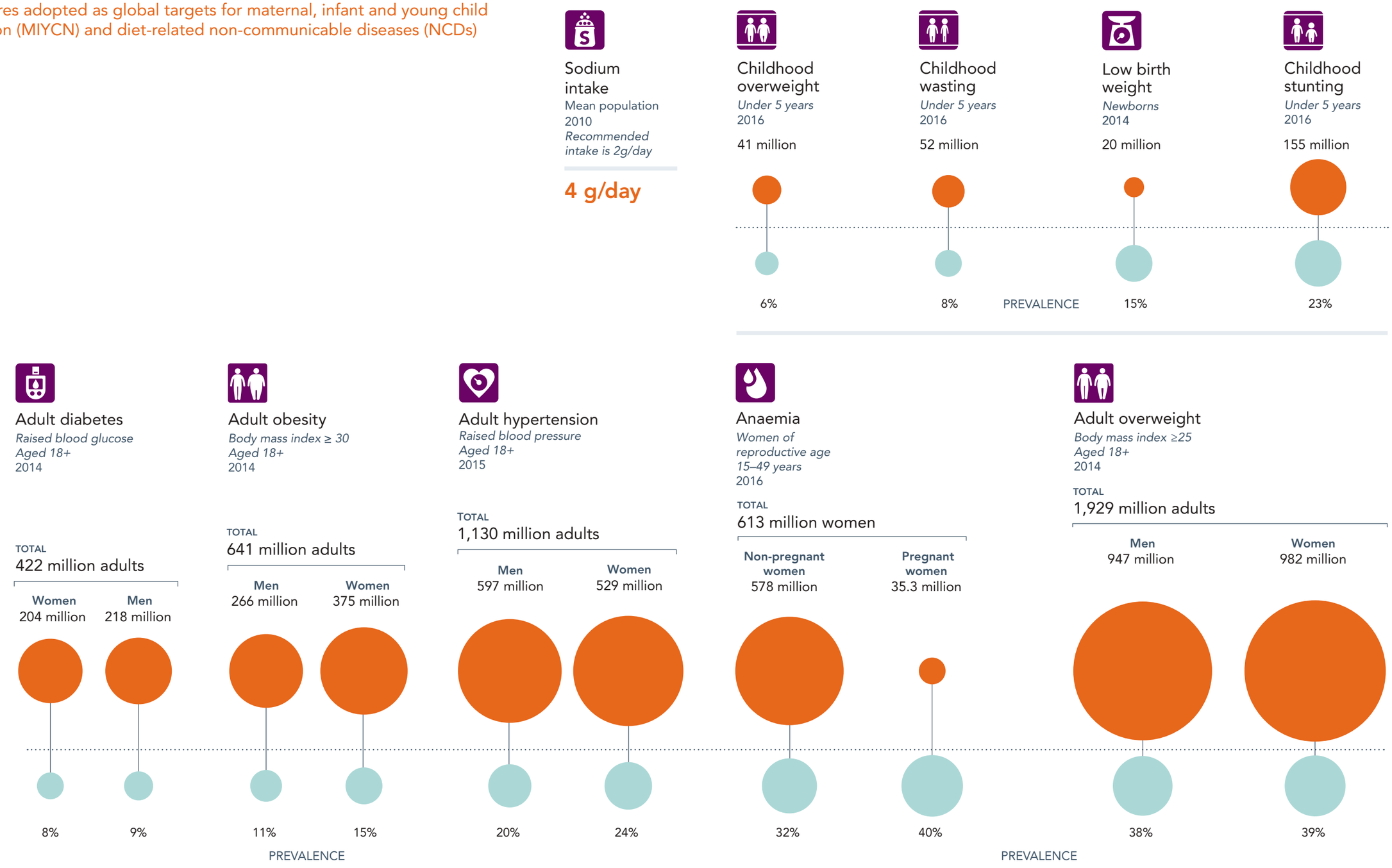
FIGURE 1.1: Number of countries facing burdens of malnutrition



Source: Authors' analysis based on data from United Nations Children's Fund (UNICEF)/World Health Organization (WHO)/World Bank Group Joint Child Malnutrition Estimates, 2017; WHO, 2017a; WHO, 2017b.[3]

Note: 72 countries have stunting burden (1 with stunting only; 38 with stunting and anaemia; 4 with stunting and overweight; and 29 with stunting, overweight and anaemia). 125 countries have anaemia burden (6 with anaemia only; 38 with anaemia and stunting; 52 with anaemia and overweight; 29 with anaemia, stunting and overweight). 95 countries have overweight burden (10 with overweight only; 52 with overweight and anaemia; 4 with overweight and stunting; 29 with overweight, anaemia and stunting).

FIGURE 1.2: Global statistics for the nutritional status and behavioural measures adopted as global targets for maternal, infant and young child nutrition (MIYCN) and diet-related non-communicable diseases (NCDs)



Source: *UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017; WHO 2017; UNICEF 2016; WHO Global Health Observatory data repository and NCD Risk Factor Collaboration; Mozaffarian et al, 2014; Zhou B et al, 2017*[4]

Notes: **Disaggregation conducted by WHO 2017*[5] *and sex-specific numbers are not available. Note: Raised blood glucose is defined as fasting glucose ≥7.0 mmol/L, on medication for raised blood glucose or with a history of diagnosis of diabetes; raised blood pressure is defined as raised blood pressure, systolic and/or diastolic blood pressure ≥140/90 mmHg. Prevalence is the proportion of the population reaching the target.*

On top of this, famines are exacerbating malnutrition among millions of people throughout the world today[6] (Figure 1.3). A staggering 38 million people are severely food insecure in the four countries where famines have been declared – (northern) Nigeria, Somalia, South Sudan and Yemen – plus Ethiopia and Kenya, who are also struggling with drought-like conditions. In these same places 1.796 million children under five have severe acute malnutrition while 4.960 million have moderate acute malnutrition.[7] To make matters worse, the Food and Agriculture Organization (FAO) recently indicated that the number of people without access to adequate calories in the world has increased since 2015, reversing years of progress.[8] And the number of chronically undernourished people in the world is estimated to have increased to 815 million, up from 777 million in 2015.[9]

FIGURE 1.3: Food insecurity and malnutrition in famines and droughts, figure from July 2017

Source: UNICEF. Famine Response. Progress Update (11 July 2017). New York: UNICEF, 2017.[10]

But there is hope and commitment to end all forms of malnutrition. While we can always learn more, we have extensive evidence on the causes and consequences of malnutrition, and what we can do to prevent and address it. In addition, movements and governments have scaled up efforts to fight malnutrition at multiple levels with different types of commitments. These commitments to reduce malnutrition have been made through national-level policies and plans, and increased funding allocated from governments but from donors as well.

International processes and global goal setting has also ramped up. In 2015, the Sustainable Development Goals (SDGs) included a target to end malnutrition in all its forms (target 2.2) and other nutrition-related targets (e.g. target 3.4). The Nutrition for Growth (N4G) Compact, the follow-up to the UN High-Level Meeting on Non-communicable Diseases (NCDs) and the Decade of Action on Nutrition 2016–2025 are all important political processes for nutrition commitments and accountability.

Transforming nutrition through the SDGs

Recognising the importance of improving nutrition, in 2015 the 193 countries of the United Nations included a target (2.2) to end malnutrition in all its forms in the SDGs. The SDGs aim to 'transform our world' with a vision that can be summed up in two words: universal – for all, in every country – and integrated – by everyone, connecting to achieve all the goals.[11] The same prerequisites apply to all the SDGs. As put by the UN General Assembly resolution 70/1: *Transforming our world: the 2030 Agenda for Sustainable Development*:[12]

"

On behalf of the peoples we serve, we have adopted a historic decision on a comprehensive, far-reaching and people-centred set of *universal* and transformative Goals and targets...

We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path. As we embark on this collective journey, we pledge that *no one will be left behind*...

This is an Agenda of unprecedented scope and significance. It is accepted by all countries and is *applicable to all*, taking into account different national realities, capacities and levels of development and respecting national policies and priorities. These are *universal goals and targets* which involve the entire world, developed and developing countries alike. They are *integrated and indivisible* and balance the three dimensions of sustainable development...

The *interlinkages and integrated nature* of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realised. If we realise our ambitions across the full extent of the Agenda, the lives of all will be profoundly improved and our world will be transformed for the better.

(Italics have been added for emphasis.)

"

This offers a transformative vision for nutrition. Everyone should have the right to good nutrition, and everyone should be involved in achieving it. We know from decades of experience that both *universality* and *integration* are fundamental to improving nutrition outcomes. To begin with, malnutrition is universal: it is not confined to one group of countries or one set of people (Spotlight 1.1). Every country, whether rich or poor, is grappling with some form of malnutrition. Even countries with lower levels of malnutrition have pockets of poverty and inequity associated with malnutrition. So ending malnutrition in all its forms means leaving no one behind – ensuring everyone is included in progress and everyone is counted.

And to achieve that, to truly address malnutrition, will require an integrated approach (Spotlight 1.2). Evidence shows that actions delivered through the 'nutrition sector' alone can only go so far. It is estimated, for example, that delivering the 10 interventions[13] that tackle stunting directly would only reduce stunting globally by 20%.[14] Actions need to address the root causes of poor nutrition – issues which are dealt with by the other SDGs.[15]

SPOTLIGHT 1.1 WHAT IS 'UNIVERSALITY' IN THE SDGS AND WHAT DOES IT MEAN FOR NUTRITION?

Judith Randel

Universality means 'for all'. The SDG universality agenda recognises the shared nature of challenges which are common to many people across all countries. A universal approach to nutrition means recognising the different expressions of poor nutrition, most obviously from obesity to underweight, and ensuring policies are in place to address these. It means that businesses and institutions, governments and non-governmental organisations (NGOs) need to be sensitive to who is missing out on progress in their own communities. And they must embrace their responsibility to work to prevent them being left further behind.

The universality agenda is about knowing who is included in progress and who is missing out. Prevalence (proportion of the population) data and national averages are not enough. They can mask very different levels of burden and progress. To deliver on the universality agenda, each country has to count people; it has to know *who* and *where* its population is. While that might seem obvious and basic, the data suggests that one-third of children worldwide have not even had their birth registered. Among the poorest children, this rises to two-thirds.[16] Data must be disaggregated so that it reveals who is being reached and who is missed out. This is a big challenge, but as a first step, there are proposals for a set of minimum disaggregations covering wealth quintile (one of five income groups), gender, geography, age and disability.[17]

Universality is not just about data and delivery, it is also about culture change. It recognises the 21st century world, where the old categories of 'developed' or 'developing', 'North' or 'South' are less and less relevant. Looking through a universal lens creates opportunities for learning about what works across different societies and making faster, more comprehensive, equitable and inclusive progress.

SPOTLIGHT 1.2 WHAT IS 'INTEGRATION' IN THE SDGS AND WHAT DOES IT MEAN FOR NUTRITION?

Corinna Hawkes

Integrated means that all the goals should be achieved in an indivisible way 'by everyone' – by people making connections across all sectors and all parts of society. One aspect of integration has long been recognised as important in nutrition, NCDs and health more broadly: **multi/inter-sectorality**. That is, actions taken by 'other' sectors to support (in this case) nutrition and health goals.[18] In the 1970s, the recognition that nutrition was "everybody's business but nobody's responsibility" led to the concept of 'multisectoral nutrition planning'.[19] In the 2000s the term 'mainstreaming nutrition' was used to describe how nutrition interventions should become an integral part of other development priorities, like poverty reduction, maternal and child health and agriculture.[20] Since 2013, the term 'nutrition sensitive' has been used to describe programmes in other sectors that address the underlying causes of malnutrition.[21]

A second aspect of integration has been recognised in nutrition more recently: **policy coherence**. The need for policy coherence was acknowledged as important during the 2014 Second International Conference on Nutrition.[22] In 2017, the World Health Organization (WHO) held a Global Conference on NCDs focused on coherence between different spheres of policymaking. In these cases, policy coherence refers to policies across governments actively supporting, rather than undermining, nutrition or NCD objectives. In development more broadly, policy coherence has been discussed for far longer, and it has been primarily concerned with ensuring domestic and foreign policies support the goals of developing countries.[23] The SDGs take policy coherence far further. Through target 17.14 on policy coherence for sustainable development, the SDGs call on all of government, as well as civil society and the private sector, to consider links between different sectors, across borders and between generations to achieve their goals.[24]

This broader approach – recognising multiple levels of *interaction* – is at the core of the 'integrated' vision of the SDGs: delivering multiple goals through shared action. It means everyone getting involved with not just their 'own' goal, but delivering outcomes across the SDGs. This is the aspect of integration that raises the bar for action in nutrition and across development. All the SDGs interact in different ways.[25] While tools have been developed to support countries and other stakeholders to develop integrated SDG plans, there is a long way to go to implement actions that leverage these interactions.[26] But there is also an opportunity to think and act differently. For nutrition, it is an opportunity to show how improving people's nutrition can be catalyst for the SDGs as a whole – and to work harder to put that vision into practice.

Truly addressing nutrition also involves thinking about all the different forms of malnutrition. While each form is very different, there are shared root causes (Spotlight 1.3). Yet to date, they have typically been dealt with in silos. An integrated view calls for double wins in the actions we take, through what the *Global Nutrition Report 2015* first termed 'double duty' actions. These are interventions, programmes and policies that have the potential to simultaneously reduce the risk or burden of both undernutrition and overweight, obesity or diet-related NCDs.[27] In the *Global Nutrition Report 2017* we also consider the potential for 'triple duty' actions, which aim to achieve additional goals based on common agendas (Chapter 3).

The SDGs raise the bar to deliver on all forms of malnutrition, for all, and by everyone – acknowledging the interactions between nutrition and development goals more broadly. A momentous shift is needed to move this agenda. It necessitates new thinking, approaches and action, and brings challenges that we will need to overcome.[28]

For example:

- For universality, we often do not know *who is left behind* – this information is often missed in national averages and prevalence rates. Even household-level data does not reveal inequalities between different household members whether based on gender, age, disability, caste, tribe, race or other status.[29] While children need special protection and attention, there is little reliable and consistent data for children older than 5 years, or adolescents outside the 15–19 age range. Hence whole populations are being left behind because nutrition data is not systematically collected (Spotlight 1.1).
- For integration, we do not know *how best to do it*.[30] While some countries are taking steps to embed the SDGs across governments,[31] very few national SDG reports include sections on how integration will be operationalised at the country level.[32] Efforts are being made to integrate sectors and stakeholders through new initiatives and governance structures. Yet, national governments, researchers, NGOs, companies and the UN system still work in silos. With so many sectors involved, the "biggest misbelief is that someone else will fix it."[33]

Despite these challenges, we must seize the opportunity of the 'for all and by everyone' agenda. This is a unique opportunity to ensure the Decade of Action on Nutrition 2016–2025, declared by the 193 countries of the UN, becomes a 'Decade of Transformative Impact'. The nutrition decade is the time to catalyse the efforts of *all* of us to end all forms of malnutrition as part of the SDG agenda while also contributing to broader development goals.[34]

This must also recognise that everyone has a right to adequate nutrition. Rights related to nutrition have been directly recognised and protected in a range of human rights treaties. The 1979 Convention on the Elimination of All Forms of Discrimination Against Women underlines women's right to health, including "adequate nutrition during pregnancy and lactation". Meanwhile the 1989 Convention on the Rights of the Child obliges governments to "combat disease and malnutrition, including within the framework of primary healthcare, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods."[35] Stakeholders are increasingly recognising that a human rights-based approach to nutrition is vital for ensuring that everyone can enjoy the intrinsic benefits of good nutrition.

Yet delivering rights requires accountability. Accountability matters for nutrition – it is vital for achieving this ambitious agenda. Good accountability encourages and enables action. It is about accepting responsibility for those commitments, delivering them for impact, and then reporting on the commitments.

Accountability means exercising power responsibly.

The Global Nutrition Report has been working to enhance accountability for action on nutrition since 2014. In the context of the transformative vision presented by the SDGs, the *Global Nutrition Report 2017* again takes stock of the state of the world's nutrition and explores what is needed to achieve universal outcomes through integrated delivery. It does so in four ways:

1. **Monitoring progress towards achieving nutrition targets, universally.**

   The Global Nutrition Report tracks national progress against globally agreed targets for maternal, infant and young child nutrition (MIYCN) and those relevant to diet-related NCDs, as well as the SDG 2.2 and 3.4 targets on nutrition. This year we also identify the gaps in data and the way it is used that are curbing our ability to track progress towards universal improvements. That is, ending malnutrition in all its forms by 2030, in *all* countries, for *all* people (Chapter 2).

2. **Setting out what connecting nutrition across the SDGs looks like.**

   This year we provide the basis for acting on nutrition in a more integrated way to achieve targets across the SDGs. Chapter 3 explores if and how improved nutrition has the capacity to be a catalyst for the SDGs more broadly – and what actions are needed throughout the SDGs to ensure global nutrition targets are reached. It exemplifies the kind of 'double duty' and 'triple duty' actions we can take.

3. **Tracking financing as a means of implementing a universal and integrated vision.**

   Financing is critical to delivering action: SDG 17 positions financing as a 'means of implementation'. Chapter 4 provides the latest data on financing for nutrition by governments and key donors, highlighting which key areas across the SDGs need more investment, and where the finance data gaps are.

4. **Reflecting on progress on commitments made at the Nutrition for Growth Summit.**

   In this year's report, we track the commitments made in the Nutrition for Growth ('N4G') process – a movement to bring diverse global stakeholders together to invest in fighting malnutrition. We aim to show what has been achieved over the last four years towards their commitments made to 2020. And we reflect on the implications for commitments needed to take forward the universal and integrated agenda to achieve a Decade of Transformative Impact for nutrition (Chapter 5).

SPOTLIGHT 1.3 SHARED CAUSES OF DIFFERENT FORMS OF MALNUTRITION[36]

Corinna Hawkes, Alessandro Demaio and Francesco Branca

In line with the demands of the SDGs to articulate frameworks to integrate different problems and goals, we can identify some shared causes of different forms of malnutrition. These are articulated in two WHO policy briefs published in 2017: *The Double Burden of Malnutrition* and *Double-duty actions for nutrition*.[37]

Epigenetics

Altering the expression of genes (switching them on or off) is thought to influence the risk of low birth weight, overweight, obesity and NCDs. These alterations can be caused by environmental factors such as diet, exercise, drugs and chemical exposure. This in turn leads to intergenerational links in undernutrition, obesity and NCDs. For example, intrauterine growth restriction resulting from maternal undernutrition leads to changes in the way the infant's body then regulates energy.

Early-life nutrition

The quality and quantity of nutrition during fetal development and infancy impact on the body's immune function, cognitive development and regulation of energy storage and expenditure. For example, by providing essential nutrients for growth and development, colostrum and breast milk influences infant biology and nutritional habits. Another link is through poor maternal nutrition before and during pregnancy, which can lead to increased risk of maternal anaemia, preterm birth and low infant birth weight. In turn, low-birth weight infants can be at higher risk of metabolic disease and abdominal obesity later in life.

Socioeconomic factors

Socioeconomic factors such as poverty, gender empowerment and education affect all forms of malnutrition in different ways (Chapter 3). For example, income and wealth inequalities are closely associated with undernutrition. More complex inequality patterns for obesity and associated health conditions are seen in low and middle-income countries, and depend on the economic and epidemiological development and state of the country. In general, the shift towards obesity in groups of lower socioeconomic status is happening more quickly in lower income countries than it did in higher income countries.

People's surroundings

The quality of environments around people are relevant to all forms of malnutrition. For example, lack of availability of nutritious foods in the 'food environments' around people can affect the risks of both an inadequate and unbalanced diet. Other important aspects of people's surroundings are the living and working environments that affect access to improved water and sanitation services, and influence the ability to breastfeed, and the built environment that impedes or promotes physical activity.

Food systems

Underpinning what people eat and their food environments are food systems. They include the production of food in agriculture (including horticulture and raising livestock, small animals and fish), how food is transformed and processed through the system, its distribution and trade and how it is made available to people through retail and other means. Food systems play a crucial role in what people eat and whether they are at risk of undernutrition or obesity.

The Global Nutrition Report is only as strong as its uptake. We need our audience and partners to use the evidence we present here to call for swifter progress, and to hold decision-makers and implementers accountable for their actions. We see this report as an intervention: we rely on you – our partners from governments, donors, business, civil society and academia to use it to catalyse more effective action on nutrition, and to take this conversation further. Everyone has a role to play.

- **If you are a decision-maker, budget holder or implementer**, use this report as inspiration for integrated action on nutrition. Use the approaches in this report, and beyond, to tackle the current and future threats of malnutrition which your country, sector or community faces. Use this report to improve your ability to deliver universally and leave no one behind. Use this report as inspiration to increase your impact on both nutrition outcomes and broader development outcomes, and increase your 'bang for your buck'.[38]
- **If you are an advocate**, use this report to shine a light on the nutrition challenges your country, sector or community faces. Use it to hold people in positions of power accountable for tackling all forms of malnutrition in an integrated manner, leaving no one behind. Use it to advocate for filling the gaps in data and the way it is used which make accountability so challenging.
- **If you are a researcher**, consider whether the data and research gaps identified in this report could inform your future work. Consider how we can dig deeper into data to analyse how greater integration can be achieved and find and rectify the situation of those being left behind.

We call on everyone reading this report to take action to ensure that the global nutrition targets are achieved and the Decade of Action on Nutrition is a 'Decade of Transformative Impact'. And not just one for nutrition, but one in which nutrition acts as a catalyst to achieve development goals across all countries, for all and by everyone.

2 Monitoring progress in achieving global nutrition targets

Key findings

1. Overall, the world is off course to meet global nutrition targets:
   - Global progress to reduce stunting among children under age five is not rapid enough to meet the 2025 target. The number of children under age five who are overweight is rising.
   - The rate of reduction of childhood wasting is also not fast enough to meet the 2025 target. Famines, brewing conflicts and climate-induced droughts, floods and other disasters will make wasting much harder to tackle.
   - Exclusive breastfeeding of infants aged 0–5 months has marginally increased (up 2% from baseline). This progress is positive but too slow.
   - Anaemia among women of reproductive age has increased since 2012; no country is on course to meet the target.
   - The probability of halting the rise in obesity and diabetes by 2025 is less than 1%.
2. At a regional level, the number of children who are stunted is increasing in Africa, and wasting is still high in South Asia.
3. At a country level, no nation is on course to meet all five of the six global maternal and child nutrition targets, and few have stopped the upward trends in child and adult overweight and obesity. Three countries are 'on course' for four targets – exclusive breastfeeding and childhood stunting, wasting and overweight.
4. Data gaps remain a significant obstacle in tracking progress of the multiple burdens of malnutrition, universally. Disaggregated data is needed to ensure no one is left behind due to their geography, age, ethnicity or gender. This data is missing, as is data on adolescents and dietary intake.
5. Better data coordination and its interpretation and use by decision-makers as part of national priority setting is also needed to track progress against global nutrition targets.

What will it take to end malnutrition universally by 2030 – in all its forms, in all countries, for all people? What is needed to navigate the way towards achieving the two Sustainable Development Goal (SDG) targets, 2.2 and 3.4, that are directly concerned with nutrition outcomes?

This chapter describes where we are globally and nationally in reaching what can be termed the 'global nutrition targets.' It uses available country-level prevalence data to determine, as best as we can, who is impacted by undernutrition, overweight/obesity and diet-related non-communicable diseases (NCDs), and where. It also highlights where data gaps are preventing us from taking on a more universal approach to tracking improvements in nutrition across the world.

Global nutrition targets

Progress towards the SDG targets can be tracked using the voluntary global nutrition targets adopted by member states of the World Health Organization (WHO). The Global Nutrition Report has been tracking these global nutrition targets over the last four years. These targets comprise:

- **maternal infant and young child nutrition (MIYCN) targets**: six global targets on MIYCN adopted at the World Health Assembly in 2012 to be attained by 2025[1]
- **diet-related NCD targets**: three of nine NCD targets adopted at the World Health Assembly in 2013 to be attained by 2025.[2]

These 'MIYCN targets' and 'diet-related NCD targets' overlap significantly with SDG targets 2.2 and 3.4 (Figure 2.1), highlighting the synergies between the SDGs and current tracking efforts to tackle malnutrition. While each target is separate and distinct, they are integrated through basic underlying links which show that nutritional status is the result of many factors that come together into an indivisible whole in a person (Spotlight 1.2, Chapter 1).

The MIYCN targets have the overarching aim of improving MIYCN by 2025 and are tracked at the global level by six indicators. The diet-related NCD targets form part of the Global Monitoring Framework for the Prevention and Control of NCDs, which sets targets to monitor progress in achieving targets concerning the four NCDs that cause the greatest amount of mortality, three of which have diet-related causes (cardiovascular disease, diabetes, some cancers), and their risk factors.

The WHO plays a key leadership role in monitoring the MIYCN and diet-related NCD targets and aligning them closely with the UN Decade of Action on Nutrition (2016–2025).[3] It has also provided guidance for countries to set their own national targets in line with their priorities and resource capacity to address both MIYCN and NCDs. These are the Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition[4] and the Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020.[5] The targets and indicators are tracked annually in the Global Nutrition Report to instil accountability in the global nutrition community. These targets and indicators are shown in Figure 2.1.

Global and country progress towards global nutrition targets

The monitoring and assessments presented in this year's report show that at the global level, the world is off course to meet most of the global nutrition targets for which data is available (Figure 2.2). The analyses presented supersede numbers given in previous Global Nutrition Reports. This is because they take into account new data available in the last year which reflects improved methodologies and more robust estimates (see Spotlight 2.2 and Appendix 1).

FIGURE 2.1: Global targets and indicators to improve nutritional status and behaviours

NUTRITION-RELATED 2025 TARGETS ADOPTED BY THE MEMBER STATES OF THE WORLD HEALTH ORGANIZATION

Maternal, infant and young child nutrition (MIYCN) targets

TARGET 1	**Achieve a 40% reduction in the number of children under 5 who are stunted**
Under-5 STUNTING	Stunting* among children under 5 years of age
TARGET 2	**Achieve a 50% reduction of anaemia in women of reproductive age**
ANAEMIA	Women aged 15–49 years with haemoglobin <12 g/dL (non-pregnant) or <11 g/dL (pregnant)
TARGET 3	**Achieve a 30% reduction in low birth weight**
LOW BIRTH WEIGHT	Infants born with a birth weight <2,500 g
TARGET 4	**Ensure that there is no increase in childhood overweight**
Under-5 OVERWEIGHT	Overweight** among children under 5 years of age
TARGET 5	**Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%**
EXCLUSIVE BREASTFEEDING	Infants 0–5 months of age who are fed exclusively with breast milk
TARGET 6	**Reduce and maintain childhood wasting to less than 5%**
Under-5 WASTING	Wasting*** among children under 5 years of age

NCD Global Monitoring Framework

TARGET 4	**Achieve a 30% relative reduction in mean population intake of salt (sodium chloride)**
POPULATION INTAKE OF SALT	Age-standardised mean population intake of salt (sodium chloride) in g/day in persons aged 18+ years
TARGET 6	**Achieve a 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances**
ADULT HYPERTENSION	Age-standardised prevalence of raised blood pressure among persons aged 18+ years, by sex
TARGET 7	**Halt the rise in diabetes and obesity**
ADULT DIABETES	Age-standardised prevalence of raised blood glucose/diabetes among persons aged 18+ years, or on medication for raised blood glucose, by sex
ADULT OVERWEIGHT	Age-standardised prevalence of overweight and obesity[+] in persons aged 18+ years, by sex
ADULT OBESITY	Age-standardised prevalence of obesity[++] in persons aged 18+ years, by sex

CORRESPONDING SUSTAINABLE DEVELOPMENT GOALS 2030

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

TARGET 2.2	**By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons**
Under-5 STUNTING	2.2.1 Prevalence of stunting among children under 5 years of age
Under-5 WASTING *Under-5* OVERWEIGHT	2.2.2 Prevalence of wasting and overweight among children under 5 years of age

Goal 3. Ensure healthy lives and promote well-being for all at all ages

TARGET 3.4	**By 2030, reduce by one-third premature mortality from NCDs through prevention and treatment and promote mental health and well-being**
	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease

Source: *Authors, based on World Health Organization (WHO) and UN Statistical Division.*[6]

Notes: **Stunting is defined as length or height-for-age z-score more than 2 standard deviations below the median of the WHO Child Growth Standards. **Childhood overweight is defined as weight-for-length or height z-score more than 2 standard deviations above the median of the WHO Child Growth Standards. ***Wasting is defined as weight-for-length or height z-score more than 2 standard deviations below the median of the WHO Child Growth Standards. [+]Overweight and obesity is defined as body mass index (BMI) ≥25. [++]Obesity is defined as BMI ≥30.*

FIGURE 2.2: Global progress towards global nutrition targets

INDICATOR	TARGET	BASELINE YEAR	BASELINE STATUS	TARGET FOR 2025	ON OR OFF COURSE	COMMENTS
Maternal, infant and young child nutrition targets						
Under-5 STUNTING	TARGET 1: 40% reduction in the number of children under 5 who are stunted	2012	162 million	~100 million	OFF COURSE	Current average annual rate of reduction (AARR) (2.3%) below required AARR (4%).
Under-5 WASTING	TARGET 6: Reduce and maintain childhood wasting at less than 5%	2012	8%	<5%	OFF COURSE	Global prevalence 7.7% in 2016.
Under-5 OVERWEIGHT	TARGET 4: No increase in childhood overweight	2012	7%	No increase in prevalence	OFF COURSE	The baseline proportion for 2012 was revised to 5.7% in the estimates for 2015, and the current prevalence is 6%, marginally above this threshold and therefore off course.
ANAEMIA	TARGET 2: 50% reduction of anaemia in women of reproductive age	2012	29%	15%	OFF COURSE	Global prevalence 32.8% in 2016. (Baseline proportion for 2012 was revised to 30% in 2016. Current prevalence reflects increase since then).
LOW BIRTH WEIGHT	TARGET 3: 30% reduction in low birth weight	2008 TO 2012	15%	10%		New estimates are forthcoming
EXCLUSIVE BREAST-FEEDING	TARGET 5: Increase the rate of exclusive breastfeeding in the first six months to at least 50%	2008 TO 2012	38%	≥50%	Some progress	In 2016, 40% of infants 0–5 months were exclusively breastfed. An increase of two percentage points over 4 years reflects very limited progress.

OFF COURSE

INDICATOR	TARGET	BASELINE YEAR	BASELINE STATUS	TARGET FOR 2025	ON OR OFF COURSE	COMMENTS
Nutrition-related NCD targets						
ADULT OVERWEIGHT	TARGET 7: Halt the rise in prevalence	2014	Men 38% Women 39%	Halt the rise in prevalence	OFF COURSE	
ADULT OBESITY	TARGET 7: Halt the rise in prevalence	2014	Men 11% Women 15%	Halt the rise in prevalence	OFF COURSE	Probability of meeting the global target is almost zero based on projections to 2025.
ADULT DIABETES *Raised blood sugar*	TARGET 7: Halt the rise in prevalence	2014	Men 9% Women 8%	Halt the rise in prevalence	OFF COURSE	Probability of meeting the global target low (<1% for men, 1% for women) based on projections to 2025.
ADULT HYPERTENSION *Raised blood pressure*	TARGET 6: 25% relative reduction or no rise in prevalence, according to national circumstances	2014	Men 24% Women 20%	Men 18% Women 15%	Not yet available	Projections not yet available.
POPULATION INTAKE OF SALT *Sodium chloride*	TARGET 4: 30% relative reduction in mean intake	2010	Mean sodium intake 4g/day	Mean sodium intake 2.8g/day	Not yet available	Projections not yet available.

OFF COURSE

Source: Authors, based on WHO, 2012, 2014, NCD Risk Factor Collaboration, 2016, Stevens GA et al, 2013, Zhou B et al, 2017 and UNICEF, 2016.[7]

Country progress towards global nutrition targets

At the national level, assessing country progress towards achieving the global nutrition targets clearly shows that there are many data gaps holding back our ability to make robust assessments for four targets: stunting, wasting, overweight and exclusive breastfeeding (Figure 2.3). However, several countries are on course or making some progress towards these. We present country-level data on prevalence, current and required rates of change (where applicable), and an assessment of progress towards global nutrition targets on our website. The data presented in its tables is also used in the Global Nutrition Report's online Nutrition Country Profiles (see Spotlight 2.1), which show progress alongside other indicators related to malnutrition and its determinants.

- **For improving MIYCN:** Based on available data, 18 countries are on course to meet the stunting target, 29 are for wasting, 31 for overweight and 20 for exclusive breastfeeding. No country is on course to reduce anaemia among women of reproductive age (Figure 2.3). Sadly, the figures also highlight the lack of data to make robust assessments of progress towards MIYCN targets, meaning many countries cannot be classified as on or off course.
- **For halting the rise in obesity:** All countries for which data is available had a probability of less than 0.5 (50% chance) of meeting the 2025 target and thus are off course to meet obesity targets if upward trends in obesity continue unabated.
- **For halting the rise in diabetes:** Eight countries had a probability of at least 0.5 of meeting the 2025 target among men: Australia, Belgium, Denmark, Finland, Iceland, Nauru, Singapore and Sweden. These are all high-income countries, except Nauru, an upper-middle-income country in Oceania. Across Asia, Africa, Latin America and North America, most countries will fail to stem the rise in diabetes among men unless something changes. Progress in halting the rise in diabetes among women is slightly better: 26 countries have a probability of at least 0.5 of meeting the target. These are Andorra, Australia, Austria, Belgium, Brunei Darussalam, Canada, Democratic People's Republic of Korea, Denmark, Finland, France, Germany, Iceland, Israel, Italy, Japan, Luxembourg, Malta, Nauru, Netherlands, Norway, Portugal, Republic of Korea, Singapore, Spain, Sweden and Switzerland.

SPOTLIGHT 2.1 GLOBAL NUTRITION REPORT'S NUTRITION COUNTRY PROFILES

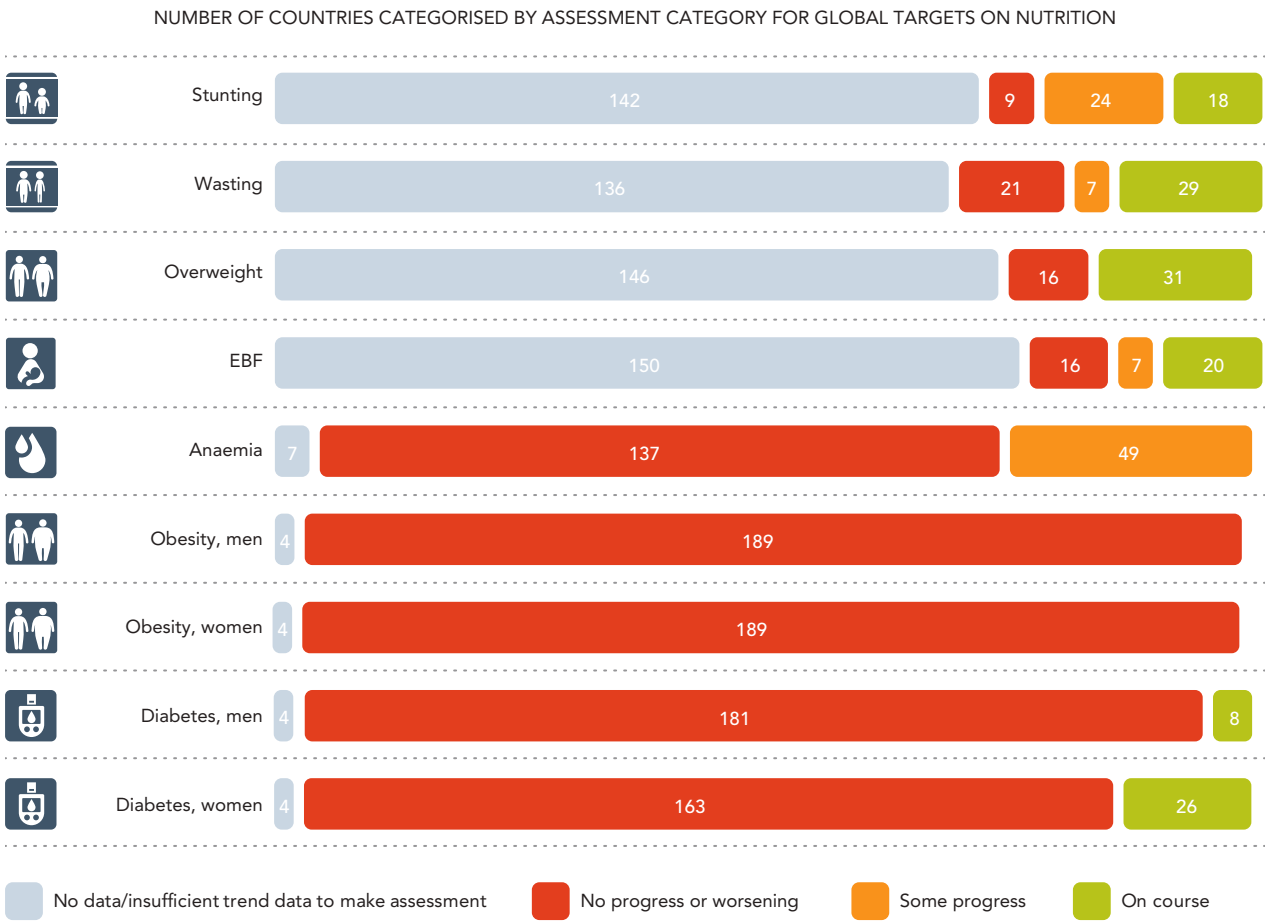
Komal Bhatia and Tara Shyam

The Global Nutrition Report publishes online Nutrition Country Profiles for each of the 193 UN countries. These have been refreshed in 2017 with new data where available, and align with the data used in this year's report. The two-page documents provide a snapshot of over 80 indicators of nutrition status and determinants, food availability, intervention coverage and policies that support good nutrition for each of the 193 countries, as well as for the 6 regions and 22 sub-regions.

The profiles are designed to help users easily view and assess data, or the lack of it, on progress in reducing malnutrition for a selected geography. They enable nutrition champions to not only advocate for greater action for nutrition, but also support the work of other sectors. The profiles can also help those working in related sectors to see shared objectives and challenges, identify ways to integrate nutrition in your work, and leverage the multiplier effect that improved nutrition can have in furthering your goals.

The data used in the profiles is collated from publicly available datasets provided by numerous agencies. Survey data is used where available and methodologically sound, and modelled estimates are used elsewhere if relevant. While other credible datasets may be available at the country level, those included in the profiles are compatible with internationally agreed standards, allowing for consistency and comparability across countries. For more information on the sources and definitions of the data used in the profiles, see the technical notes on the Nutrition Country Profiles page of the Global Nutrition Report website, where a link to the underlying dataset used to compile individual profiles can also be found.[8]

FIGURE 2.3: Progress towards global nutrition targets by number of countries in each assessment category, 2017



Source: *Authors using data from UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017, Stevens GA et al, 2013 and NCD Risk Factor Collaboration, 2017.*[9]

Notes: *N=193. Some targets are excluded from analysis as data needs further strengthening or methodological work before they can be used: low birth weight, adolescent obesity, hypertension and salt intake. Data on anaemia among women of reproductive age is based on modelled estimates; only 30 countries have at least one survey point after baseline (2012). See Appendix 1 and Spotlight 2.2 for more information.*

SPOTLIGHT 2.2 METHODS TO TRACK GLOBAL AND COUNTRY PROGRESS
Komal Bhatia

The methods used to assess global and country progress towards MIYCN nutrition targets are based on revised methodologies developed by WHO and the United Nations Children's Fund (UNICEF) Technical Expert Advisory Group on Nutrition Monitoring (TEAM).[10] They are different to those used in the *Global Nutrition Report 2016*. The rules to track progress towards diet-related NCD targets have also been modified based on new data available and methodological considerations. These methodological changes present some challenges in maintaining continuity and making comparisons with assessments in previous reports. Yet the added value of having more refined and robust rules to make fair and considered assessments far outweigh the drawbacks.

Country-level assessments aim to make informed judgements for countries that have adequate data of high quality collected frequently. They endeavour to reserve any unfair critique based on very old prevalence data or highly unstable estimates of rate of change which could lead to incorrect conclusions about progress. Rather, the lack of sufficient data at country level should spur action to collect better and more frequent data to aid action and accountability.

The Global Nutrition Report aims to assess progress in relation to the baseline and/or target years ('endline') as far as possible rather than compare status to the previous year of reporting. This allows us to take into account longer-term data trends using all available information.

Appendix 1 gives full details of the new methods used to assess progress towards global nutrition targets – you are encouraged to refer to it to understand how assessments were made.

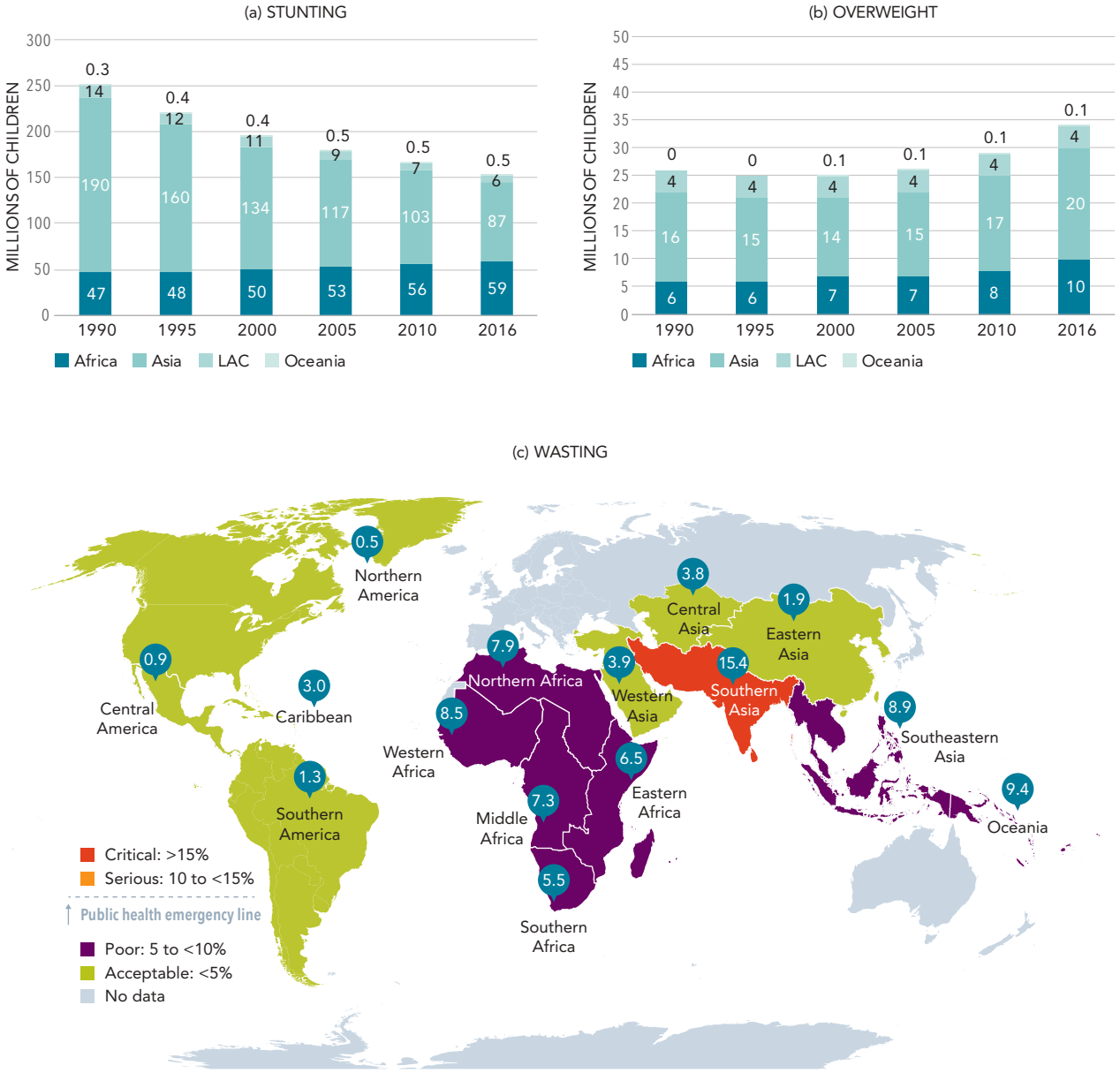
Prevalence and distribution of malnutrition across regions

In thinking about universality, it is important to examine the prevalence of the malnutrition burden, where it exists and among which sub-populations within countries. Even better would be to have subnational, deeper disaggregated-level data to ensure that no one is left behind. These data gaps are discussed in the section *Data needs for tracking progress towards universal outcomes* (Page 24).

Malnutrition among children

The number of children affected by stunting globally has decreased drastically since 1990. But trends have varied across regions, with the rate of decline being unequal across regions and sub-regions. Africa is the only region that has seen an *increase* in the number of children stunted despite a decrease in the prevalence of stunting. Together, Africa and Asia account for nearly all the global burden of stunting (Figure 2.4a). In 2016, two of every five of the world's stunted children and more than half of all wasted children lived in South Asia. Over the same period, the number of children under age 5 who are overweight has increased dramatically worldwide (Figure 2.4b), with 40.6 million overweight in 2016.[11] And more than 15% of children under age 5 in South Asian countries were wasted in 2016 (27.6 million, Figure 2.4c). This represents a critical public health emergency (as prevalence more than 10% does) and reflects a serious and pressing problem.

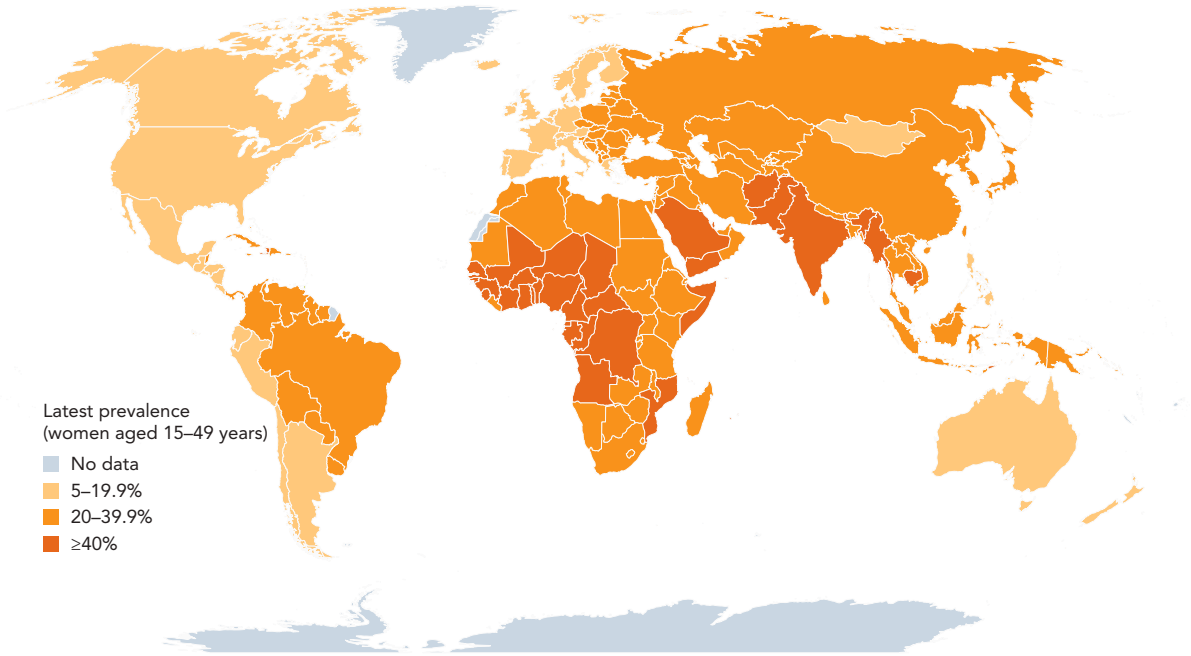
FIGURE 2.4: Children under 5 affected by a) stunting (1990–2016), b) overweight (1990–2016) and c) wasting (2016) by region



Source: *Map reproduced from UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017.*[12]

Notes: *Europe and North America were not included in the figures because of a lack of data in the database (see also following section). Estimates for Asia exclude Japan, and for Oceania exclude Australia and New Zealand. LAC: Latin America and the Caribbean.*

FIGURE 2.5: Prevalence of anaemia among women aged 15–49 years by country, 2016



Source: Map reproduced from the World Health Organization Global Targets 2025 Tracking Tool.[13]

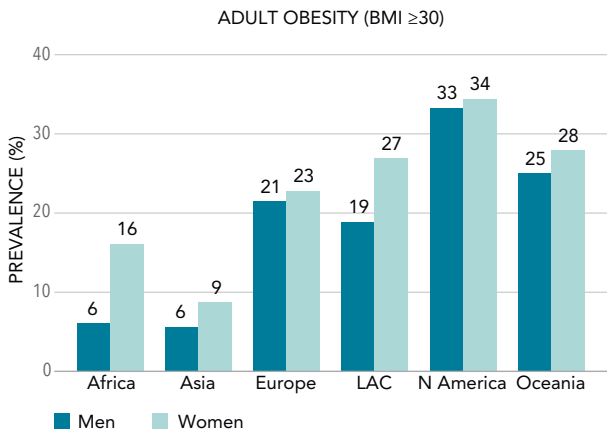
Malnutrition among adults

Globally, 614 million women aged 15–49 years were affected by anaemia. India had the largest number of women impacted, followed by China, Pakistan, Nigeria and Indonesia. In India and Pakistan, more than half of all women of reproductive age have anaemia. It is a global issue that many women in high-income countries also suffer from; prevalence rates may be as high as 18% in countries such as France and Switzerland (Figure 2.5).

As Figure 2.6 shows, obesity (body mass index (BMI) ≥30) is most common among North American men (33%) and women (34%), and lowest among Asian and African men (6%) and Asian women (9%). Overweight and obesity are increasing in almost every country and are a real concern in many low and middle-income countries, not just high-income ones. The problem affects more women than men in all the world's regions, reflecting a wider global gender disparity.

Diabetes or raised blood glucose is most common (10%) among Asian men and Latin American women, and lowest (6%) among European and North American women (Figure 2.7). Regional averages for raised blood pressure among adult men and women aged over 18 years in 2015 are shown in Figure 2.8. Hypertension is most common (28%) among African women and European men, and lowest (11%) among North American women. A quarter of Asian and Latin American men suffered from raised blood pressure in 2015. While more women worldwide are affected by obesity, the case for diabetes and hypertension is mixed. There is more diabetes among men than women in Asia, Europe, Northern America and Oceania, and more hypertension among men than women in all regions except Africa (Figure 2.8).

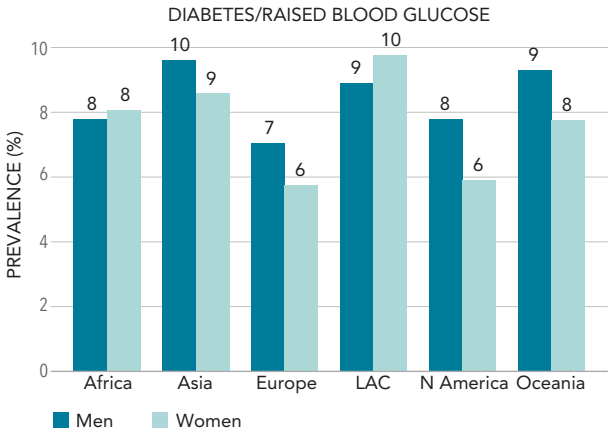
FIGURE 2.6: Prevalence of obesity (BMI ≥30) among adults aged 18 years and over by region, 2014



Source: Authors based on data from the World Health Organization Global Health Observatory data repository and NCD Risk Factor Collaboration.[14]

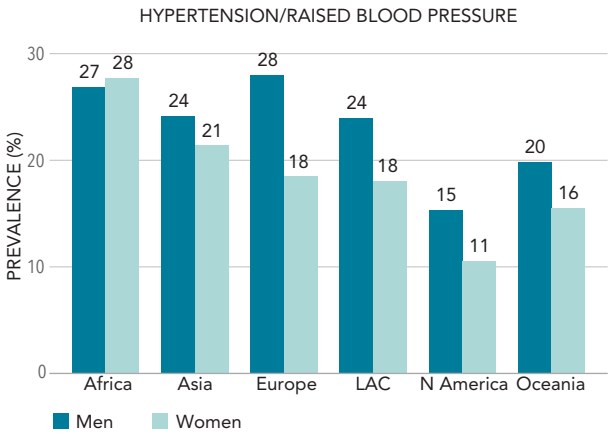
Notes: Population-weighted means for 189 countries. LAC: Latin America and the Caribbean.

FIGURE 2.7: Prevalence of diabetes among men and women aged 18 years and over by region, 2014



Source: Authors based on data from the World Health Organization Global Health Observatory data repository and NCD Risk Factor Collaboration, 2016, 2017.[15]

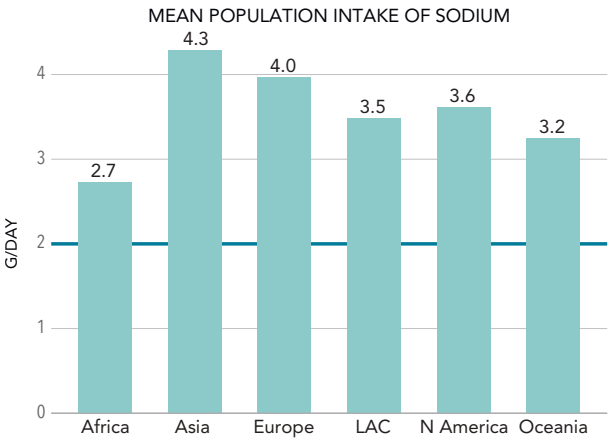
FIGURE 2.8: Prevalence of hypertension among men and women aged 18 years and over by region, 2015



Source: Authors based on data from the World Health Organization Global Health Observatory data repository, Zhou B et al, 2017 and NCD Risk Factor Collaboration, 2017.[16]

Notes: Population-weighted means for 189 countries. LAC: Latin America and the Caribbean.

FIGURE 2.9: Mean intake of sodium by region, 2010

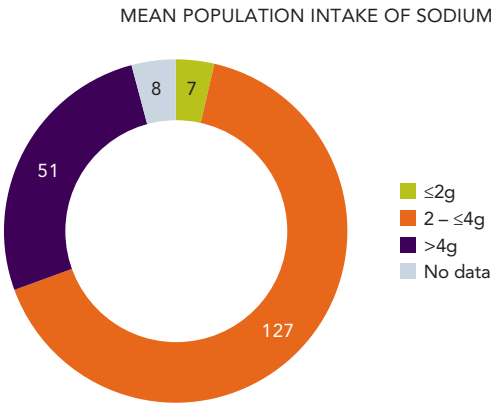


Source: Authors based on data from Mozaffarian D et al, 2014 and Powles J et al, 2013.[17]

Notes: Population-weighted means for 185 countries. Blue reference line refers to World Health Organization-recommended intake of 2 g/day.[18] *LAC: Latin American and the Caribbean.*

The world consumes too much salt (Figure 2.10). Intake varies by region but no region had intakes within the WHO-recommended limits of 2 g/day of sodium (Figure 2.9). Asia has the highest intake (4.3 g/day of sodium), followed by Europe (4.0 g/day of sodium). At national level, only seven countries (Burundi, Comoros, Gabon, Jamaica, Kenya, Malawi and Rwanda) have sodium intakes within desirable limits.

FIGURE 2.10: Mean intake of sodium in 193 countries by intake band, 2010



Source: Authors, based on data from Mozaffarian D et al, 2014 and Powles J et al, 2013.[19]

Notes: Data is for 2010.

Data needs for tracking progress towards universal outcomes

This chapter, along with part of every Global Nutrition Report, tracks progress against the country-level and global nutrition targets. But the universality agenda will not be achieved without filling data gaps. Some of these gaps are about reporting on outcomes, but others are to do with adequate coverage of key interventions themselves, and ensuring that these interventions reach those in need. Appendix 2 shows how countries are doing in reaching their populations with the 'essential nutrition actions' – interventions for undernutrition delivered primarily through the health system. Previous Global Nutrition Reports have, for example, highlighted the lack of data reporting on low birth weight[20] and how data gaps vary across indicators.[21] This year's report highlights that data is simply not available from most countries to track the MIYCN targets (Figure 2.3).

In the context of universality, these data challenges are hampering the ability to track universal outcomes. And if we cannot track universal outcomes, we cannot hold the world accountable for achieving them as part of the SDG agenda. These challenges include the following, which are then discussed in turn:

1. knowing who is included in progress (and who is not) so we can track progress against leaving no one behind. This requires disaggregated data
2. knowing how well high-income countries (as well as low and middle-income countries) are doing, so to ensure all countries are included
3. knowing what progress has been made in addressing risk factors for nutrition (such as dietary intake data or behavioural risk factors) across sectors, to ensure integration (see Chapter 3).

Challenge 1: Knowing who is included (and who is being left behind)

To track progress for universal outcomes, we need to know who is being counted and who is not. Prevalence data and national averages are not enough. They can mask very different levels of burden and progress (Spotlight 1.1, Chapter 1). Disaggregated data is needed to identify where and what types of burdens exist and who is being left behind to better understand why countries are on or off course. Data collection should be disaggregated subnationally and geographically, and across wealth quintiles, national or social origin, race, ethnicity and gender. This is to ensure we are objectively understanding inclusion and potentially exclusion while promoting accountability to various vulnerable populations. The *Global Nutrition Report 2016* highlighted three aspects of disaggregation important for promoting accountability:

- **Disaggregation by socioeconomic and demographic characteristics**: An analysis of subnational patterns in stunting rates using Demographic and Health Surveys (DHS) datasets. This emphasises the wide variations in malnutrition rates by wealth, education, age of mother at birth, residence and sex.[22]
- **Disaggregation by specific populations**: Research including data from Save the Children's 'Group-based Inequality Database' (GRID) database.[23] This shows that children's nutrition outcomes are lower than average if they are girls, refugees, displaced or disabled or from a regionally disadvantaged area in a country or an excluded ethnic group.[24] It indicates that data is needed for specific populations, with one outstanding need being data on nutrition among adolescents (Spotlight 2.3). Adolescent girls are at a critical stage in development – not yet adults but soon to be fully grown adults and potential future parents. Their health and nutritional status is key to not only their own adult well-being but for their potential offspring. Many adolescents – girls and boys – are also affected by obesity. Yet adolescents' nutritional problems receive limited attention in global monitoring frameworks.
- **Spatial disaggregation**: Nutritional status by subnational region. There are wide variations in this status, leading to demand by decision-makers for spatially disaggregated data. Awareness of these vast differences is essential for national plans of action and for the effective allocation of resources yet examples of finely detailed maps for undernutrition are rare.[25] Spatial disaggregation has the potential to identify other causes and factors that influence malnutrition such as infrastructure – rural and urban planning through for example roads and markets, conflict hotspots, migration patterns and natural resource access disparities (also see Chapter 3).

Challenge 2: Knowing the status of high-income countries

The *Global Nutrition Report 2015*[26] noted that many high-income countries are missing data that should be included in the Global Nutrition Report Nutrition Country Profiles (24% for Western Europe to 34% for Eastern Europe). Even though high-income countries have greater capacity to produce this data than other countries, they represent major gaps in international databases. Failing to provide internationally comparable data risks their credibility as global partners, especially since the SDG agenda calls for action from every country.

Some indicators are less relevant to high-income contexts, such as vitamin A supplementation and use of oral rehydration salts, but others are relevant including child anthropometry (body measurement) and antenatal visits. This data is collected but often uses different methodologies, is limited to what is in private clinics and hospitals and is not reported to international or central databases. Some countries use their own national standards rather than international standards, such as the WHO Child Growth Standards.

Challenge 3: Knowing what progress has been made in addressing risk factors

The *Global Nutrition Report 2015* noted that data on risk factors is among that in "strikingly short supply across countries",[27] including data on dietary intake of infants and young children and on metabolic and behavioural risk factors for diet-related NCDs. It is crucial that we work to close these data gaps if we are to reduce reliance on modelled estimates.

The lack of data on dietary intake is a particularly glaring gap given that diet quality is a common factor underlying different forms of malnutrition. The Global Panel on Agriculture and Food Systems for Nutrition in 2016[28] concluded that "Our ability to describe diets is hampered by fragmented and incomplete data". To track the role of diet in contributing to global nutrition targets, we need more and better quality dietary intake data. Spotlight 2.4 highlights the need for more data as well as better measures of dietary intake.

It is vital to realise that data has many uses beyond simply tracking it. For a real data revolution in nutrition, there needs to be better use of the data that is collected to create a more responsive information system for nutrition that enables double and triple duty actions. Spotlight 2.5 highlights the need for a 'nutrition data revolution' that uses the entire data value chain – prioritisation, collection, curation, analysis, interpretation and decision-making.

SPOTLIGHT 2.3 THE CRITICAL IMPORTANCE OF FILLING DATA GAPS TO TRACK NUTRITION IN ADOLESCENTS

Komal Bhatia

Nutritional status during adolescence impacts adult health and reproductive outcomes. Adolescence (typically seen as around 10 to 19 years) and youth (around 15 to 24 years) are important stages of the human life course. Poor nutrition during these stages can perpetuate the intergenerational cycle of malnutrition; it can negate the cumulative benefits of good nutrition accrued in infancy and early life.[29] Moreover, adolescents may experience high rates of underweight or overweight, often also accompanied by micronutrient deficiencies. For example, in Latin America, national estimates of obesity in adolescents (12–19 years) range from 16.6% (16.5 million people) to 35.8% (21.1 million).[30] But adolescence also presents a window of opportunity to improve nutrition and future adult health and reproductive outcomes of the world's 1.2 billion adolescents. It brings a chance to invest in nutrition interventions that can address their nutritional outcomes.[31] Investing US$4.6 per capita annually over the course of the SDGs in interventions to improve adolescents' physical, sexual and mental health would bring an average benefit-to-cost ratio of 10.[32]

The nutritional status, behaviours and outcomes of adolescents form a very small part of global monitoring frameworks for nutrition. The only targets that address adolescent nutrition directly are the MIYCN target to reduce anaemia among women of reproductive age (15–49) and the diet-related NCD target to halt the rise in obesity. While the obesity target includes an indicator for adolescent obesity, the anaemia target does not look at anaemia in adolescents separately. Beyond these, indicators are largely missing. Process and behavioural indicators related to fruit and vegetable consumption, physical inactivity, consumption of salt and policy indicators related to food and nutrition do not address adolescence directly. A crucial outcome indicator that is not part of any global targets is the prevalence of low BMI or underweight among adolescent girls, an important determinant of reproductive and overall health.

Yet our ability to track nutrition goals that address adolescent outcomes, specifically anaemia and obesity, in global nutrition target monitoring frameworks is limited by the lack of global databases to enable comparability across countries. Where estimates are available, from the WHO, these suggest that iron deficiency anaemia is the leading cause of disease burden and disability among adolescents in 2015, with the most serious effects in Southeast Asian and African low and middle-income countries.[33]

The WHO is filling the data gaps in overweight and obesity. Its Global school-based student health survey weighs and measures adolescents aged 13–17 years in over 100 countries. It is producing country-comparable estimates of adolescent overweight and obesity based on this and other collected data. When released, this data will be a crucial tool in planning, designing and evaluating nutrition-related aspects of broader interventions that address adolescent health. However, these surveys are limited in some countries where a large proportion of adolescents are out of school. This is because they may not capture the most marginalised and disadvantaged adolescents, and hence need to be complemented with additional measures at population level.

SPOTLIGHT 2.4 DIET QUALITY DATA GAPS

Anna Herforth

Poor diet is one of the leading contributors to the global burden of disease,[34] linked to all forms of malnutrition as well as environmental sustainability. Astonishingly, there is no system across countries to track what people eat. No indicators of diet quality in the general population are collected across countries.

Current globally comparable indicators are crude proxies of diet, derived from national food balance sheets rather than individual dietary data. Recently, **proportion of calories from non-staple foods** has been reported in the Global Nutrition Report, alongside the longstanding **prevalence of undernourishment** indicator (the estimated proportion of the population without access to adequate calories). This newer indicator still leaves much unknown; for example, one country with high consumption of vegetables and beans, and another with high consumption of sugars and fats, could register an equal proportion of non-staple food calories.

Minimum dietary diversity for infants and young children is an indicator now collected in the DHS in 60 countries (and counting), which measures the proportion of children age 6 to 23 months who ate foods from four or more food groups (of seven) in the previous day, and corresponds to nutrient adequacy.[35] This indicator is helpful to understand care practices and diets among infants and young children. It should ideally be collected in all countries with the DHS, but even that would only fill the gap in data about diets among children younger than two.

Overall diet quality in the general population is critically needed, though not captured by any existing indicators. Diet quality information has several components including: adequacy of macro and micronutrients, food safety, dietary diversity and protection of health against diet-related NCDs. All are needed in all regions of the world, as bellwethers of malnutrition in all its forms. The recently-validated **minimum dietary diversity for women of reproductive age**[36] is an indicator of nutrient adequacy, measuring whether women are consuming adequately diverse diets. Indicators of **diet patterns that protect health** by reducing risk of diet-related NCDs need to be developed. We also need a mechanism to collect these indicators – one leaner than dietary intake surveys, which are costly and infrequently undertaken. Encouragingly, efforts are underway to add a diet quality module to the Gallup World Poll that would collect both the minimum dietary diversity for women of reproductive age and indicators of health-protective diet patterns.[37] If this initiative succeeds, it will provide regularly-collected, globally comparable diet quality information for the adult population in 160 countries.

Tracking indicators of diet quality across countries would be transformative for nutrition and health. As seen from past advances in nutrition, globally comparable, readily-interpretable indicators will raise the visibility of this top public health issue and enable informed policy debates and actions. Without clear information on what diets actually look like, it is difficult to move towards improving them.

SPOTLIGHT 2.5 LAUNCHING A NUTRITION DATA REVOLUTION: WHAT ARE WE WAITING FOR?

Ellen Piwoz, Rahul Rawat, Patrizia Fracassi and David Kim

In 2014, the first Global Nutrition Report declared "Nutrition needs a data revolution". The report's key messages laid out four actions: 1) identify data priorities and gaps through a consultative process in anticipation of the SDGs; 2) invest in nutrition survey capacity so that consistent and reliable national data would be available every 3 to 4 years; 3) ensure that high-income countries provide comparable data so that they can be included in progress tracking; and 4) invest in national and global, interoperable and accessible, nutrition databases to facilitate accountability. The report promised to analyse investments in relation to need to make this revolution a reality in its second edition in 2015.

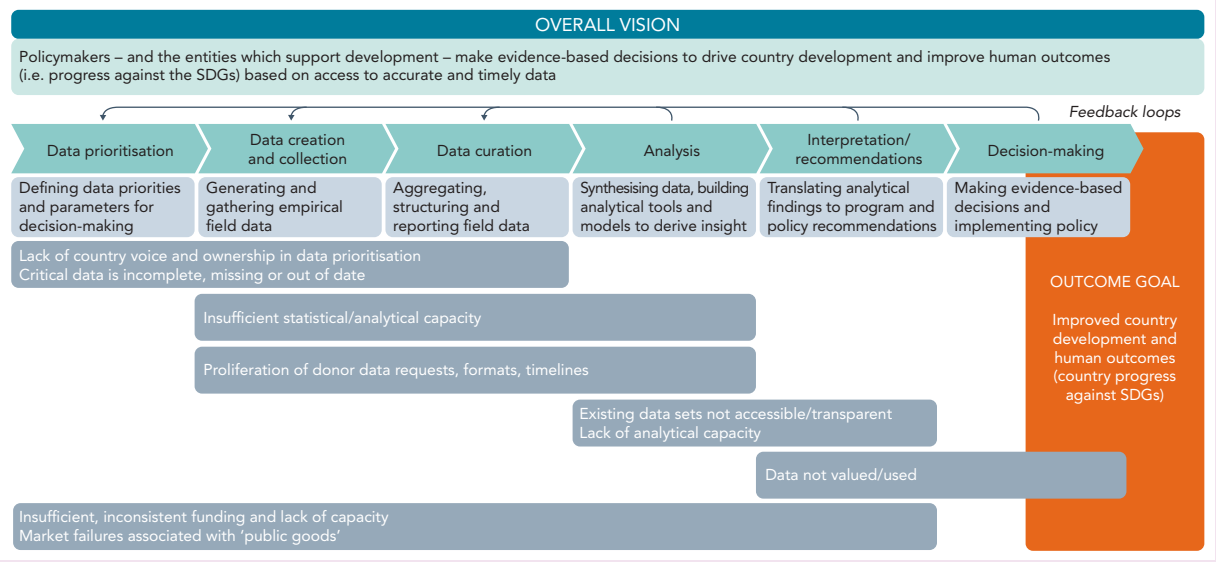
We now know that determining investments in relation to need is a promise more easily made than kept. This is true firstly because we have no reliable means for tracking spending on nutrition data. We have no template or global guidance on what nutrition data is essential to meet global nutrition targets, how to focus programmes on reaching those in need, or how to make the SDG 2 target 2.2 to 'end all forms of malnutrition' a reality. Without a clear vision as well as data prioritisation it will be impossible to meet the expectations laid out in 2014 (the Global Nutrition Report), 2015 (the SDGs), and again in 2016 (the UN Decade of Action on Nutrition 2016–2025).

Transforming how we think about data

Beyond collecting survey data every 3 to 4 years, as already suggested, we propose a holistic, horizontal view for a nutrition data revolution that stretches from priority setting to collection, analysis, interpretation and use of information by decision-makers. Put simply, we want to revolutionise efforts across the entire nutrition data value chain. Further, we propose positioning data – in and of itself – as a value product that is central to achieving the SDGs that must be costed and incorporated into national nutrition programmes and financing plans.

SDG 17 calls for immediate (by 2020) capacity-building support to increase the availability of high-quality, timely and reliable data disaggregated by income, age, race, gender, ethnicity, migratory status, disability, geographic location and other characteristics to enable robust progress tracking by 2030. A strengthened data and information system for nutrition has multiple purposes beyond progress tracking. Disaggregated data is needed to: define nutrition problems including magnitude, distribution, variability and high-risk populations; diagnose root causes; design interventions; inform course corrections and track progress; and hold those who are responsible to account. The proposed data value chain has five critical processes defined in Figure 2.11 and a final step, the use of data for decision-making.

FIGURE 2.11: Nutrition data value chain: vision, goal and common constraints



Source: Authors.

SPOTLIGHT 2.5 CONTINUED

A call for immediate action

The transformations needed to achieve the SDGs require new ways of thinking. When it comes to data, we cannot solely discuss aggregating information upward for annual reports. Rather we must explore fully exploiting and transforming data into information to make informed programme and policy decisions that will improve nutrition and other SDG outcomes. This will not be achieved without significant investments in data value chain capacities.

Some may argue that investing in data is too costly and that scarce resources should go towards delivering interventions and services. This argument can be countered with examples of how investing in data can 'pay for itself' in cost savings from more efficient and effective programmes. For example, a recent economic optimisation study from Cameroon used national survey data to suggest policy changes in the national vitamin A programme that could achieve the same effective coverage at 44% of the cost.[38]

Advancing this agenda rapidly will require: 1) in-country mechanisms for national priority setting and data coordination; 2) operational guidance for data prioritisation, harmonisation of indicators, and incorporation of nutrition into routine management information systems; 3) tools for capacity development at multiple levels; 4) costed data plans that are built into national development strategies, resourced and implemented; 5) dissemination of tacit knowledge and experience; 6) innovation across the value chain; and 7) fostering a culture of data use and sharing.

Some of these actions are more straightforward than others, and all present their unique challenges. But without these steps, we will not be able to transform the Decade of Action on Nutrition into a 'Decade of Transformative Impact', and the SDG target of ending malnutrition in all its forms will be much harder to achieve.

Conclusion: Getting on track

This chapter presents a stark picture of the global nutrition situation. When we look at the global level and across countries, the world is not on course to achieve the global nutrition targets. Given their significant overlap with the nutrition targets in the SDGs, it means we are not on track to achieve SDG targets 2.2 and 3.4.

Nutrition stakeholders and the wider development community: you need to play your part. We are all global citizens. Every one of us has a right to equitable nutrition and fair allocation of resources. But we need to share a *common humanity* to achieve this.

We need to support the least advantaged members of society to ensure they have the opportunities for healthy and fulfilling lives. While the lack of progress in nutrition outcomes may seem daunting, humanity has overcome greater hurdles and tribulations before. We must face these complex issues head on and move towards a universal approach to drive down these numbers over the next decade. To do so, we need to do things differently: connect nutrition across development (Chapter 3), invest in a more integrated way (Chapter 4) and make commitments deeper and more accountable (Chapter 5).

3 Connecting nutrition across the Sustainable Development Goals

Key findings

1. The Sustainable Development Goals (SDGs) can be brought together into five areas that are critical to achieving nutrition outcomes. These are:
   - *Sustainable food production* is important to ensure our land and waters are resilient and can support the diversity needed to provide nutritious and healthy diets.
   - *Systems infrastructure* is needed to deliver the clean water, sanitation, energy and food essential for nutrition to urban, peri-urban and rural settings.
   - *Health systems* are vital to provide treatment and preventative interventions for improved nutrition at scale.
   - *Equity and inclusion* are essential to ensure efforts to improve poverty, gender inequality, education and protections in the workplace deliver universal outcomes for nutrition.
   - *Peace and stability* are necessary to ensure conflict is not contributing towards famine and food insecurity.
2. These same areas are the means through which nutrition can contribute to development throughout the SDGs. For example: changing diets can make food production more sustainable; ensuring good nutrition early in life means better 'grey matter infrastructure' – the brain development essential to ensure economies can innovate and flourish; tackling nutrition challenges will reduce the burden on the health system; improving nutrition will help end poverty; and addressing food insecurity and famine can make an essential contribution to conflict and post-conflict work.
3. In all these areas, there are opportunities for 'double duty actions' that can address undernutrition, obesity and diet-related non-communicable diseases (NCDs). These will increase the effectiveness and efficiency of investment of time, energy and resources to improve nutrition. Likewise, potential 'triple duty actions' which tackle malnutrition and other development challenges could yield multiple benefits across the SDGs.
4. There is an immense opportunity to achieve the SDGs through greater interaction across silos. We must all transform our ways of working to enable the vision of the SDGs to become a reality. Improved nutrition cannot be a singular set of targets in a silo – rather it is an indispensable cog, without which the SDG machine cannot function smoothly.

The vision of the many architects of the SDGs was of an integrated, indivisible system for development. This chapter shows that improved nutrition is an essential component of this vision. Poor nutrition has many and varied causes which are intimately connected to work being done to accomplish other SDGs. Improved nutrition can be a catalyst for many of the SDG targets; conversely, we need action across the SDGs to achieve the ambitious nutrition targets we are currently off course to reach (Chapter 2).

The chapter starts by setting out an integrated vision for nutrition in the SDGs. It brings together SDGs 1 to 16 into five areas for development which nutrition can contribute to, and in turn, benefit from:

- sustainable food production
- strong systems of infrastructure
- health systems
- equity and inclusion
- peace and stability.

It then provides the evidence of the connections between nutrition and these five areas. The analysis is not comprehensive but teases out some of the main associations and interlinkages. It begins to paint a picture of what an integrated approach in the deepest sense – delivering multiple goals through shared action – looks like from a nutrition perspective (Chapter 1, Spotlight 1.2).

SDG 17 is a vital goal because it concerns strengthening the means of implementation across the goals through partnerships, capacity, data, accountability, financing and coherence. While not explicitly including SDG 17 in the five areas, we take the cross-cutting agenda set in SDG 17 as our starting point: the need for everyone to be involved, connecting across the goals. Of particular relevance is target 17.14: 'enhance policy coherence for sustainable development'.

An integrated vision for nutrition in the SDGs

Different parts of government, non-governmental organisations (NGOs), researchers, development professionals and the private sector – including the nutrition community – are currently, for the most part, focused on achieving their 'own' SDGs and targets (Figure 3.1). This is understandable. However, if we are to achieve the SDGs, and do better for nutrition, we need to take action that reflects the interactions across the goals. This is why SDG 17 calls for 'policy coherence for sustainable development' as a fundamental means of implementation (Chapter 1, Spotlight 1.2).

FIGURE 3.1: The 17 SDGs

Source: UN. Sustainable Development Goals, 2015.

Clearly we cannot talk sensibly about ending hunger, or achieving food security or well-being, for example, as if they were separate from nutrition. Nor is nutrition indivisible from health (SDG 3) or most of the other SDGs (See *Global Nutrition Report 2016*, Figure 1.1, page 3).

This means it is essential that nutrition is seen as indivisible from the wider process of achieving sustainable development. And crucially that actions and investments in nutrition have the potential to have multiple – or at least double or triple duty – impacts in a universal and integrated way (see also Chapter 1). Improved nutrition cannot be a singular set of targets in a silo – rather it is an indispensable cog, without which the SDG machine cannot function smoothly.

To act in an integrated way, we all need to know how our work relates to and can achieve progress across the other SDGs. Existing analysis already shows the huge potential for making connections between SDGs[1] – but there is also the potential for incoherence. Some interactions between targets are 'constraining' or 'counteracting', meaning that they inhibit the achievement of another.[2] Achieving one SDG may not always lead to positive outcomes of other SDGs. But they are connected and these connections need to be transparent so they can be leveraged and mitigated. Mapping the connections brings these synergies, and the trade-offs, out into the open.

Yet correlations and causes between nutrition and other development issues are complex; they run in multiple directions. Trying to map relationships between all SDGs at once is difficult – the results are tangled and hard to read. It is not surprising that countries have struggled to develop integrated SDG plans.[3] Here we identify the areas of development – in low, middle *and* high-income countries – across the SDGs in which nutrition can bring real benefits, and where nutrition will benefit from greater action (Figure 3.2).

The first area is sustainable food production, which brings together four SDGs: SDG 2 – which contains a range of targets on sustainable agriculture alongside hunger and malnutrition, SDG 13 on climate action, SDG 14 on life below water and SDG 15 on life on land. These are in turn intimately bound up with nutrition because what we eat and how and where it is produced influence climate change, biodiversity and our waters. Changing what we eat, and where and how we get our food, is needed to achieve SDGs 2, 13, 14 and 15. In turn, improving the sustainability of food production is necessary to improve nutrition: climate change is threatening our ability to produce nutritious crops, as are threats to our fisheries. Diverse crop production landscapes are essential for producing nutritious foods. Addressing these SDGs will thus be fundamental to achieving nutrition targets.

Six SDGs are concerned with well-functioning systems of infrastructure. These are SDG 6 on clean water and sanitation, SDG 7 on affordable and clean energy, SDG 8 on decent work and economic growth, SDG 9 on industry, innovation and infrastructure, SDG 11 on sustainable cities and communities and SDG 12 on responsible consumption and production. Improved nutrition supports this infrastructure by ensuring there is enough 'grey-matter infrastructure': healthy people with the knowledge, ability and energy to drive economic development and build the future (SDG 8). The SDGs also show how critical it is to invest in systems infrastructure, from roads to sanitation, from electricity to buildings, as well as infrastructure needed for governance, law, markets, and financing, to ensure that everyone can have safe, nutritious and healthy diets, clean water, sanitation and energy. Food systems are an important part of this picture.

One SDG is dedicated to a development priority indivisible from nutrition: SDG 3 on ensuring healthy lives and promoting well-being for all people at all ages. Tackling nutrition challenges will reduce the burden on the health system. Improved nutrition during the first 1,000 days of life means less wasting, stunting and obesity, which means less sickness and lower death rates. It also lowers the risk of diet-related NCDs such as cardiovascular disease and diabetes later in life. And of course, a well-functioning health system is vital not just to treat, but to deliver preventative interventions at scale. The SDGs show just how much more effort and focus is needed for health systems to include nutrition and diet-related NCD programmes and interventions in universal health coverage.

Another set of SDGs is fundamentally concerned with equity and inclusion, which itself has a strong influence on whether everyone will benefit from sustainable food production, systems infrastructure and health services. These issues are about poverty (SDG 1), quality education (SDG 4), gender equality (SDG 5), rights at work (SDG 8) and are part of the cross-cutting SDG on inequality (SDG 10). Though it is difficult to untangle the associations, all these factors are connected to nutrition. Lack of attention to equity in the distribution of wealth, education and gender will make it difficult to end malnutrition in all its forms universally.

Nutrition is also part of one of the overarching calls of the SDGs: peace and stability (SDG 16). Investing in food security – the equitable distribution of natural resources important for food – and nutrition resilience is one way of preventing famine. Linking immediate humanitarian relief interventions with longer-term development approaches is important for this resiliency. The SDGs highlight that conflict resolution and prevention must never be forgotten – and that nutrition must be included in disaster risk reduction, conflict mitigation and post-conflict rebuilding as part of SDG 16. Malnutrition will never end without peace and stability.

In sum, connecting nutrition across the SDGs means that people will benefit in multiple ways. Based on the evidence given in the rest of this chapter, Box 3.1 exemplifies what improved nutrition can do across development and what in turn others can do for nutrition. Box 3.2 shows that connecting nutrition across the SDGs means taking actions to reduce the risk of undernutrition while reducing the risk of the unhealthy diets associated with obesity and diet-related NCDs – the so-called 'double duty actions.' Box 3.3 lists five potentially powerful *double* duty actions across the SDGs. The evidence shows too that there is the potential to achieve multiple goals through shared action. Box 3.4 sets out some examples of potentially powerful *triple* duty actions – ones that add in a third component such as environmental protection or economic development.

BOX 3.1 WHAT IMPROVED NUTRITION CAN DO FOR OTHER SECTORS AND WHAT YOU CAN DO FOR NUTRITION

If you work in agriculture, better diets can increase your markets for safe and nutritious foods while reducing the pressure on you to produce food using unsustainable methods. But we also need your help. We need you – whether a small producer, a medium-sized horticultural operation, or a large agribusiness – to increase or maintain diversity in production landscapes.

If you are working in fish production, you stand to benefit from larger markets if people eat more fish. This will help nutrition because fish is one of the best sources of nutrients. But to ensure nutrition for future generations, fisheries and aquaculture must be environmentally sustainable. And fish sources must remain accessible for the poorest people to ensure they get access to key nutrients that marine life provides.

If you work on climate change or protecting biodiversity, you will benefit if people eat diverse, nutritious diets that have low environmental footprints and that decrease the strain on natural resources and ecosystems essential for food production. In turn, we need your help in bringing attention to nutrition in climate change discussions, especially in light of the Paris Agreement on climate change.

If you work in a ministry of finance, improving nutrition of children and women will help your economy grow. That means you need to invest in systems infrastructure, health services and education that reaches everyone, including the most vulnerable and geographically isolated.

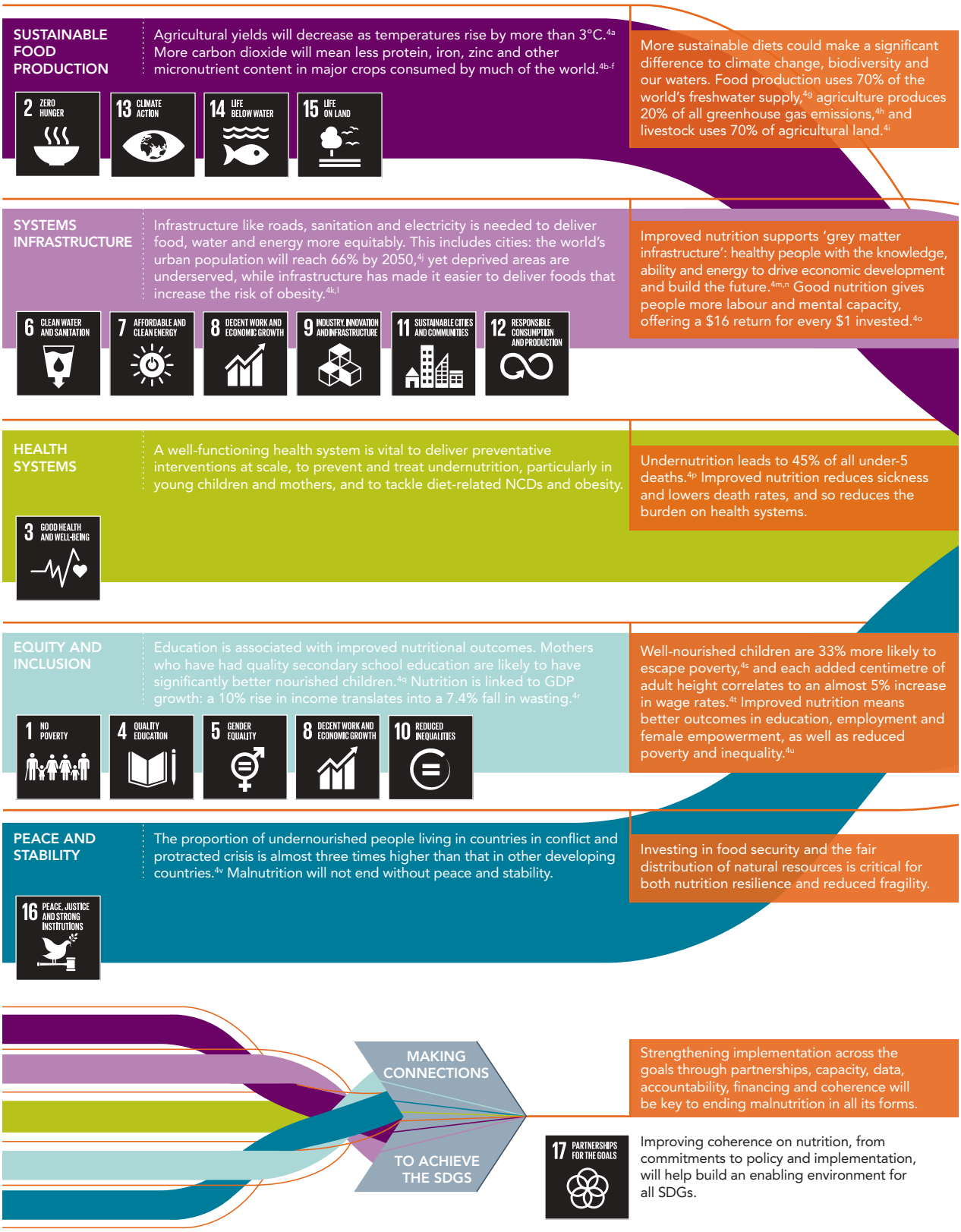
If you work for a company building roads or other transport infrastructure, energy supplies, water pipes, cities or investment infrastructure, you too will benefit from a more productive workforce. In turn, we need you do things differently: to ensure that infrastructure is put into place to enable access to clean water, sanitation, energy and safe, nutritious, healthy diets – and for this infrastructure to serve everyone, not just the more advantaged parts of society.

If you work in health systems, better nutrition means you will have less burden on your health services. In turn, we need you to do a better job of delivering essential actions for undernutrition through the health system. The health system also needs to provide services that can help prevent and manage diet-related NCDs like cardiovascular disease and diabetes, and to ensure it serves food to its patients which promotes good health.

If you work in education, improved nutrition brings enormous improvements to the ability to do well in school. In turn, we need your help to ensure girls in low and middle-income countries stay and progress in school rather than dropping out. And no less to provide the education and food needed to promote healthy diets.

If you work on conflict prevention and peace building, investing in food security and nutrition resilience will help your cause. In turn, we need your help to ensure that nutrition and health of citizens experiencing conflict does not deteriorate into famines and high mortality due to acute malnutrition.

FIGURE 3.2: How nutrition links to the SDGs



Source: Various[4]

BOX 3.2 SEVEN WAYS THE NUTRITION COMMUNITY CAN FURTHER DEVELOPMENT ACROSS THE SDGS

1. Encourage people in all countries, particularly those living in high-income countries, to consume diets that are produced within what the environment can bear, and advocate for policies and practices that help to mitigate climate change.
2. Engage with communities concerned with life in the water to ensure fisheries are sustained for both livelihoods and nutrition.
3. Collaborate with people primarily concerned with improving water, sanitation and hygiene to advocate for infrastructure for shared benefits.
4. Join urban food policy networks focused on urban agriculture, access to food and climate change to help advance their goals, while also building in benefits for nutrition.
5. Support the health service community in providing malnutrition prevention and treatment through primary healthcare and other health service delivery platforms.
6. Persuade nutrition leaders in governments to include the protection of labour rights, education and gender equality in nutrition plans.
7. Join calls to invest in early warning systems and early action to avoid future conflicts, create resilience and mitigate the risk of future conflict.

Source: Authors, based on chapter text.

BOX 3.3 FIVE IDEAS FOR DOUBLE DUTY ACTIONS TO ADVANCE PROGRESS ACROSS DIFFERENT FORMS OF MALNUTRITION

1. **Promotion and protection of breastfeeding in the workplace.** Breastfeeding is the best source of nutrition for babies and produces benefits for both sides of the double burden of malnutrition. Children who are breastfed experience fewer infections; women who breastfeed reduce their risk of breast cancer. A renewed focus on maternity protection in the workplace could be an area of joint advocacy between the undernutrition and obesity/NCD communities.
2. **City planning for safe, nutritious and healthy diets.** Building urban infrastructure necessary to ensure access to affordable, safe and nutritious foods in underserved areas, such as in slums, could reduce health risks associated with inadequate consumption of nutritious foods while also discouraging the provision of foods which raise the risk of obesity. People in these areas must be consulted to determine what type of infrastructure would most effectively meet their needs.
3. **Clean water made available in communities and settings where people gather.** Clean water helps prevent diarrhoea and environmental enteropathy and, therefore, reduces the risk of undernutrition. It also ensures people have a viable alternative to sugary drinks, which are associated with weight gain. Sugary drinks may also be presented as a more attractive option than water. A 'sugary drinks tax' could be treated as a double duty action by raising funds for making clean drinking water available and appealing everywhere.
4. **Universal healthcare packages with undernutrition and diet-related NCD prevention.** Vertical programmes delivered through health systems often focus exclusively on undernutrition. Yet abundant opportunity exists to integrate programmes for obesity and diet-related NCD prevention into universal health coverage packages, such as nutritional counselling, treatment and monitoring. A first step is to pilot such shared approaches to overcome the barrier of lack of knowledge of best practice.
5. **Costed, multisectoral nutrition plans which contain double duty actions.** Such plans should also be costed and show clearly how both domestic financing and international donors could contribute to delivering double duty. Ensuring that financing of both sides of the double burden is effectively tracked would help assist this process (see also Chapter 4).

Source: Authors, based on chapter text.

BOX 3.4 FIVE IDEAS FOR TRIPLE DUTY ACTIONS TO ADVANCE PROGRESS ACROSS THE SDGS

1. **Diversification of food production landscapes.** This can provide multiple benefits by ensuring the basis of a nutritious food supply essential to address undernutrition and prevent diet-related NCDs; enabling the selection of micronutrient-rich crops (including indigenous and orphan crops) with ecosystem benefits; and, if the focus is on women in food production, empowering women.
2. **Scaled up access to efficient cooking stoves.** This would improve households' nutritional health, improve respiratory health, save time, preserve forests and associated ecosystems, and reduce greenhouse gas emissions.
3. **School meal programmes.** Programmes can be more effectively designed to reduce undernutrition, ensure children are not unduly exposed to foods that increase risk of obesity, provide income to farmers, and encourage children to stay in school and/or learn better when at school. This would not only help improve nutrition, but support livelihoods and education.
4. **Urban food policies.** Urban food policies and strategies are currently being developed across low, middle and high-income countries that aim to reduce climate change, food waste, food insecurity and poor nutrition. They are single policies with the potential to achieve multiple goals.
5. **Food aid platforms.** Working alongside conflict response specialists, nutritionists could help to design food assistance programmes that serve as platforms to promote quality, nutritious diets while also rebuilding resilience via local institutions and support networks, building farmers' ability to adapt and reorganise, and supporting marginalised and vulnerable groups.

The evidence

Sustainable food production

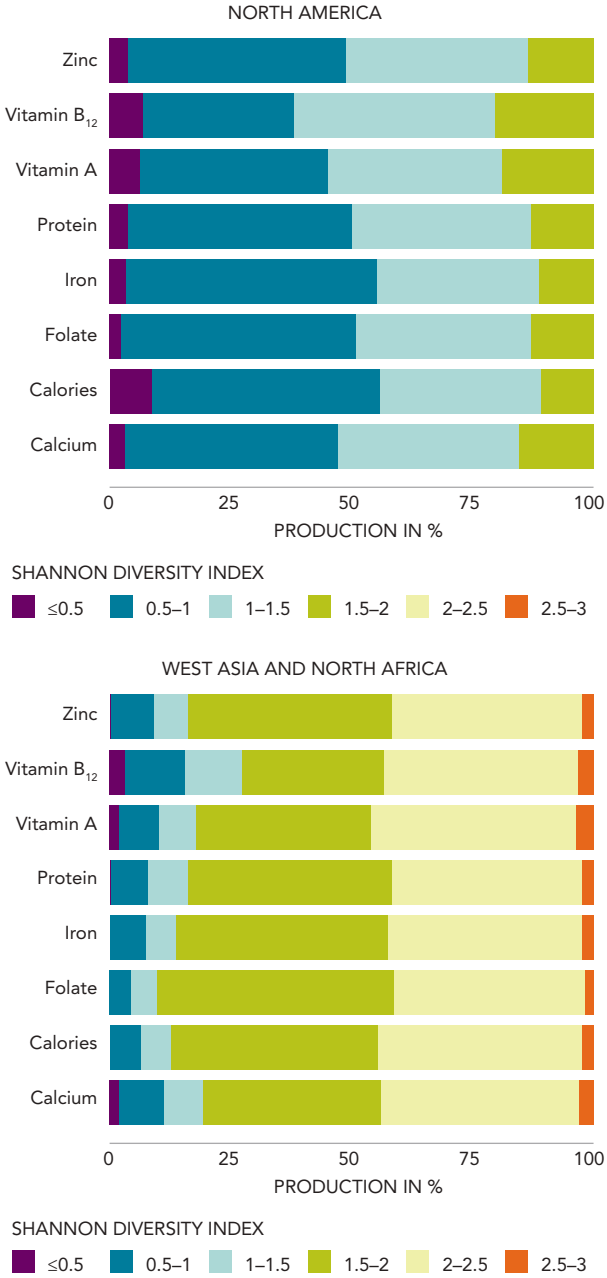
The evidence is clear that we need to eat differently if we are to address SDG 13 on climate change, SDG 14 on life below water, SDG 15 on life on land and the targets on sustainable agriculture within SDG 2 on zero hunger. Food production already puts tremendous strain on natural resources, using 70% of the world's freshwater supply,[5] and 38% of the world's land.[6] Agriculture also produces 20% of all greenhouse gas emissions.[7] Livestock is especially land intensive, using 70% of agricultural land.[8] Forests, grasslands and wetlands are being converted to farmland to feed a growing population, along with the animals that we consume.[9] Finding less resource-intensive ways to produce safe, nutritious, healthy diets is essential to adapt to the existing impacts of climate change, and reduce the amount of greenhouse gas emissions. The evidence suggests that a particularly challenging area is meat. Meat is a nutritious food source that provides key nutrients;[10] yet high intake is culpable in producing relatively high levels of greenhouse gases.[11] Red and processed meats are associated with increased risk of one of the world's leading cancers, colorectal cancer.[12]

At the same time, improved nutrition requires systems of food production in which safe, nutritious, healthy diets – wholegrains, fruits and vegetables, legumes, nuts, fish, moderate amounts of dairy and small amounts of meat – are produced, sustainably. This means paying attention to climate change (SDG 13), fisheries (SDG 14) diversity of life on land (SDG 15) as well as sustainable agriculture (SDG 2). Climate change models predict that agricultural yields will decrease in most areas where crops are grown, as temperatures increase by more than 3°C, particularly in the global South.[13] Climate change also affects the nutritional quality of crops, lowering the nutritional content in some foods due to carbon dioxide fertilisation effects.[14] It is estimated that increased carbon dioxide will result in decreased protein, iron, zinc and other micronutrients in major crops consumed by much of the world.[15]

Climate change also affects fisheries (SDG 14) through changes in ocean temperatures, salinity, oxygen and acidification levels, and freshwater temperatures and water level.[16] Fish are estimated to provide 17% of the global population's intake of protein and provide calcium, iron, zinc, iodine, vitamins A and D and omega-3 fatty acids.[17] Fatty fish sourced primarily from fisheries are the primary dietary source of long chain polyunsaturated omega-3 fatty acids. These have been associated with positive outcomes when consumed in pregnancy including better child development and lower risk of preeclampsia/early preterm delivery, and with better cardiovascular health when consumed in adulthood.[18] Yet there are trade-offs: as humans eat more fish from fisheries, fish stocks will be depleted if fisheries are not sustainably managed, resulting in detrimental environmental outcomes with repercussions for the diets of future generations.[19]

Protecting diversity on land (SDG 15) is critical for nutrition. While historically agriculture has focused on growing enough staple crops to produce sufficient food through highly-specialised farms and landscapes, more diverse landscapes yield both more food and a lot more nutrients (Figure 3.3).[20] Recent evidence shows 53–81% of key micronutrients are produced by small and medium farms, which make up 84% of all farms and 33% of the land areas globally and tend to be more diverse than larger farms.[21] This partly reflects geography – most farms in the Americas are large, most in Africa small and many in Asia in the middle. But this shows it is especially critical that food policy in regions where investment is being made to increase production focuses strongly on maintaining diversity. It is also vital that policy works to ensure diverse production actually translates into better diets. For while there is some evidence of a positive relationship between the number of crop species grown on farms and the food group diversity of households,[22] diverse production systems do not necessarily translate into diverse diets if producers sell this diversity, or if the infrastructure is not there to get it to markets accessible to the people who need it most.[23] Moreover, nutritious foods produced by agriculture may be diverted into less nutritious, less healthy foods such as wholegrains into refined grains, or maize into soda.[24] This is why it is necessary to consider the whole *food system* when assessing the associations between sustainable food production and what we eat, as described in the following section (and Figure 3.4).

FIGURE 3.3: Nutrients produced in two regions by diversity category



Source: *Herrero M et al*[25]

Notes: *The Shannon diversity index represents diversity: how many types of foods are produced in a geographic pixel and how evenly these are distributed. The higher the Shannon index, the higher the diversity.*

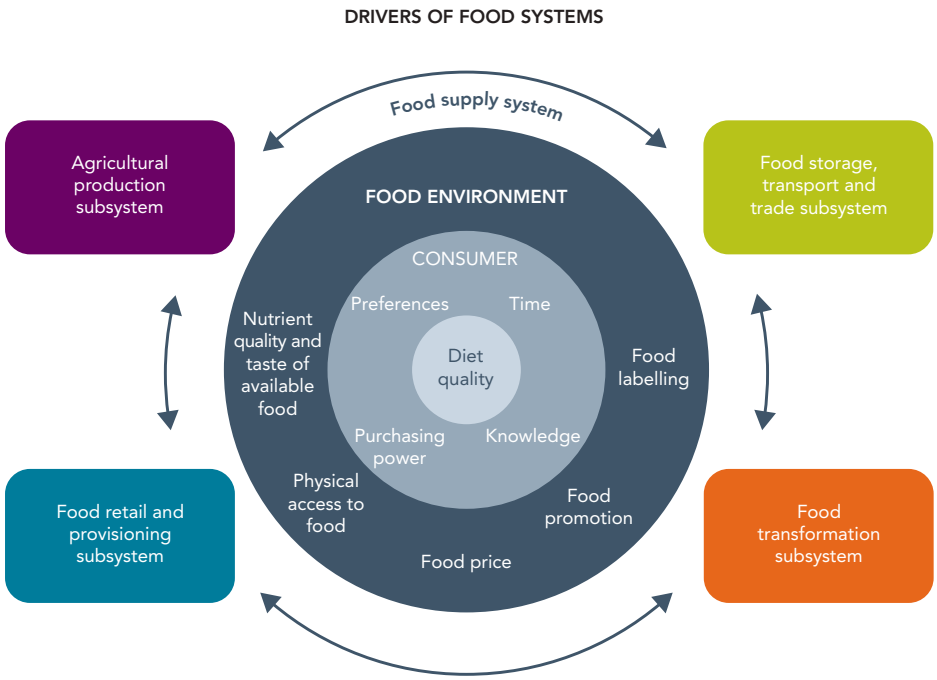
Systems infrastructure

SDG 9 is concerned with building resilient infrastructure to support economic development and human well-being, and ensuring that access to this infrastructure is equitable. When we think of infrastructure, nutrition does not typically come to mind first. But improved nutrition advances one of the most essential forms of infrastructure: 'grey matter infrastructure'. The World Bank and the African Development Bank have called for investment in preventing childhood malnutrition on the basis that it impedes brain development. Evidence is clear that nutrition not only saves children's lives, but provides them with the mental capacity needed to support human development throughout life.[26]

The mental capacity enabled by improved nutrition is critical to better futures and faster and more inclusive economic growth – core to achieving SDG 8. Economies and societies depend on the ingenuity of their populations to progress, as much as on their physical strength. In the 21st century, a knowledge-based economy plays a major part in human development. The returns on investment in nutrition are impressive, at US$16 for every US$1 invested.[27] This is increasingly being acknowledged: India's Ministry of Finance, in its Economic Survey 2015–16, stated "Imagine the government were an investor trying to maximise India's long-run economic growth. Given fiscal and capacity constraints, where would it invest?... relatively low-cost maternal and early-life health and nutrition programmes offer very high returns on investment."[28] Indeed, the 'Cost of Hunger in Africa' studies in four African countries estimate that African economies lose values equivalent to between 1.9 and 16.5% of GDP annually to undernutrition due to increased mortality, absenteeism, chronic illnesses and associated costs, and lost productivity.[29] The costs of overweight and obesity are no less striking: in Germany, for example, the lifetime cost of overweight and obesity for the current population is €145 billion.[30] In the US, households with one obese person face, on average, annual healthcare costs equivalent to 8% of their annual income.[31] In China, people diagnosed with diabetes face an average annual 16.3% loss in income.[32]

With the increased brain power and productivity that improved nutrition brings, countries have greater capacity to develop economically. To get there will involve building the infrastructure needed for development, such as governance, law, markets and financing. It will also involve investing in the hard systems of infrastructure – roads, refrigerators, pipes, toilets, telephones, internet technology, and so on. Evidence indicates this is necessary to deliver safe, diverse and nutritious diets, clean water and hygiene to people – all of which are essential to improving nutrition. This is very clear in the case of food systems (Figure 3.4). After production, infrastructure is needed for food to move through complex systems of distribution, processing, trade, retailing and marketing to the point where people access it (Figure 3.4).[33]

FIGURE 3.4: Conceptual framework for the links between diet quality and food systems



Source: Global Panel on Agriculture and Food Systems for Nutrition

This has important implications for safe, nutritious and healthy diets – and who can access them.

For example, improved post-harvest storage and transport is important to prevent contamination of food, such as through microbiological pathogens, like rotavirus, *Salmonella* spp and *Campylobacter* spp or fungal toxins such as aflatoxin. Food safety is an important but often under-recognised aspect of nutrition. Each year an estimated 600 million people in the world – almost 1 in 10 – fall ill after eating unsafe food and 420,000 die.[34] Foodborne pathogens are a major cause of diarrhoea among young children, which in turn contributes to underweight and high levels of mortality.[35] Aflatoxins found in maize and groundnuts in tropical and subtropical developing countries are associated with stunting in children and responsible for an estimated 90,000 deaths from liver cancer each year.[36] Food safety is also strongly linked to clean water and sanitation, as discussed later in this section.

There are also synergies across the food system between interventions to reduce food loss and waste and those promoting nutrition.[37] Estimates suggest that one-third of all food produced (1.3 billion tons) is lost or wasted every year during production, storage, transportation, processing and consumption.[38] The lack of infrastructure in many developing countries and poor harvesting/growing techniques are likely to remain major factors contributing to food loss with ranges between 10% and 40% of total food production.[39] This is relevant to nutrition because many of the most nutritious crops essential for dietary adequacy and diversity (such as groundnuts, fruits and vegetables) suffer the highest volumes of post-harvest losses[40] with one-third of all fruits and vegetables produced worldwide lost before they reach consumers.[41] Well-functioning infrastructure is needed here – and will also address one of the ambitious targets of SDG 12 on responsible production and consumption: to halve per capita global food waste, including through reducing food losses along supply chains.

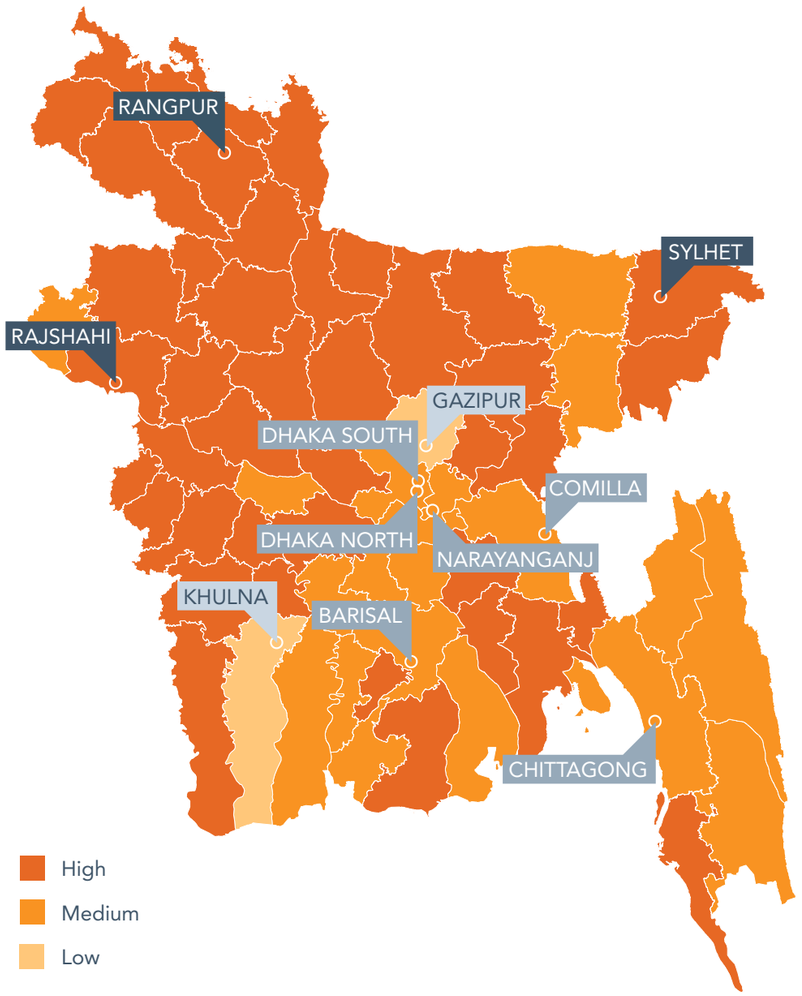
Sustainable production and consumption also involves managing energy supply and use, and SDG 7 calls for affordable and clean energy that is accessible to everyone. The food sector accounts for 30% of the world's total energy consumption.[42] Four-fifths of this energy is consumed post farm, and moving and transforming food 'from farm to fork' makes up the highest proportion globally.[43] In lower income countries, cooking in the home consumes the greatest amount of energy. Scaling up the infrastructure required to cook – namely efficient cooking stoves – would improve households' health, save time, preserve forests and associated ecosystems, and reduce emissions.[44]

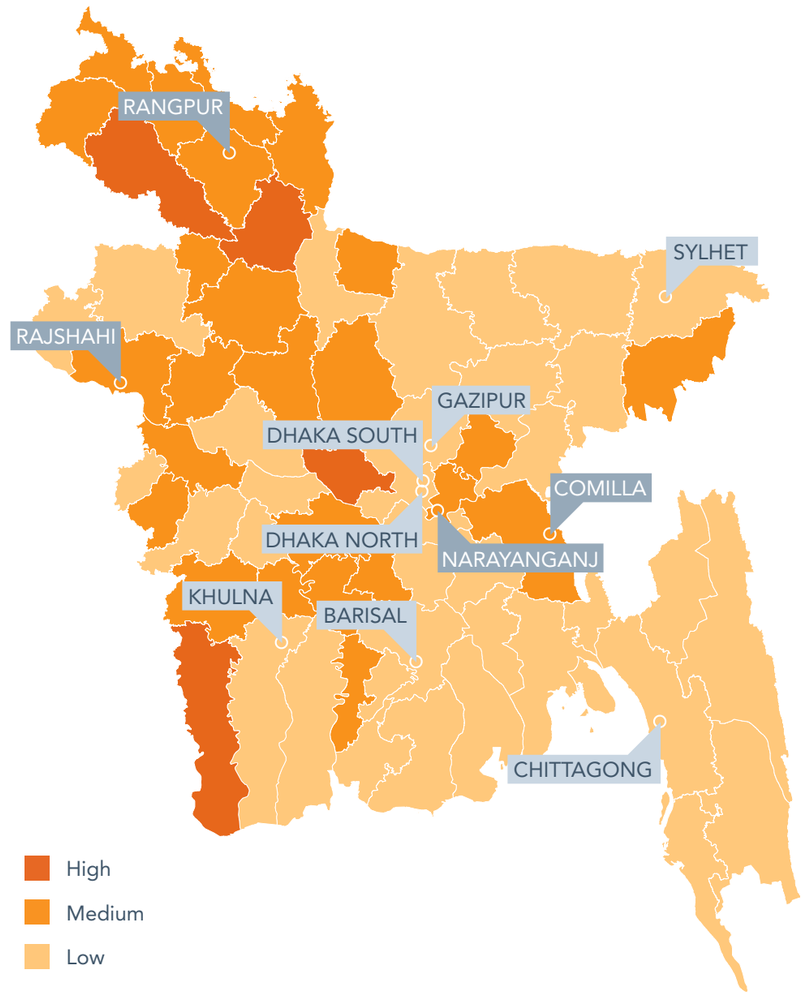
A key question is, who has access to this infrastructure? For example, there is typically a greater diversity of food in cities due to better distribution, energy and retailing infrastructure. But this is often not the case in slums or deprived neighbourhoods where infrastructure is not developed or where it is used to deliver unhealthy diets.[45] Poorer city dwellers are increasingly exposed to high-calorie, nutrient-poor foods.[46] This highlights the potentially counteracting nature of the development of infrastructure since it has enabled delivery of foods that increase the risk of obesity in cities, made more appealing through advertising and other forms of marketing.[47] Addressing these types of challenges in urban areas is a core component of SDG 11 on sustainable cities and communities – and will become more relevant as the world's urban population grows towards 66% by 2050.[48] Ongoing developments in cities to implement food policies to address lack of access to adequate food, obesity, food waste, livelihoods and climate change, have a potentially critical role in addressing these food system challenges.[49]

Infrastructure to deliver clean water, sanitation and hygiene (SDG 6) – its quality, reliability and continuity – is likewise critical for nutrition. It has been estimated that 50% of undernutrition is associated with infections caused by unsafe water, poor sanitation and unhygienic practices, including not washing hands with soap.[50] Repeated diarrhoea or intestinal infections can cause both acute and chronic undernutrition.[51] For example, 54% of international variation in children's height can be linked to open defecation. Where clean water is only accessible at a distance from people's homes, their nutritional requirements are increased by the energy expended in fetching it – while their time and capacity to work for income are reduced. Yet where water and sanitation infrastructure is developed, it tends to primarily benefit wealthier populations. Many countries have significant income and spatial inequities in the provision of clean water and sanitation services. For example, while some districts in Bangladesh deliver water and sanitation to a standard higher than the national average to both low-income and high-income groups, most districts deliver this higher standard only to higher-income populations (Figure 3.5).[52]

The good news is that examples of greater integration between water and sanitation and nutrition are emerging. Spotlight 3.1 shows an example from Cambodia, where the government has prioritised water, sanitation and hygiene in a programme to reduce stunting, as part of its 2014–2018 National Strategy for Food Security and Nutrition.[53] Significant results have been achieved by making concerted efforts to ensure collaboration with NGOs and UN agencies and across sectors including agriculture, health and rural development, nutrition and water, sanitation and hygiene.[54]

FIGURE 3.5: District coverage of safely managed water supply and improved sanitation to top 60% and bottom 40% of households, Bangladesh, 2012





Source: *Reproduced from World Bank. 2017. Precarious Progress: A Diagnostic on Water, Sanitation, Hygiene, and Poverty in Bangladesh. WASH Poverty Diagnostic. Washington, DC, World Bank.*[55]

Notes: *Safely managed water is defined here as improved water technology, on the premises, and free from E. coli and arsenic. High is defined as above average coverage of both safely managed water supply and improved sanitation. Medium is defined as above average coverage of either safely managed water supply or improved sanitation. Low is defined as below average coverage of both safely managed water supply and improved sanitation.*

SPOTLIGHT 3.1 INTEGRATED POLICY AND ACTION ON NUTRITION AND WATER, SANITATION AND HYGIENE IN CAMBODIA

Dan Jones and Megan Wilson-Jones

Despite steady economic growth and poverty reduction, malnutrition remains a public health threat in Cambodia. One in four children under five is underweight, one in ten is wasted and one in three is stunted, irreversibly damaging their long-term cognitive and physical development,[56] and contributing to low wages and lost productivity as adults.[57]

Child malnutrition including stunting is affected by an array of complex factors calling for a multisectoral response.[58] In rural communities in Cambodia, fewer than half of households use an improved latrine,[59] and around half have access to an improved drinking water source.[60] Despite initial progress, studies show a decline in exclusive breastfeeding rates among infants less than 6 months of age in recent years,[61] while bottle use has increased, especially among the urban poor, a population particularly at risk for use of contaminated water.[62] Recent data also suggests that only 30% of children aged 6–23 months receive a minimum acceptable diet.[63]

The Royal Government of Cambodia is taking action. The government has prioritised improving water, sanitation and hygiene practices and services – known as WASH – as a means to advance the government's multisectoral commitment to reducing stunting. Led by Cambodia's Council of Agricultural and Rural Development, the National Strategy for Food Security and Nutrition (2014–2018) reflects clear prioritisation of WASH as part of a comprehensive approach uniquely combining nutrition-specific with nutrition-sensitive interventions at all levels.[64] The strategy advocates for WASH to be integrated in all child and maternal nutrition programmes, particularly community-based nutrition, behaviour change campaigns and school curricula. It also outlines different institutional mechanisms to coordinate food security and nutrition in Cambodia, including WASH actors, and commits to strengthening the capacity of national and subnational government to plan, implement, monitor and evaluate multisectoral programmes.

Building on this strong policy basis, the Council of Agricultural and Rural Development unified the Ministries of Rural Development and Health along with core donors and development partners to establish a WASH and Nutrition Sub-Working Group that drives integrated actions forward.

The donors and development partners are WaterAid, Save the Children, the Global Sanitation Fund, Plan International, United Nations Children's Fund (UNICEF), World Food Programme, World Health Organization (WHO), Helen Keller International and the World Bank. Established in December 2015, the group aims to achieve greater impact by developing and sharing experiences of integration of WASH and nutrition, and establishing greater synergy between the sectors.

Integration in Cambodia is not new but was never easy; many previous efforts stalled. To succeed, in 2016 the group invested jointly in developing a theory of change for integrated nutrition programming, and commissioned a study to build an in-depth understanding of its barriers and potential solutions. Based on the findings and recommendations of the study by the Burnet Institute,[65] the government-led group identified three priorities for action:

1) Appoint focal people who can accumulate knowledge about WASH and nutrition.
2) Develop a cross-sectoral strategy that outlines how existing WASH and nutrition policies contribute to integrated efforts to improve nutrition outcomes.
3) Advocate to the Ministry of Economy and Finance for increased national budget allocations to nutrition and WASH, and advocate to donors for increased merged funding opportunities.

Endorsed by government and driven by the evidence, in 2017 all levels of government and development partners have embraced the integrated, multisectoral strategy to reducing malnutrition. The national WASH and Nutrition Sub-Working Group continues to coordinate national efforts. Subnational health, rural development and agriculture representatives are discussing integration for the first time. Government and development partners are bringing it to the Cambodian villages, districts and provinces they support. More donor agencies are building on promises and early successes of water, sanitation and hygiene-nutrition policy and action in Cambodia.

Health systems

Nutrition and health are indivisible: malnutrition is a form of poor health and all diseases increase nutritional needs.[66] Adequate nutrition during the first 1,000 days of life means less wasting and stunting, as well as less illness and death.[67] It also lowers the risk of NCDs such as cardiovascular disease and diabetes later in life.[68] All these conditions place a burden on the demand for health services. SDG 3 is dedicated to health and contains more targets and indicators than any other goal intimately associated with nutrition, including targets 3.2 on child mortality and 3.4 on NCD mortality (Figure 3.2).

In turn, improving health services is necessary for improving nutrition. The health system has a key role in promoting infant and young child feeding, supplementation, therapeutic feeding and nutrition counselling to manage overweight and underweight, and screening for diet-related NCD in patients. Several essential interventions for undernutrition, so-called 'essential nutrition actions' are delivered through primary healthcare. These include breastfeeding and nutritional supplements for women of reproductive age (such as folic acid, vitamin A and other micronutrient supplements).[69] Severe acute malnutrition is often treated in the health system too, in both formal tertiary care settings and community health outreach through community-based management of acute malnutrition. Yet the evidence is clear that these essential actions are not currently being delivered through the healthcare system. Health services are typically hampered by human resource gaps at local levels, especially in poor, rural areas. Table 3.1 shows to what extent four essential nutrition actions are reaching the people who need them (termed 'coverage'). For example, it shows that only 5% of children aged 0–59 months are receiving zinc treatment (for full list see Appendix 2).

TABLE 3.1: Coverage of essential nutrition actions

Coverage/practice indicator	Associated intervention recommended by Bhutta et al, 2013 (target population)	Number of countries with data	Minimum %	Maximum %	Mean %	Median % for countries with data
Children 0–59 months with diarrhoea who received zinc treatment	Zinc treatment for diarrhoea (children aged 0–59 months)*	46	0	28	5	2
Children 6–59 months who received two doses of vitamin A supplements in 2014	Vitamin A supplementation (children aged 0–59 months)*	57	0	99	65	79
Household consumption of adequately iodised salt	Universal salt iodisation*	84	0	100	57	62
Women with a birth in last five years who received iron and folic acid in the most recent pregnancy and took it for 90+ days	Multiple micronutrient supplementation (pregnant women)	59	0.4	82	31	30

Source: Kothari M, 2016, Demographic and Health Survey intervention coverage data, 2016 and UNICEF global databases, 2016.[70] For India, new data from Rapid Survey on Children 2013–2014 is used where applicable.

*Notes: The four essential nutrition actions shown are those with intervention coverage indicators. For full list see Appendix 2. *Interventions recommended by WHO's e-Library of Evidence for Nutrition Actions.[71] Multiple micronutrient supplementation recommended by Bhutta et al.[72] Data is from Demographic and Health Surveys, Multiple Indicator Cluster Surveys and national surveys conducted between 2005 and 2015. Surveys older than 2005 have been excluded from this table pending WHO ratification of this recommendation.*

To date, health services have also done an inadequate job of integrated NCD prevention.[73] For example, even in countries that recognise their burdens of diet-related NCDs, few actually include strategies such as promotion of healthy diets, obesity prevention and diabetes self-management education in universal healthcare packages.[74] Interventions for diet-related NCD prevention and treatment, such as managing hypertension and diabetes, are often inadequately delivered through health systems too. In 2015, half of all countries had not implemented NCD management guidelines that address four main NCDs (cardiovascular disease, diabetes, cancer and chronic obstructive pulmonary disease), and only 38 (20%) had drug therapy and counselling for glycaemic control, stroke and heart attack for high-risk people available in primary care facilities.[75] A World Bank survey of 24 countries, most of which have burdens of diet-related NCDs, showed that only six relatively wealthy countries mentioned cardiovascular disease care in their healthcare packages.[76] Additionally, delivering NCD services is hampered by human resource gaps at local levels, especially in poor, rural areas.[77]

On a more positive note, there are examples emerging in high-income countries of how the health services can play a role in preventing obesity and diet-related NCDs by ensuring the food they serve supports health. Spotlight 3.2 highlights one such example.

Equity and inclusion

Improving nutrition is essential in the fight against poverty (SDG 1), gender inequality (SDG 5) and low-quality education (SDG 4), in promoting inclusive economic growth (SDG 8) – and across all of these – in reducing inequalities (SDG 10). At the same time, addressing poverty, working conditions (SDG 8), education, gender and inequalities will improve nutritional outcomes.

It is hard to disentangle the direction of these associations. However, it can be said with confidence that improved nutrition is a platform for better outcomes in education, particularly improved school performance, employment and female empowerment, as well as reduced poverty and inequality.[78] Addressing stunting and micronutrient deficiencies, such as iron and iodine, improves children's ability to attend and perform at school and increases their chances of achieving a complete education.[79] Healthy, good-quality diets are associated with improved performance at school.[80] Children who are less affected by stunting early in their life have higher test scores on cognitive assessments and activity level.[81] A well-nourished girl or woman experiences a range of positive effects including benefits to her health, further school attainment, income generation, control over her resources and the ability to make decisions, including delaying early marriages and pregnancies.[82]

Education in turn is associated with improved nutritional outcomes. Mothers who have had quality secondary school education are likely to have significantly better nourished children.[83] This highlights the need to ensure girls stay in education – yet the primary school dropout rate is significantly higher among adolescent girls than boys in Africa, the Middle East and South Asia.[84]

To achieve equality and improve nutrition outcomes also requires attention on women's maternity provision. Yet only just over half of countries where information is available meet the International Labour Organization standard of at least 14 weeks of maternity leave; and just 34% also have guaranteed funds for adequate maternity benefits.[85] In 18% of countries, there is no right to paid maternity leave at all, nor to paid nursing breaks on return to work, making it more difficult to breastfeed.[86] Breastfeeding is widely recognised as the best option for infant feeding from a nutritional perspective.[87] It protects against infant mortality and morbidity; increases intelligence; and is linked to a decreased risk of breast cancer for the woman. There is emerging evidence that it may also protect against obesity and diabetes later in life.[88] Other aspects of rights for women are also important for nutrition. For example, even though women globally do more agricultural labour than men, poor rural women often lack access to reliable income from their work. In many countries, women are denied the right to own land, access credit, make decisions or lead groups.[89]

SPOTLIGHT 3.2 INTEGRATING HEALTHY FOOD PROVISION AND ECONOMIC VIABILITY IN A LARGE METROPOLITAN HEALTH SERVICE, AUSTRALIA

Anna Peeters, Kirstan Corben and Tara Boelsen-Robinson

In Australia, Alfred Health is a large metropolitan health service, with three hospitals in the inner southeast suburbs of Melbourne. Recognising the importance of not only treating illness, but promoting health as well, in 2011 Alfred Health embarked on a project to improve the availability and promotion of healthier food and drinks offered at its three hospital sites.

Alfred Health worked with the government guidelines for the state of Victoria to implement 'Healthy Choices'[90] to improve the healthiness of the food served across its retail, vending and catering. One of the hallmarks of the Alfred Health method was its team approach, with strong leadership from the health service management, the appointment of a dedicated health promotion role and the development of a strong collaboration between the health promotion team and the food service retailers.[91]

From this collaborative approach came some novel trials, designed by the retailers and the health promotion team together to test the effectiveness and feasibility of different healthy food service retail strategies. They wanted to start with short-term trials to enable them to explore different strategies in a 'safe to fail' manner. Alfred Health partnered with teaching institutions, academics, independent research organisations and the state's health promotion foundation to resource the evaluation of these trials. Key partners included Deakin University, Behavioural Insights Team, VicHealth and the state Government of Victoria.

While working to improve all aspects of food and drink availability, Alfred Health focused its initial trials on changes to sugar-sweetened beverages. All involved agreed this had a strong health logic and was a contained and feasible target. Four sugary drinks trials were conducted: 1) Removing sugary drinks from display in a full-service café; 2) Removing sugary drinks from display in a self-service café; 3) Increasing the price of sugary drinks by 20% in vending machines; 4) Increasing the price of sugary drinks by 20% in a convenience store outlet. These approaches were supported by the retailers as they were seen to be maintaining customer choice while promoting the choice of healthier alternatives.

All four trials were successful. In all four cases the sales of sugary drinks decreased substantially and the sales of the healthiest drink alternatives, such as water, increased. In the trials removing the sugary drinks from display the sales of 'diet' alternatives (drinks with non-caloric sweeteners) increased. In contrast, in the price trials the sales of these 'diet' drinks decreased alongside those of sugary drinks. The strategies are continuing to be implemented in the hospitals, either as initially implemented or with some amendments.

All four trials also showed that the changes were economically viable, with either the number of items sold, or the revenue returned, remaining the same during the trial. Customer surveys indicated most customers were not aware of the changes, and once made aware were supportive. This was seen as a significant success for both Alfred Health and its retailers.[92] In one of the trials, where sugary drinks were removed from display in a self-service café, sales of sugary drinks decreased from 40% of all cold drinks sold to only 10%.[93] Across all these drinks initiatives Alfred Health estimates it now sells 36,500 fewer sugary drinks at its main hospital each year.

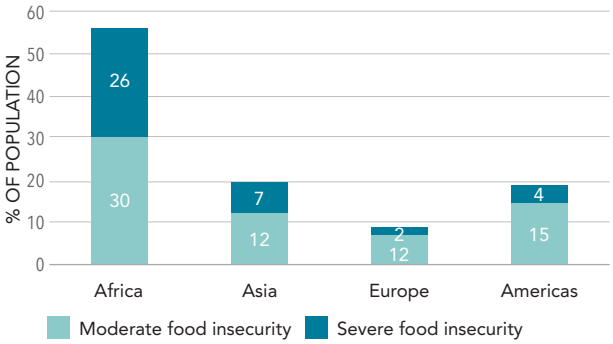
Alfred Health became the first Victorian health service to exceed the state government targets, reaching 56% availability of healthy foods and drinks (up from 30% in 2011) and reducing availability of unhealthy foods and drinks to 15% (compared with 42% five years earlier). Several factors are perceived by those at Alfred Health as having contributed to the success of these four trials and the implementation of healthy choices more generally across catering, vending and food service. These include taking a long-term perspective with ongoing support and resourcing; developing and managing the multiple stakeholder relationships; and using consistent messages on why the policy was being introduced between all those involved. Challenges included identifying popular, healthy alternative products and continually monitoring and rating the available products.

Poor nutrition is strongly correlated with poverty, low incomes and indeed with low economic growth. A fifth of the global population – 767 million people – live in extreme poverty (defined as a daily income below $1.90). Their nutrition burden is significant: 46% of all stunting falls in this group.[94] Poor nutrition elevates risk of poverty: we know that 43% of children under five in low and middle-income countries are at elevated risk of poverty because of stunting.[95] It is estimated that stunted children earn 20% less as adults than non-stunted children do,[96] whereas well-nourished children are 33% more likely to escape poverty as adults.[97] Indeed, wage rates correlate well with degrees of stunting – each added centimetre of adult height can be matched with an almost 5% increase in wage rates.[98] Similarly, an analysis of 29 countries showed that both stunting and wasting are associated with GDP growth. The prevalence of stunting declines by an estimated 3.2% for every 10% increase in income per capita. And a 10% rise in income translates into a 7.4% fall in wasting.[99] This does not prove that better nutrition drives higher wages or economic growth – the figures are more likely to show that higher wages or economic growth lead to better nutrition. But it does show the value of using specific nutrition measures to inform wider policy and influence those concerned with poverty reduction and economic growth.

The association between poverty, low levels of education and other forms of deprivation, and obesity and diet-related NCDs is more complex. In high-income countries, the incidence of diet-related NCD risk factors such as obesity is highest among poorer, less-educated groups.[100] More complex inequality patterns for obesity and associated health conditions are seen in low and middle-income countries, and depend on the economic and epidemiological development and state of the country.[101] In some countries the burden is higher among groups of lower socioeconomic status, but not in others. Notably, however, the shift in burden towards populations of lower socioeconomic status happens at lower levels of economic development.[102] Evidence also shows that groups of lower socioeconomic status in low and lower-middle-income countries eat less fruit, vegetables, fish and fibre than those of higher socioeconomic status.[103] Unlike undernutrition, economic growth is actually associated with an increase of obesity. It is estimated that a 10% rise in income per capita translates into a 4.4% increase in obesity – meaning that measures must be put into place to counteract this risk as economies develop.[104]

One influence on nutrition experienced in high, middle and low-income countries is household food insecurity. The Food and Agriculture Organization (FAO) has adapted a Food Insecurity Experience Scale ('FIES') based on scales developed in the Americas to ask people about their *experience* of food insecurity.[105] The questions ask people about common experiences which affect people who have too few resources to ensure they get enough to eat. Figure 3.6 shows that food insecurity is particularly high in Africa, but even in Europe 9% of households experience moderate or severe food insecurity. This finding from higher-income countries indicates that the same households can be at risk of both obesity and food insecurity, an interaction which requires more in-depth research.[106]

FIGURE 3.6: Prevalence of moderate to severe food insecurity, by region



Source: Authors, based on data from the Food and Agriculture Organization's Food Insecurity Experience Scale (FIES) database.[107]

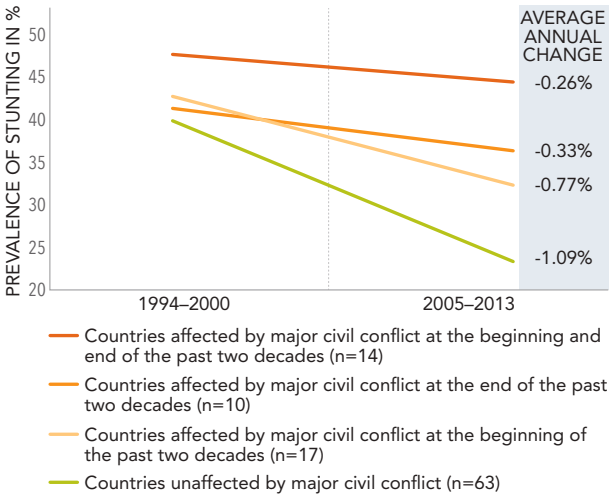
Peace and stability

Food insecurity is also fundamentally intertwined with peace and stability. Violent, armed conflict can lead to the destruction of crops, livestock, land and water systems, as well as disruptions to transport infrastructure, markets and the human resources required for food production, processing, distribution and safe consumption.[108] Food is often used as a weapon, with both insurgents and governments wilfully disrupting civilians' access to food in order to create severe food insecurity that weakens and demoralises potential opponents.[109] The legacies left by decades of competition over resources, and the food price spikes of 2008, have been credited with initiating social unrest, conflicts and political demonstrations in more than 50 countries.[110] They have also been a contributory factor to the current famine in South Sudan.[111] Long-term instability can exacerbate food insecurity in many ways, including loss of assets and livelihoods, competition over natural resources, increased disease, reduced access to health and social services and poor governance.[112] All of these further reduce people's resilience and governments' capacity to respond to natural disasters such as droughts.

This instability is also associated with malnutrition. In the worst-case scenario, conflicts can lead to famines – as in South Sudan now (Chapter 1). It is thus no surprise that the proportion of undernourished people living in countries in conflict and protracted crisis is almost three times higher than that in other developing countries.[113] Most of the countries currently experiencing conflict are classified by FAO as 'low-income food deficit' and have high burdens of undernourishment and stunted children.[114] While these could be effects as well as causes of violence, it is striking that child malnutrition rates have been found to be 50% higher, and undernutrition rates 45% higher, at the point when conflict breaks out in countries.[115] Positive nutrition outcomes, such as reduced stunting, are also far easier and quicker to achieve where conflict is absent[116] (Figure 3.7). There is also evidence that displaced people experience a double burden of malnutrition.[117] Thus achieving peace (SDG 16) is needed to end malnutrition in all its forms.

In the other direction, improving nutrition through investing in nutrition resilience has the potential to unite communities around a cause and provide an opportunity for long-term change. Improved nutrition can help communities, societies and nations thrive and contribute to long-term peace and stability. A good starting point would be community-based management for acute malnutrition programmes, and social protection schemes for those who may be vulnerable to food price shocks. It would also help to link humanitarian relief interventions with longer-term approaches that stabilise food prices and grain stocks. By investing in short and long-term approaches, not only can we bring humanitarian and nutrition practitioners together, we can mitigate potential social unrest and future conflicts.[118]

FIGURE 3.7: Conflict and progress on reducing stunting



Source: Reproduced with permission from the International Food Policy Research Institute www.ifpri.org. The original figure is available online at http://dx.doi.org/10.2499/9780896295759.[119]

Conclusion: Improved nutrition is needed to achieve the SDGs

There are many connections across the SDGs for nutrition. But we cannot afford to assume that these will be made automatically. As the *Global Nutrition Report 2016* noted, even where the links seem obvious, such as between nutrition and poverty, social protection programmes to address poverty typically do not incorporate nutrition.[120] Without consciously mapping the connections in the SDGs, there is a serious risk "that sectoral perspectives could undermine the holistic and integrated development vision of the 2030 Agenda and lead to business-as-usual."[121] But this mapping will not happen by itself. It is up to the nutrition community to demonstrate the clear paths towards mutual agenda setting and support.

Getting nutrition commitments cemented into other sectors' plans and strategies at global, national and programme levels will demand lengthy and sensitive negotiation, backed up with robust evidence of how we can help. Recognising the need to agree common strategies will not develop overnight. It will require proactive and persistent persuasion. It will likewise involve acknowledging conflict where policies and strategies designed to achieve other SDG outcomes are counter to nutrition goals. The nutrition community can and should reach out to communities working across the SDGs and actively offer to help them achieve their goals. Our analysis of the connections indicates some of the key sectors to engage with first. Some, like sustainable agriculture, are obvious. In some cases, such as water, sanitation and hygiene and health systems, precedents for collaboration have already been set. Others, like engaging with people who invest in infrastructure, are newer departures.

Chapter 2 shows we are not on target to reach global nutrition targets, which will mean failing to deliver the SDG targets 2.2 and 3.4. Success throughout the SDGs will be needed to deliver these nutrition targets. And if we fail to deliver these targets, it will in turn hamper efforts to achieve the goals the world has set itself for development.

4 Financing the integrated agenda

Key findings

1. Domestic spending by governments on interventions to address undernutrition varies from country to country, with some spending over 10% of their budget on nutrition and others far less.
2. Global spending by donors on undernutrition increased by 1% (US$5 million) between 2014 and 2015 and fell as a proportion of official development assistance (ODA) from 0.57% in 2014 to 0.50% in 2015.
3. Spending on prevention and treatment of obesity and diet-related non-communicable diseases (NCDs) represented 0.01% of global ODA spending to all sectors in 2015 even though the global burden of these diseases is huge. Some donors are leading the way in bucking this trend but considerably more investment needs to be put on the table. Overall there is inadequate data on domestic government spending on obesity and diet-related NCDs, including by high-income countries. As a result, we know very little about how much is being spent, on what, and by whom.
4. There are opportunities to take a more 'double duty' approach to spending on undernutrition, obesity and diet-related NCDs. One way to start would be to redefine the code used to track development spending on nutrition to enable it to more effectively track what is spent, and how, on all forms of malnutrition.
5. Governments invest more in nutrition indirectly ('nutrition-sensitive' spending) than they do on nutrition interventions directly ('nutrition-specific' spending). Nutrition-sensitive spending presents an opportunity for financing a more integrated agenda. To inform this process we need to better track what impact this spending has on nutrition and other development goals.
6. Achieving global nutrition targets for all will require more domestic financing and development assistance. Delivering integrated action across the SDGs also demands looking to more innovative financing mechanisms and leveraging investment flows for multiple wins in multiple sectors. An integrated view of investment across the SDGs will be crucial if we are to deliver universal outcomes for nutrition.

Implementing the SDGs in an integrated way to achieve global nutrition targets, universally, will require new investment and spending these investments differently.[1] This chapter tracks progress on the financing of nutrition following calls in the *Global Nutrition Report 2016* to "invest more and allocate better" (p.xxi).[2] It assesses government and donor spending on essential 'nutrition-specific interventions' designed to improve nutrition survival, cognitive development and nutrition and health outcomes. It also assesses so-called 'nutrition-sensitive' spending. Nutrition-sensitive spending includes budget line items allocated to sectors that broadly address the underlying causes of nutrition (such as access to drinking water, sanitation, education and social protection), as well as programmes, interventions or services of which nutrition is one goal but that are not defined as nutrition-specific interventions (such as programmes that both benefit agricultural producers and have the potential to achieve dietary diversity). Finally, it tries to assess spending on obesity and diet-related NCDs, although we are hampered by a lack of data on how funds are allocated and spent on these conditions.

The aim of tracking financing in the Global Nutrition Report is to provide stakeholders, particularly civil society, with data to help hold governments and donors more accountable for financing actions to accelerate nutrition improvements. Tracking spending can provide insights into how to achieve the shared agenda set out in Chapter 3. It demonstrates the funding gaps in established, costed maternal and child undernutrition interventions and the obesity and diet-related NCD agenda. It also raises questions about the need for new avenues of funding and a better understanding of how to leverage existing investment flows.

Investments to address undernutrition[3]

Government investments in nutrition-specific and sensitive interventions to address undernutrition

Here we present the results of a budget analysis conducted by 41 countries in the Scaling Up Nutrition (SUN) Movement in 2015 and 2016 as part of its efforts to track spending for advocacy, planning and impact. Of a potential 41 countries who had prepared nutrition budgets in 2017, 37 were included in the analysis (those excluded either did not have a complete analysis done or the results were not validated by the SUN Government Focal Point). Countries examined their national budgets to identify government spending on nutrition-related programmes and assessed the amount allocated to nutrition-specific and nutrition-sensitive interventions (see Appendix 3 for more detailed methodology). Spotlight 4.1 stresses why nutrition budget analysis is critical for advocacy, programme planning and funding accountability.

SPOTLIGHT 4.1 THE IMPORTANCE OF NUTRITION BUDGET ANALYSES

Alexis D'Agostino, Helen Connolly, Chad Chalker

In its report *Investment Framework for Nutrition*, the World Bank estimated that an additional US$7 billion is needed annually to maximise the contribution of nutrition-specific interventions to achieving four of the maternal infant and young child nutrition (MIYCN) targets for 2025 (stunting, wasting, anaemia and exclusive breastfeeding).[4] Yet advocating for more resources to tackle nutrition, at both national and global levels, is hampered by incomplete information on current commitments and spending. What is more, identifying funding and programming gaps can be particularly challenging for nutrition, as funding is spread across different sectors. With an increased focus on nutrition, it is vital to ensure there is enough funding for it – and that this funding goes where it is needed.

Nutrition budget analysis identifies nutrition-related activities that countries have included in their budgets and how much funding has been allocated to support them. Budget analysis findings can be useful for advocacy, programme planning and funding accountability.

Some countries have begun conducting nutrition budget analysis to meet this need for clear, accurate data on nutrition budgets and spending – approximately 40 countries at the time of writing. The USAID-funded SPRING (Strengthening Partnerships, Results and Innovations in Nutrition Globally) project conducted interviews with key stakeholders from seven of the countries, with more planned for the future. These interviews revealed many advantages and opportunities, such as those described here.

Budget analysis exercises result in a wide variety of learning experiences.

These experiences include advocacy, policy and legislative outputs and can serve as examples for using similar analyses in other countries. Findings were used for purposes as diverse as informing nutrition champions in the parliament in Malawi to helping the Ministry of Health advocate for more nutrition funding mechanisms in Tajikistan.

Budgeting is a complex process but offers many opportunities to advocate for nutrition.

Findings from budget analyses can be used throughout the planning cycle. But to use data effectively requires a strong understanding of both the budget cycle and nutrition programming. For example, nutrition stakeholders in Papua New Guinea worked with colleagues from the Department of National Planning and Monitoring to link findings from the budget analysis into the budgeting and prioritisation process.

There are many ways to present findings.

The goals of the budget analysis project – to advocate, plan or account for nutrition funding – were similar from country to country. But the outputs differed according to methodology followed and target audience. Tanzania conducted the first public review on nutrition spending, and presented the findings to policymakers to raise awareness of the need for increased nutrition funding. The exercise led to increased budget allocations and nutrition budgeting guidance for local authorities. Meanwhile, Malawi used findings from its national budget analysis exercise to engage district officials as advocates for nutrition.

The process of sharing findings from budget analysis evolves over time.

As stakeholders change and the audience becomes savvier, the types of budget analysis and the presentation of the findings also change. Nepal has defined a clear purpose for each round of its data analysis, ensuring that the findings can be applied to current challenges or information gaps. In Zambia, each round of budget analysis has helped guide local government to engage in the nutrition budgeting process at the right time.

Use of the findings offers a chance to expand the definition of the nutrition stakeholder.

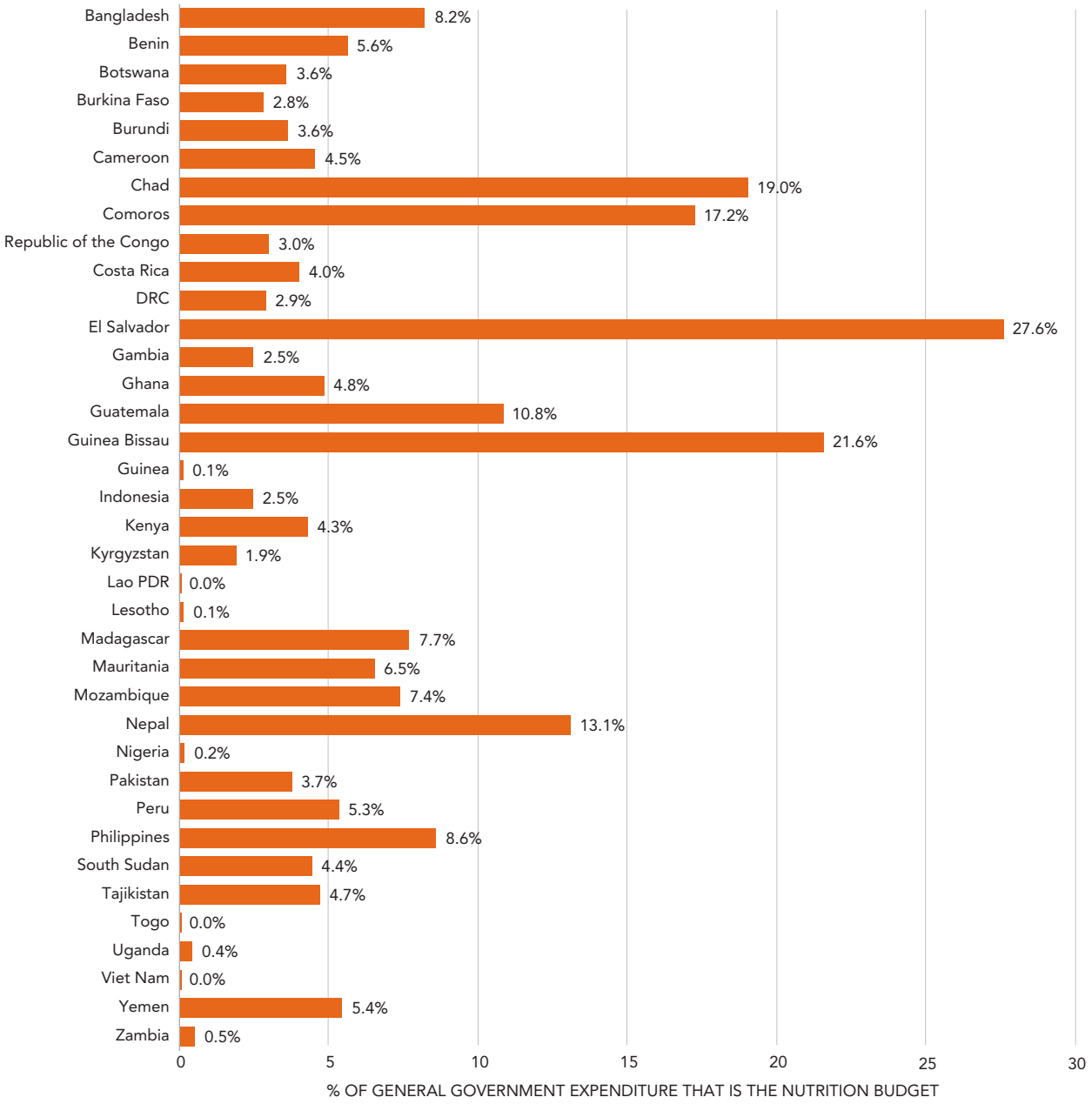
Although budget analysis itself often involves a limited number and type of stakeholders, sharing and discussing the findings offers a chance to involve a wide range of actors, defining a broad nutrition community. Countries reported working with a variety of stakeholders to use findings from the budget analysis exercises, from district-level officials in Malawi to donors in Tajikistan. And Zambia has taken advantage of the budget analysis process to engage new nutrition stakeholders.

Sharing findings can be a way to educate and advocate for more detailed analysis in the future.

While budget analysis findings may initially be used just to raise awareness of the issue, they can also be used throughout the planning and funding process, and even during the accountability phase. In Zambia, the exercise identified a need to establish set practices for reporting. This led to more frequent and detailed annual budget tracking reports to hold stakeholders and the government accountable on commitments made and ensure nutrition remains a priority. In the Philippines, the goal for future exercises is to work more closely with the Department of Budget Management to state how much funding is set aside for nutrition on specific activities in every budgeted programme.

These experiences suggest that nutrition budget analysis findings can be useful to decision-makers and an effective tool for accountability in the nutrition sphere. Budget analysis can only affect funding allocations and spending for nutrition if the findings are used and convincingly shared with decision-makers. There are many ways to do this. Documenting and sharing country experiences will allow for additional learning and more robust use of findings.

FIGURE 4.1: Budget allocations to nutrition-specific and nutrition-sensitive interventions, 37/41 countries, 2017

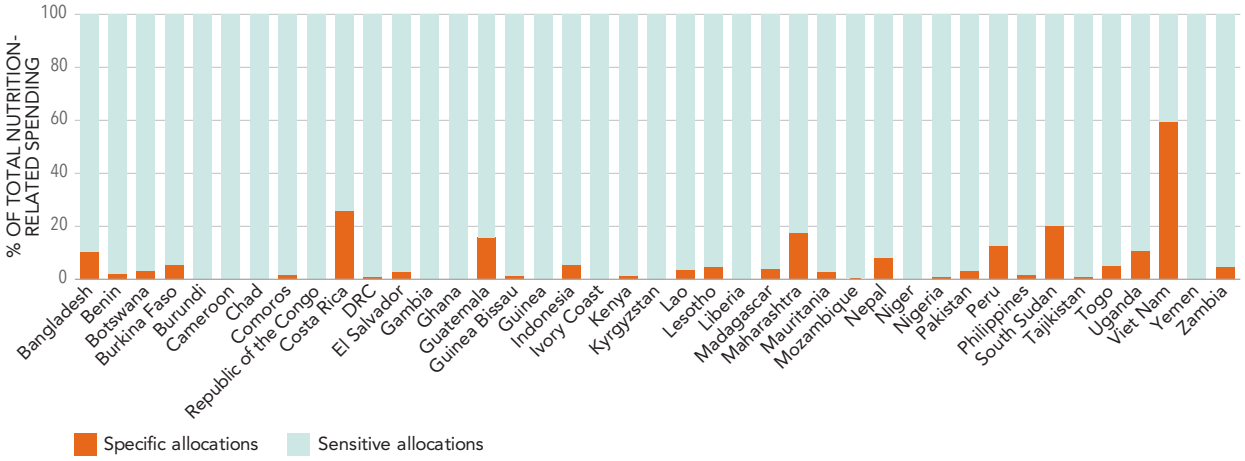


Source: Country budget analysis.

Notes: This considers total budget allocations and therefore represents the maximum amount that could go towards nutrition. DRC: Democratic Republic of the Congo; Lao PDR: Lao People's Democratic Republic.

Figure 4.1 shows the percentage of national budgets dedicated to nutrition-specific and nutrition-sensitive interventions in 37 of the 41 countries that took part in the budget analysis.[5] Chad, Comoros, El Salvador, Guatemala, Guinea Bissau and Nepal have demonstrated commitment to investing in nutrition by allocating over 10% of their general government spending on nutrition-specific and sensitive interventions. However, there is no benchmark for countries on how much of their total national budget should be dedicated to nutrition. This is likely to be very context-specific and depend on the underlying causes of malnutrition. Data from the total 41 countries in Figure 4.2 shows that most domestic investment was in nutrition-sensitive interventions except in Viet Nam.

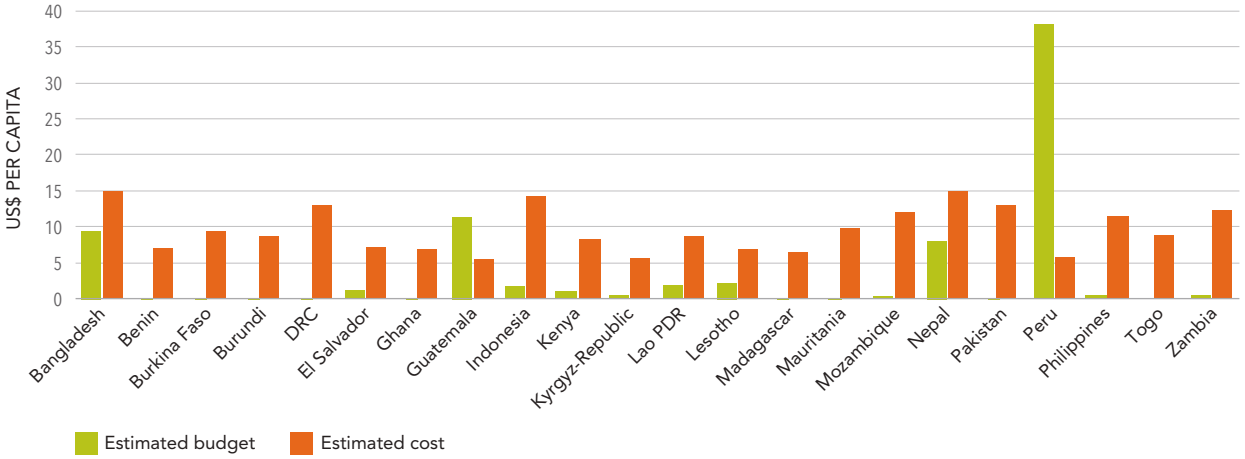
FIGURE 4.2: Total nutrition-related spending as nutrition-specific and sensitive allocations, 41 countries, 2017



Source: Country budget analysis.

Notes: 100% represents total nutrition-related spending. DRC: Democratic Republic of the Congo.

FIGURE 4.3: Estimated gap in funding for nutrition-specific interventions to achieve MIYCN targets, 22/41 countries, 2017



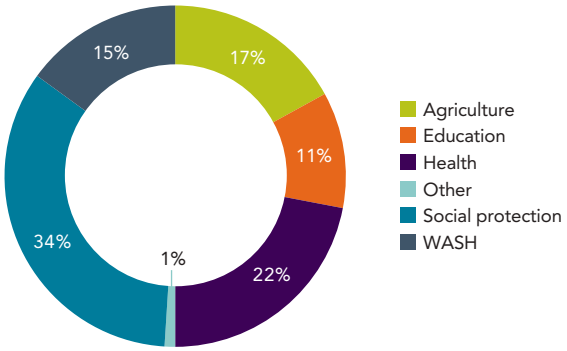
Source: Country budget analysis.

Notes: Chart shows a subset of countries for which there is an estimate of the costs and of current detailed funding based on the budget analysis. For Bangladesh, Ghana, Guatemala, Indonesia, Kenya, Mozambique, Peru and Togo the reported figure is from mixed sources of funding (domestic and external). The reported figure for the remaining countries is only from domestic funding. This estimate does not incorporate funding that is not reported in national budgets. DRC: Democratic Republic of the Congo; Lao PDR: Lao People's Democratic Republic.

An analysis between 2013 and 2015 of 25 countries with at least two data points showed that nutrition-sensitive intervention spending has increased on average 4% (n=25 countries) over time and nutrition-specific intervention spending has increased on average 29% (n=21 countries). Nutrition-specific intervention spending rose more, with countries including Democratic Republic of the Congo (DRC), Mauritania, Madagascar and Nepal increasing spending on nutrition-specific programmes by over 100%. At the same time, countries including Indonesia, Lao PDR and Zambia increased spending on nutrition-sensitive interventions by over 50%.

Figure 4.3 compares the estimated budgets of 22 countries with detailed budget line items for essential nutrition-specific interventions including supplementing vitamin A, promoting infant and young child feeding, supplementing iron and folic acid to pregnant and lactating women, treating severe acute malnutrition and fortifying foods with cost estimates of what is needed to *fully fund* such interventions.[6] The data shows that nearly all countries' budgets are falling short of the estimated costs needed to maximise the contribution of nutrition-specific interventions to achieving MIYCN targets (Figure 4.3).[7] The exceptions are Guatemala and Peru.

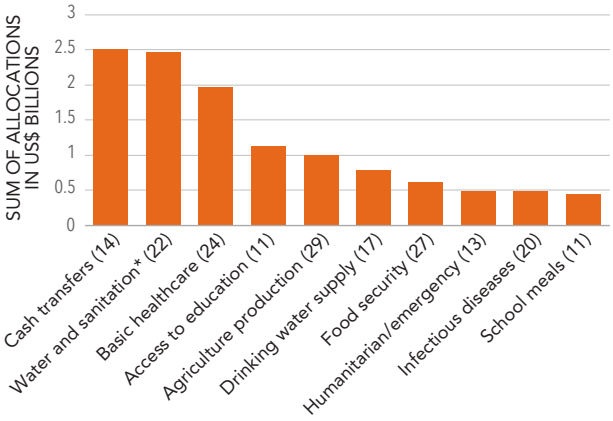
FIGURE 4.4: Share of nutrition-sensitive allocations by sector, 37/41 countries, 2017



Source: Country budget analysis.

Notes: WASH: water, sanitation and hygiene.

FIGURE 4.5: 10 types of nutrition-sensitive programmes with the biggest share of spending, 37/41 countries, 2017



Source: Country budget analysis.

*Notes: The numbers in brackets show how many countries have included the type of programme in their budget analysis. *Combined drinking water supply and sanitation.*

Of the 41 countries that undertook the budgetary analysis, 37 have also analysed their national budgets to assess investments in nutrition-sensitive interventions across at least three of five key sectors: health, education, agriculture, social protection and water, sanitation and hygiene (WASH). Although there is no common pattern across all countries, the highest share of nutrition-sensitive allocations is found in the social protection sector (34%) followed by health (22%), agriculture (17%),[8] WASH (15%) and education (11%) (Figure 4.4). The biggest share of spending across the five sectors is dominated by a few types of programmes – cash transfers, programmes to enhance both drinking water supply and sanitation facilities, and spending for basic healthcare have the relative biggest shares (Figure 4.5). Interestingly, more countries are also investing in agriculture and food security but with smaller amounts of spending.

Donor and multilateral organisations' investments in nutrition-specific and sensitive interventions to address undernutrition[9]

Investments by donor and multilateral organisations to improve nutrition in countries with significant burdens of undernutrition are critically important, particularly for countries with small overall budgets to spend on development. This section uses ODA spending data reported to the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC), taken from the Creditor Reporting System (CRS) database to track nutrition investments by key donors. Most of the data shown here has been provided to the OECD DAC CRS, except where noted as self-reported data, and analyses spending defined as 'basic nutrition' according to the purpose code in the CRS.[10] Better ways of tracking ODA are shown in Spotlight 4.2 and include redefining this basic nutrition code, and developing a nutrition policy marker.

SPOTLIGHT 4.2 IMPROVING TRACKING OF DONOR AID FOR NUTRITION

Mary D'Alimonte and Augustin Flory

Tracking of investment for nutrition is important to tell us 1) how much funding for nutrition is mobilised each year, 2) where the largest contributions are coming from, and 3) to what extent funding is targeted to interventions that work in areas that need assistance most. However, there are challenges and gaps in the current system of resource tracking, notably in the case of donor aid through ODA.[11]

Figure 4.6 shows how ODA moves from donor countries to implementing agencies in recipient countries. The OECD's CRS can be used to extract the amount of aid for nutrition. Yet the basic nutrition purpose code – which is often used as a proxy for nutrition-specific investments – includes large nutrition-sensitive investments like school feeding. A second challenge is that nutrition-specific interventions may be reported as part of wider maternal and child health programmes and not captured under the basic nutrition code. And third, some nutrition interventions are delivered through emergency response and systematically coded as such and therefore not captured under basic nutrition.

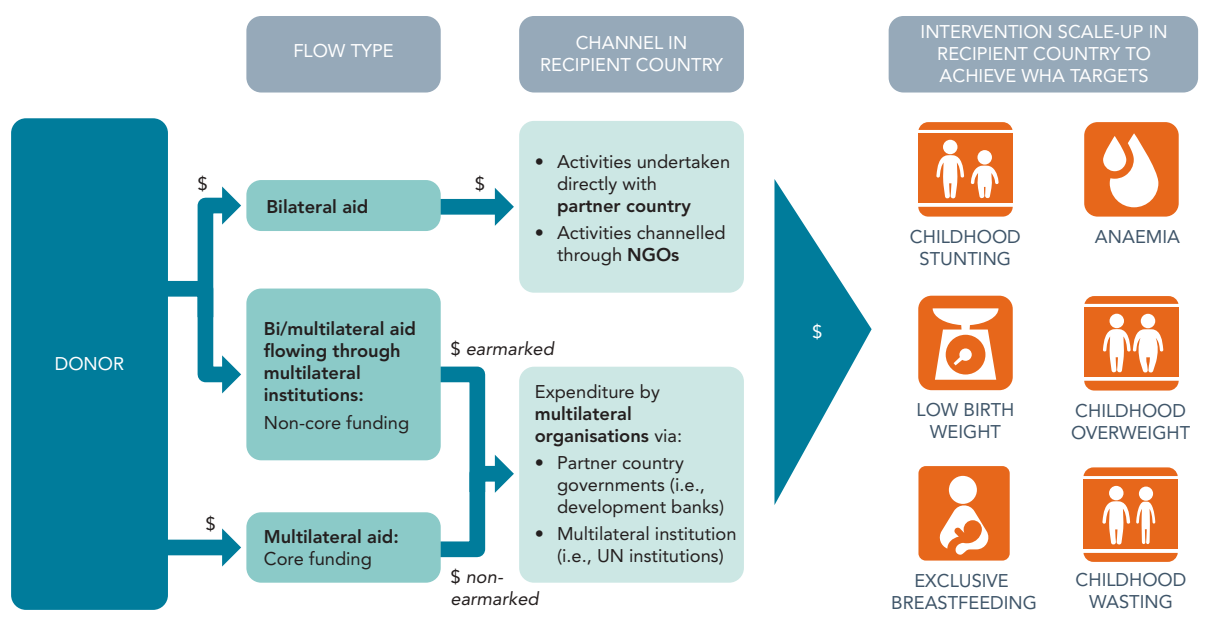
Together, these reasons make the basic nutrition code an imperfect proxy for donor aid for nutrition-specific investments. On top of this, there is no systematic and standardised way for the CRS to capture cross-cutting nutrition-sensitive investments across sectors.

One recommendation to improve the way nutrition is captured in the CRS is by redefining the basic nutrition code to better align to the concept of nutrition-specific interventions. A redefined code would also capture any investment that supports the scale up of those interventions, including research, governance and policy support. Another recommendation is introducing a nutrition policy marker to identify nutrition investments across sectors, which would allow for tracking in a more integrated way. A nutrition policy marker would identify projects across health, emergency response, agriculture, education and any other nutrition-sensitive sector that has nutrition goals, targets and activities. It would cover investments aimed at preventing overweight and obesity and diet-related NCDs. The policy marker would also track the number of projects meeting the nutrition-sensitive inclusion criteria – defined by the SUN Donor Network as any project with nutrition goals, indicators and activities – and would quantify nutrition-sensitive investments made across sectors (see Appendix 3 for more on methodology).

A nutrition policy marker would be similar to existing markers available for gender and climate change, which, like nutrition, are cross-cutting thematic areas in development that span many sectors. Instating this marker system for nutrition would enable a researcher or data user to extract all relevant nutrition investments (including total disbursement or commitment amounts) across sectors and purpose codes.[12] There is also a new proposed code for NCDs which will include "Exposure to unhealthy diet: Programmes and interventions that promote healthy diet through reduced consumption of salt, sugar and fats and increased consumption of fruits and vegetables e.g. food reformulation, nutrient labelling, food taxes, marketing restriction on unhealthy foods, nutrition education and counselling, and settings-based interventions (schools, workplaces, villages, communities)."[13]

With these changes, the nutrition community will be able to routinely capture information on the nutrition financing landscape to inform policy, planning and advocacy efforts. The data will show how much is being spent by which donors, going to which countries, and through which channels (such as through the multilateral system, public channels and non-governmental organisations (NGOs)). This information is essential to promote sustainable financing and development efforts.

FIGURE 4.6: ODA resource flows in the DAC system



Source: Adapted from OECD Stat.

Notes: WHA: World Health Assembly.

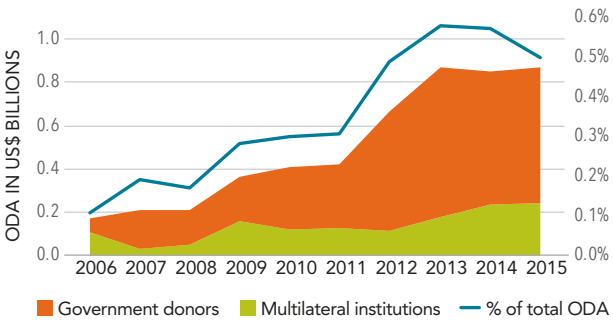
Donor and multilateral investments on nutrition-specific interventions

The total amount of ODA spent on nutrition-specific interventions has changed over the past 10 years (Figure 4.7). Global ODA spending on nutrition-specific interventions grew annually between 2006 and 2013. Since then, and in real terms, it plateaued in 2014 and increased only slightly between 2014 and 2015. Spending reached US$867 million in 2015, up 2% from the US$851 million spent in 2014. But this remains less than the US$870 million spent in 2013. This is despite estimates that US$70 billion will be needed over the next 10 years to maximise the contribution nutrition-specific interventions make towards achieving the four MIYCN targets for 2025 for stunting, wasting, anaemia and exclusive breastfeeding, with a 'priority package' of interventions costing US$23 billion.[14] It should be noted that this estimate does not include how much investment should be made towards nutrition-sensitive interventions over the next decade. Gaining a better understanding of how much should be invested across nutrition-sensitive interventions and in which sectors will be key to achieving the MIYCN targets.

DAC country donors[15] continued to provide most (72%) of the global spending on nutrition-specific interventions in 2015. Other providers reporting to the OECD DAC spent US$5 million, equal to 1% of the global total. Multilateral institutions contributed the remaining 28% – US$242 million in 2015.

Collective spending by DAC country donors increased by 1%, or US$5 million, between 2014 and 2015. Yet spending remains lower than in 2013. Spending by multilateral institutions also increased, by 3% or US$7.1 million, surpassing levels in any previous year. Despite the total increase, the amount spent on nutrition-specific interventions as a proportion of ODA has fallen, from 0.57% in 2014 to 0.50% in 2015. This is because total ODA spending globally (in all sectors) has increased at a greater rate than nutrition-specific spending.

FIGURE 4.7: Government and multilateral ODA spending on nutrition-specific interventions, 2006–2015



Source: Development Initiatives based on OECD DAC Creditor Reporting System.

Notes: Amounts are gross disbursements in constant 2015 prices.

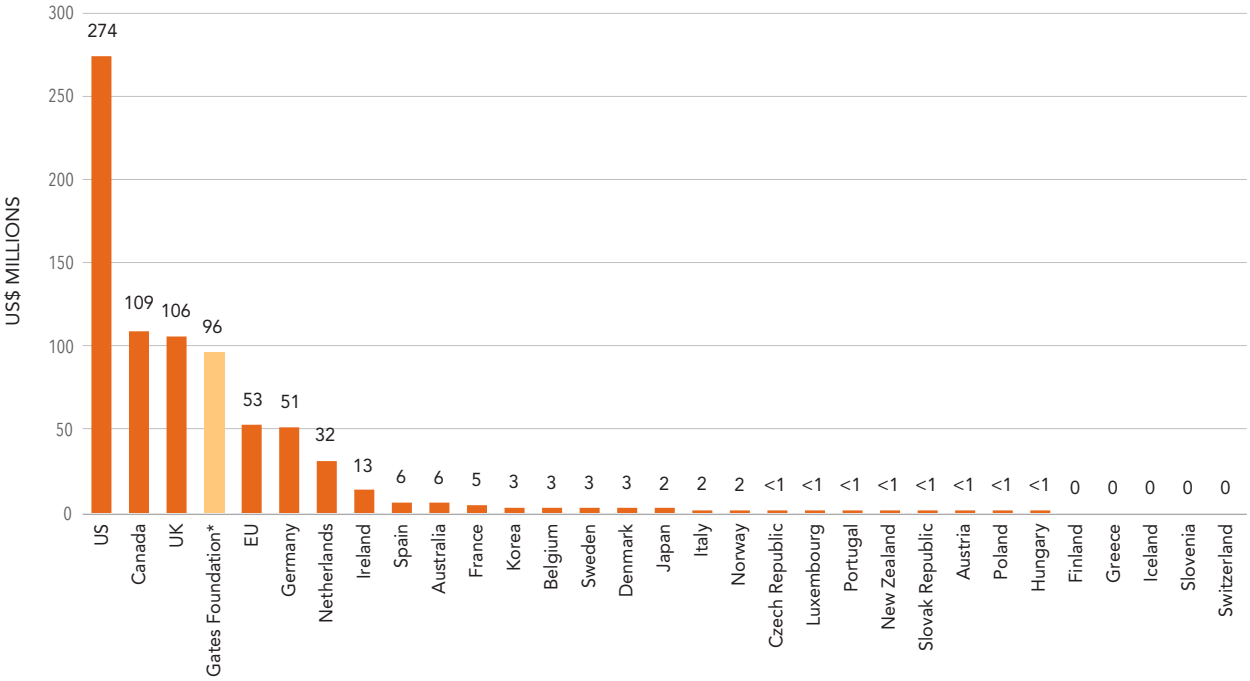
Most global spending continues to be provided by certain DAC members, namely the US, Canada, the UK, the EU and Germany (Figure 4.8). These five donors provided 68% of all disbursements in 2014. The US alone accounts for 32% of total spending, and continues to spend the single greatest amount of any country donor (US$274 million in 2015) followed by Canada (US$109 million), and the UK (US$106 million).

Between 2014 and 2015, spending on nutrition-specific interventions by 14 DAC country donors increased. Spending by the US and the UK rose the most, by US$46 million and US$20 million respectively. Disbursements from Germany, Republic of Korea, the Netherlands, Norway and Spain also increased, as did spending by the Czech Republic, Hungary, Italy, New Zealand, Poland, the Slovak Republic and Sweden, though to lesser extents (less than US$1 million each). Conversely, spending decreased for another 12 DAC members. At the same time, while nutrition-specific spending by the EU decreased by US$41.6 million, spending by other multilateral donors reporting to the OECD DAC also increased, by a net US$7.1 million and led by the International Development Association (IDA) (Figure 4.9).

Since 2014, 17 OECD DAC members have continued to disburse over US$1 million to nutrition-specific interventions. Eight countries reported spending under US$1 million each, and five countries report no nutrition-specific spending, though the combination of five has changed since 2014. If each donor spending less than US$1 million in 2015 increased their spending to reach the US$1 million mark, there would be an additional US$12.2 million available for nutrition-specific interventions.

Nutrition-specific spending was disbursed to at least 121 countries in 2015 but is still concentrated in just a few of the 121. Over half (50.5%) of all nutrition-specific ODA goes to just 14 developing countries although, as highlighted in chapter 2, the burden is significant across many countries. For example, Ethiopia, which has witnessed significant decreases in stunting over the last few years, received the greatest disbursements, equal to US$61 million in 2015. Guatemala, Malawi, Mozambique, Nepal and Yemen also received at least 4% of total nutrition-specific disbursements each (between US$48–33 million apiece). Between 2014 and 2015, Guatemala and Nepal had the greatest funding increases, at US$21 million and US$17 million respectively. Rwanda saw the largest decrease at US$23.9 million – 82% less than in 2014.

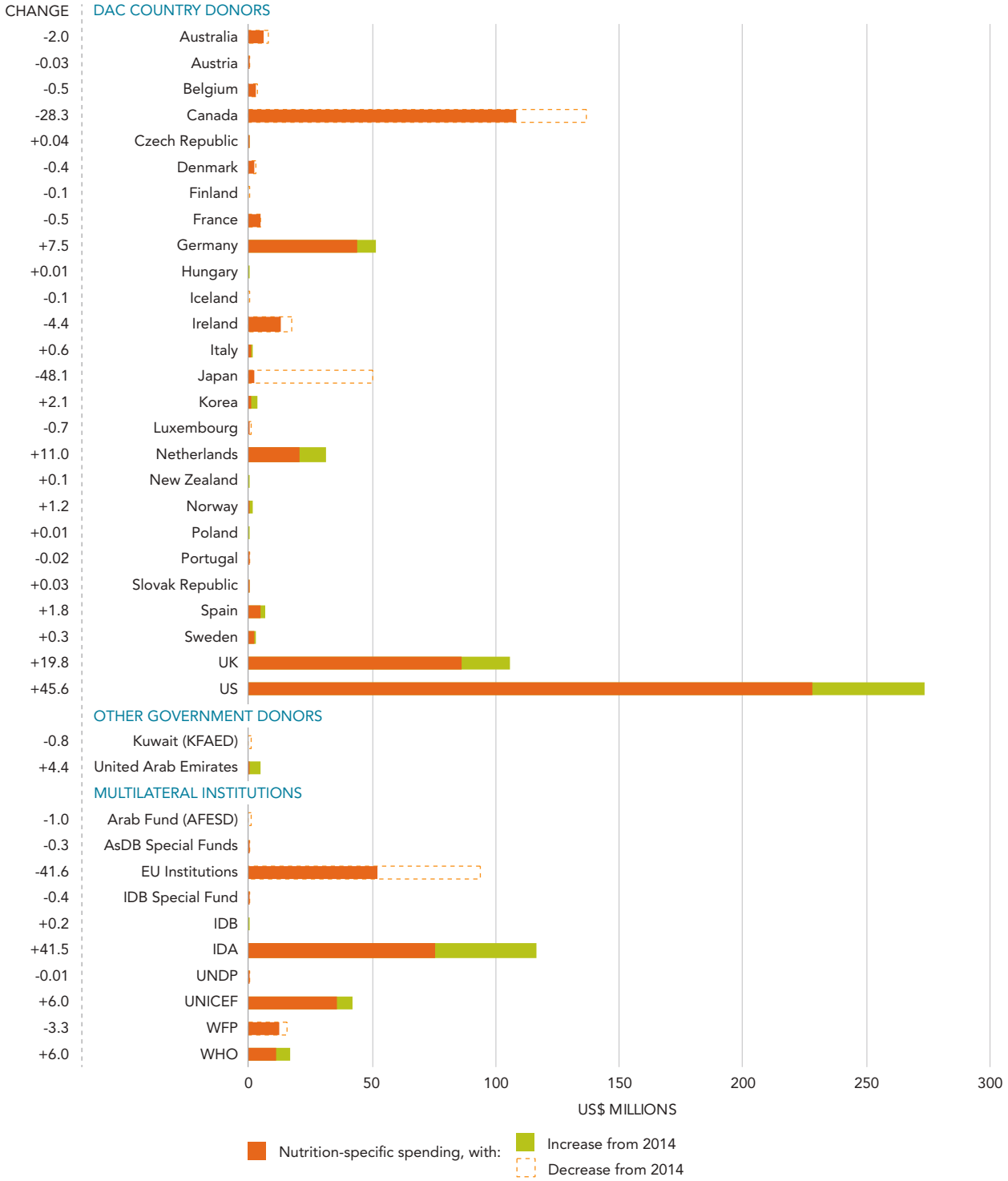
FIGURE 4.8: Nutrition-specific intervention spending by donors, 2015



Source: Development Initiatives based on OECD DAC Creditor Reporting System (CRS).

*Notes: Amounts are gross disbursements in constant 2015 prices. *Spending by Bill & Melinda Gates Foundation refers to private grants reported to the OECD DAC CRS. Korea: Republic of Korea.*

FIGURE 4.9: Changes from 2014 to 2015 in nutrition-specific spending by country donors and multilateral institutions



Source: Development Initiatives, based on OECD DAC Creditor Reporting System data. This is not self-reported data.

Notes: Orange bars show spending in 2014 if it has increased since 2014, or spending in 2015 if it has decreased since 2014. Green bars shows additional spending in 2015. Dotted bars show the decrease in spending in 2015. Amounts are based on gross disbursements in constant 2015 prices. AFESD: Arab Fund for Economic and Social Development; AsDB: Asian Development Bank; IDB: Inter-American Development Bank; IDA: International Development Association; KFAED: Kuwait Fund for Arab Economic Development; UNDP: United Nations Development Programme; UNICEF: United Nations Children's Fund; WFP: World Food Programme; WHO: World Health Organization.

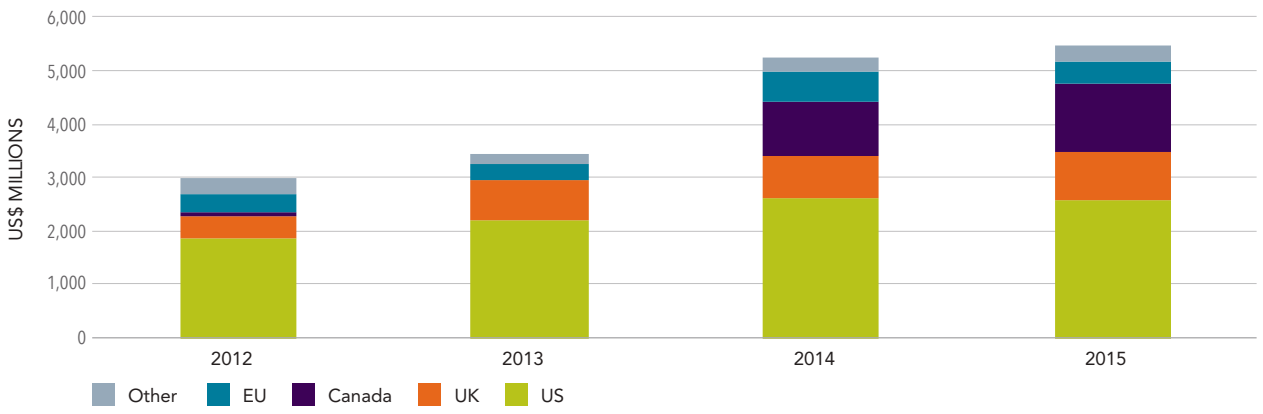
Donor investments in nutrition-sensitive sectors

This section uses spending data reported directly by donors to the Global Nutrition Report. Building on data reported in previous reports, the latest spending figures indicate that donor nutrition-sensitive spending continues to rise. Although disbursements data from the World Bank is not reported, and data from Australia is not captured this year because it reports data biennially, collective spending on nutrition-sensitive interventions grew by US$237 million between 2014 and 2015. The US, the UK and Canada once again provided the most funding (Figure 4.10).

Ten donors reported their nutrition-sensitive disbursements to the *Global Nutrition Reports 2016* and *2017*. Of these, seven donors reported greater spending in 2015 than in 2014: the Bill & Melinda Gates Foundation, Canada, the Children's Investment Fund Foundation, Germany, the Netherlands, Switzerland and the UK. Canada and the UK reported the most significant increases in spending, with disbursements up by US$273 million and US$148 million respectively. The remaining three donors reported less spending in 2015 than in 2014: the EU, Ireland and the US. The greatest fall was from the EU, which spent US$147 million less in 2015 than in 2014 (Figure 4.11).

Table 4.1 presents the donor self-reported data and its caveats. It is difficult to interpret spending trends over time based on this data, given the missing data and use of various methodologies to identify nutrition-sensitive spending.

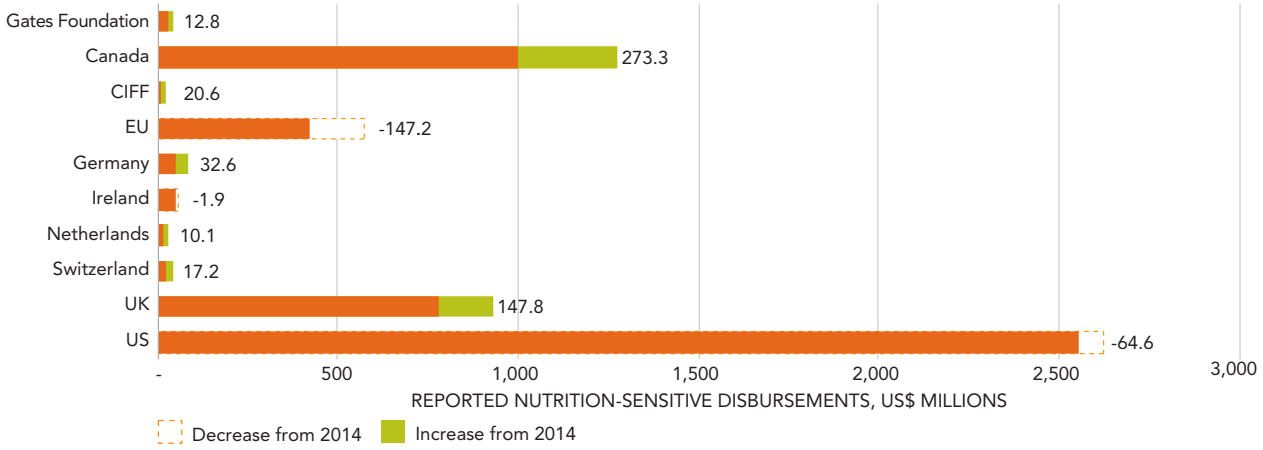
FIGURE 4.10: Nutrition-sensitive spending by reporting donors, 2012–2015



Source: Development Initiatives, based on data provided by the donors.

Notes: Data is not in constant prices. 'Other' includes Australia, Bill & Melinda Gates Foundation, Children's Investment Fund Foundation, France, Germany, Ireland, Netherlands and Switzerland.

FIGURE 4.11: Changes in nutrition-sensitive spending by donors, 2014 and 2015



Source: Development Initiatives, based on data provided by the donors.

Notes: Orange bars show spending in 2014 if it has increased since 2014, or spending in 2015 if it has decreased since 2014. Green bars shows additional spending in 2015. Dotted bars show the decrease in spending in 2015. Amounts are based on reported disbursements and are not in constant prices. CIFF: Children's Investment Fund Foundation; Gates Foundation: Bill & Melinda Gates Foundation.

TABLE 4.1: Nutrition disbursements reported to the *Global Nutrition Reports 2014–2017*, US$ thousands

DONOR	NUTRITION-SPECIFIC 2010	NUTRITION-SPECIFIC 2012	NUTRITION-SPECIFIC 2013	NUTRITION-SPECIFIC 2014	NUTRITION-SPECIFIC 2015
Australia	6,672	16,516	NA	20,857	NA+++
Canada	98,846	205,463	169,350	159,300	108,600
EU*	50,889	8	54,352	44,680	48,270
France**	2,895	3,852	2,606	6,005	4,660
Germany	2,987	2,719	35,666	50,572	51,399
Ireland	7,691	7,565	10,776	19,154	13,079
Netherlands	2,661	4,007	20,216	25,025	31,604
Switzerland	0	0	0	0	0
UK***	39,860	63,127	105,000	87,000	92,400
US+	8,820	229,353	311,106	263,240	382,891
Gates Foundation	50,060	80,610	83,534	61,700	96,500
CIFF	980	5,481	37,482	26,750	53,607
World Bank++	NA	NA	NA	NA	NA
13 donors total	272,361	618,701	830,088	764,283	883,010

DONOR	NUTRITION-SENSITIVE 2010	NUTRITION-SENSITIVE 2012	NUTRITION-SENSITIVE 2013	NUTRITION-SENSITIVE 2014	NUTRITION-SENSITIVE 2015
Australia	49,903	114,553	NA	87,598	NA+++
Canada	80,179	90,171	NR	998,674	1,271,986
EU*	392,563	309,209	315,419	570,890	423,704
France**	23,003	27,141	33,599	NR	23,781
Germany	18,856	29,139	20,642	51,547	84,174
Ireland	34,806	45,412	48,326	56,154	54,217
Netherlands	2,484	20,160	21,616	18,274	28,422
Switzerland	21,099	28,800	29,160	26,501	43,656
UK***	302,215	412,737	734,700	780,500	928,300
US+	NR	1,857,716	2,206,759	2,619,923	2,555,332
Gates Foundation	12,320	34,860	43,500	29,200	42,000
CIFF	0	0	854	154	20,725
World Bank++	NA	NA	NA	NA	NA
13 donors total	937,428	2,969,898	3,454,575	5,239,415	5,476,297

DONOR	TOTAL 2010	TOTAL 2012	TOTAL 2013	TOTAL 2014	TOTAL 2015
Australia	56,575	131,069	NR	108,455	NA+++
Canada	179,025	295,634	NA	1,157,974	1,380,586
EU*	443,452	309,217	369,771	615,570	471,974
France*	25,898	30,993	36,205	NA	28,441
Germany	21,843	31,858	56,308	102,119	135,573
Ireland	42,497	52,977	59,102	75,308	67,295
Netherlands	5,145	24,167	41,832	43,299	60,027
Switzerland	21,099	28,800	29,160	26,501	43,656
UK*	342,075	475,864	839,700	867,500	1,020,700
US+	NR	2,087,069	2,517,865	2,883,163	2,938,223
Gates Foundation	62,380	115,470	127,034	90,900	138,500
CIFF	980	5,481	38,336	26,904	74,332
World Bank++	NA	NA	NA	NA	NA
13 donors total	1,200,969	3,588,599	4,115,313	5,997,693	6,359,307

Source: Authors, based on data provided by the donors.

Notes: Data is not in constant prices. Most donors report in US dollars, and where they do not, we use an annual average market exchange rate from the period reported on.[16] CIFF: Children's Investment Fund Foundation; Gates Foundation: Bill & Melinda Gates Foundation; NR: no response to our request for data; NA: not applicable (meaningful totals cannot be calculated owing to missing data or data produced using a methodology other than the SUN Donor Network's).

**At the Nutrition for Growth Summit, the EU committed €3.5 billion for nutrition interventions between 2014 and 2020. A commitment corresponds to a legally binding financial agreement between the EU and a partner. The disbursement figures reported by the EU are the total amounts of commitments contracted so far. Further disbursements of funds are made according to a schedule of disbursements outlined in individual contracts, progress in implementation and rate of use of the funds by the partner.*

***France reported US$4,660,013 as nutrition-specific disbursements, which can be rounded to US$4.7 million. The only difference between what France reported through the OECD DAC system and to the Global Nutrition Report is the SUN contribution which was counted as a nutrition-specific disbursement for Global Nutrition Report reporting.*

****UK figures represent nutrition disbursements from the Department for International Development only.*

+The US government's nutrition-sensitive component is calculated differently from that of other countries. For nutrition-specific, the US government uses the OECD DAC Creditor Reporting System (CRS) purpose code 12240, which includes activities implemented through the McGovern-Dole International Food for Education and Child Nutrition Program. It also includes the portion of 'emergency food aid' (CRS code 72040) and 'development food aid' (CRS code 52010) under the Title II Food for Peace Program that are identified as nutrition (programme element 3.1.9) in the US government's Foreign Assistance Framework. This programme element aims to reduce chronic malnutrition among children under 5 years of age. To achieve this goal, development partners focus on a preventive approach during the first 1,000 days – from a woman's pregnancy until the child is two. Programmes use a synergistic package of nutrition-specific and sensitive interventions that help decrease chronic and acute malnutrition by improving preventive and curative health services, including growth monitoring and promotion, WASH, immunisation, deworming, reproductive health and family planning, malaria prevention and treatment.

++The World Bank does not submit disbursements to the Global Nutrition Report and reports only on commitments through the Nutrition for Growth process.

+++While Australia made nutrition investments during the 2015 calendar year, these have not been calculated or reported for publication in the Global Nutrition Report. Australia reports to the Global Nutrition Report biennially.

Investments to address obesity and diet-related non-communicable diseases

Domestic spending on obesity and diet-related NCDs

Data on current levels of domestic financing for interventions, policies and programmes that prevent or treat overweight/obesity and diet-related NCDs, such as diabetes, cardiovascular disease and some cancers, is almost non-existent. This gap makes it impossible to assess the extent to which low, middle and high-income countries are or are not devoting the requisite resources to address these rising burdens. It is hoped that future changes to the World Health Organization (WHO) National Health Accounts Database will enable more readily available information about domestic spending in this area.

Various discussions are looking at how to address the lack of domestic financing for preventing all types of NCDs. At the Third International Conference on Financing for Development in July 2015, governments sent a clear message in the Addis Ababa Action Agenda that domestic resources will play a more important role in global health financing in the SDG era than in the Millennium Development Goal era.[17] Consequently, tobacco taxation was elevated as a win-win solution. The success of tobacco taxation has prompted recommendations for tax on other unnecessary and unhealthy products, including sugary drinks. Governments around the world are beginning to recognise the dual benefit of such fiscal policies as successful ways to generate revenue.[18]

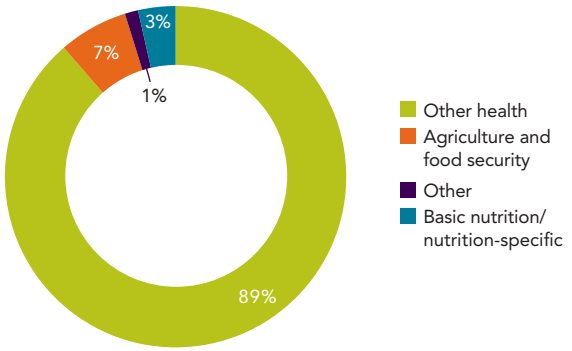
International spending on obesity and diet-related NCDs

The focus on domestic spending is not to undervalue international spending. As reported in the *Global Nutrition Report 2016*, there is no CRS code to track ODA to obesity or NCDs. As discussed in Spotlight 4.2, there are proposals to introduce one. In the meantime, to estimate donor ODA spending on obesity and diet-related NCDs, the entire OECD DAC CRS dataset was searched to identify activities relating to the prevention or treatment of obesity and diet-related NCDs among all purpose codes. First the title and description fields of each record in the CRS dataset were searched for one or more keywords: diet, diets, obesity, NCD, non-communicable disease, chronic disease, diabetes, obésité, maladies non transmissibles, maladie chronique, diabète. Among the 226,221 records contained in the 2015 CRS dataset, 480 contained one or more keywords. These were then reviewed individually to discard any irrelevant projects. Projects were deemed irrelevant when the information in their title and descriptions clearly indicated the project did not concern obesity or diet-related NCDs. Projects that appeared primarily to target agriculture or undernutrition, and anti-tobacco and sports-based interventions, were also excluded.

Among the CRS records for 2015, 101 projects appeared to focus on tackling obesity and diet-related NCDs based on the information in their titles and descriptions. ODA disbursements to these activities total US$25.3 million, and commitments total US$24.5 million. This amount represents a dismal 0.01% of global ODA spending (to all sectors) in 2015.

Based on this search, disbursements appear to have almost halved from the US$49.1 million captured in 2014 to US$25.3 million in 2015. Why there has been a downturn in funding is unclear. Accounting for 51% of the funding, the UK and Australia disbursed the most, US$7.2 million and US$5.7 million respectively. Spending was directed to at least 36 countries, with US$5.5 million allocated at a regional level and US$2.4 million with no single specified recipient. The largest country recipients were China and Fiji, receiving US$5.6 million and US$4.0 million respectively. Of spending on obesity/diet-related NCDs, 92% (or US$23.3 million) was reported as health sector spending (purpose code 120). Of this 92%, 3% (or US$0.9 million) was reported under the basic nutrition purpose code (12240). The agriculture and food security sector accounted for another 7% of the obesity/diet-related NCD-relevant spending, with the remaining 1% spread across other sectors (Figure 4.12).

FIGURE 4.12: ODA spending on diet-related NCDs by sector, 2015



Source: Development Initiatives based on OECD DAC Creditor Reporting System.

Notes: Amounts based on gross ODA disbursements in 2015. 'Other' includes infrastructure, governance and security and humanitarian interventions.

This reflects low development assistance for all NCDs overall.[19] According to the Institute for Health Metrics and Evaluation's 2016 *Financing Global Health* report, of the total US$37.6 billion in development assistance for health in 2016, only 1.7% went to NCDs and mental health, compared with almost 30% to maternal and child health and 25% to HIV and AIDS. This does not match the global burden of disease.[20] From 2010 to 2016, while funding for NCDs increased 5.2% on an annualised basis, it remained the health area with the least funding by far. The report also shows that the largest proportion of development assistance for NCDs between 2000 and 2016 came from private philanthropy, with the most significant proportions for tobacco programmes and health services. Despite the overall neglect of development assistance for obesity and diet-related NCDs, two private foundations are investing in obesity and diet-related NCD prevention, building on their experience of funding tobacco cessation promotion (Spotlight 4.3).[21]

SPOTLIGHT 4.3 INVESTING IN OBESITY AND NCD PREVENTION: BLOOMBERG PHILANTHROPIES AND INTERNATIONAL DEVELOPMENT RESEARCH CANADA

Neena Prasad and Greg Hallen

Bloomberg Philanthropies

Neena Prasad

Since 2012, Bloomberg Philanthropies has committed over US$130 million to support cities and countries around the world to enact and evaluate policies that aim to curb rising rates of obesity.[22] As a private foundation, it is well placed to test evidence-informed policy innovations, where cash-strapped governments might be reluctant to do so.

Our obesity prevention programme mirrors that of our largest public health programme – the Bloomberg Initiative to Reduce Tobacco Use – which, from a policy perspective, has important parallels with obesity prevention. As a foundation with preventing NCDs at the core of our public health programming, the large and rising burden of obesity compelled us into action. The programme has two components:

- The first component funds actions designed to drive the implementation of public policies. It is based on evidence that the basic cause of obesity is an 'obesogenic' environment (that is, one that heightens people's obesity risk through their surroundings, opportunities or conditions of life). There is thus a scientific rationale to fund the testing of public policies to ensure healthy foods and drinks are more accessible, affordable and appealing relative to unhealthy ones in the food environment.
- The second component funds rigorous evaluation of these public policies to build the empirical evidence for action – to identify what works, where and how. It is hoped that the generation of this evidence will be the basis for a policy package that any country or jurisdiction can adopt.

The priority policies for the programme are:

- Limiting children's and adolescents' exposure to unhealthy foods and beverage marketing through comprehensive marketing bans
- Taxing sugary beverages and junk foods
- Removing unhealthy products from public sector institutions, especially schools
- Using simple and informative front-of-package nutrition labels.

The first step in developing the programme was funding a pilot launched in Mexico in 2012. This funded Mexican NGOs to campaign for public policies, and the Mexican National Institute of Public Health to support evaluation of enacted policies. The subsequent vigorous campaign by these NGOs culminated in a one-peso-per-litre tax on sugary drinks (implemented in January 2014) which evaluations have found is effective in decreasing purchases of these drinks.[23]

The early success in Mexico encouraged us to expand the programme to other places with a high burden of obesity (and related NCDs) and momentum among governments and civil society to act. Additional focus countries are Barbados, Brazil, Colombia, Jamaica, South Africa and the US. Meanwhile, Chilean research institutions are receiving funds from our Evaluation Fund to measure the effects of recent innovations around package labelling and marketing restrictions of junk food.

International Development Research Centre

Greg Hallen

Canada's International Development Research Centre (IDRC), a key part of Canada's foreign policy programming, supports knowledge, innovation and solutions to improve lives in developing countries. IDRC has also taken a leading stance in supporting research into NCD prevention. This includes focusing on food systems interventions, and IDRC has funded over CAD$17 million since 2012 in at least 30 projects in low and middle-income countries.

Our funding for diet-related NCD prevention, made through our Food, Environment and Health programme, was established following the call for more financing at the 2011 High-Level Meeting on NCDs, and in response to the growing evidence that NCDs are a huge and growing burden for developing countries yet not an inevitable outcome of economic development. IDRC was well placed to take a leadership role in this area, given its 20 years' experience supporting multidisciplinary, multisectoral research on tobacco control and the environmental causes of neglected, emerging threats to health.

Through our programming, we aim to stem the rising tide of diet-related NCDs in several ways: by shifting local food systems and dietary trends towards healthier, more nutritious and diverse diets; by identifying and assessing innovations in food systems and public policies to improve access to, as well as affordability and appeal of, healthy diets; and by reducing consumption of diets high in fat, sugar and salt.

All projects are country led and focus on empowering local researchers to generate locally-owned solutions. We follow the principle that local, low-cost solutions are best enabled through locally-owned evidence. Funded projects to advance fiscal policy and community-based solutions to NCDs cover a range of approaches and global hotspots across Latin America, the Caribbean, Asia and South Africa.

For example:

- In South Africa, policy researchers partnered with decision-makers to reduce salt intake, leading to new legislation in 2013. Building on that success, IDRC-funded research helped introduce new taxes (announced for 2017) on sugar-sweetened drinks.
- In Peru, researchers demonstrated the impact of TV exposure of unhealthy food advertisements towards children, leading to a new law to reduce food advertisements targeting adolescents. They have also shown that increasing fruit and vegetable content while reducing use of salt and saturated fat is feasible in community kitchen-provided lunches that serve over 500,000 meals a day to people with low incomes.
- Further projects to improve public and private sector food policies are being funded in Argentina, Brazil, Chile, Guatemala, Malaysia, Mexico, Thailand and Viet Nam.
- Of global relevance, a casebook is being developed on the ethical challenges of interactions between public and private actors working towards improved nutrition and NCD prevention. This is in partnership with the Canadian Institutes of Health Research and the UK Health Forum.

IDRC and Bloomberg Philanthropies cooperate in our efforts to address obesity, whether bolstering evidence-based research or rallying academic leadership behind their policy efforts with civil society actors. But their joint challenge is to articulate how, for an audience of regional policymakers and potential global partners, a focus on population-level interventions or policies is as central to saving lives as are community-level interventions. Prevention requires special attention to address the growing burden posed by poor diets – exactly the kind of experience and focus international funders can offer in encouraging domestic efforts to improve nutrition.

Given the overall lack of funding for NCDs, there have been proposals for further forms of innovative financing.[24] One is private mechanisms such as grants and technical assistance which entail private-to-private aid flows, usually through civil society. Another is *solidarity or crowd-funding mechanisms*, which collect decentralised funds from private sources to enable private-to-sovereign transfers of resources. *Catalytic mechanisms* provide public guarantees to mobilise private capital towards a socially-beneficial purpose and *blended finance mechanisms* encompass a broad range of models that mobilise finance from multiple sources under the auspices of a trusted public authority.

An investment framework for NCDs, akin to the Investment Framework for Nutrition, is also in development, led by WHO and supported by Bloomberg Philanthropies. The framework would provide governments and donors with the estimated costs of investing in proven interventions. The aim is to provide a robust case to incentivise and guide investment by governments, donors and businesses, including a prioritised set of policies and interventions for countries at different stages of development.

Conclusion: Getting serious about funding

We need to consider funding flows for nutrition in a much more universal way. Governments and donors need to ramp up funding for nutrition-specific interventions if we are to address the MIYCN targets for stunting, wasting, anaemia and exclusive breastfeeding. Funding for the prevention and treatment of obesity and diet-related NCDs is disturbingly low and does not reflect the rising burden. Spending on nutrition is split into that for undernutrition on one side, and diet-related NCDs and obesity on the other. There needs to be further exploration of how these investments could be used to tackle the multiple burdens of malnutrition through 'double duty' investments. One way to start would be to at least ensure that both nutrition and NCD donor aid is tracked in a more accurate and integrated manner.

There is also considerable room for improvements in the way nutrition-sensitive funding is tracked. The fact that investments in sectors such as social protection, health, agriculture and education is significant is promising for a more integrated agenda for nutrition and the SDGs. To move this agenda forward we need to better track the effect this 'nutrition-sensitive spending' has on nutrition and other goals across the SDGs.

An additional gap is the lack of information about the impact on nutrition of the development flows made for reasons that have nothing to do with nutrition. According to the OECD, these flows make up more than 70% of all financing for development (with ODA making up less than 30%), and include finance provided by public bodies at close to market terms or with a commercial motive; private finance at market terms, such as foreign direct investment;[25] and blended capital approaches that offer grant funding alongside investment capital. More research is needed to understand the impact of this financing on nutrition.

The gap in global investment to nutrition is massive – a rounding error in the flows of money towards sustainable development. Filling it will be a formidable challenge. Some of it will be plugged by more ODA and domestic funding for nutrition-specific interventions. The data presented in this chapter suggests we will have to wait for too long if we focus only on this approach. The SDGs provide an opportunity to think differently. Their more integrated approach demands looking to more innovative financing mechanisms and leveraging other investment flows for multiple wins in multiple sectors. An integrated view of investment across the SDGs will be crucial if we are to deliver universal outcomes for nutrition.

5 Nutrition commitments for transformative change: Reflections on the Nutrition for Growth process

Key findings

1. Of the 203 commitments made at the Nutrition for Growth (N4G) Summit in 2013, 36% are either on track (n=58) or have already been achieved (n=16). UN agencies, non-governmental organisations (NGOs) (with their policy commitments) and donors (with their financial commitments) are progressing particularly well.
2. Many of the N4G stakeholders (49%) have not reported on progress on their N4G commitments this year, well below the 90% target response rate set by the *Global Nutrition Report 2016*. Donors and UN agencies continued to have the highest response rates. Over the four years of reporting progress to the Global Nutrition Report, businesses have consistently had the lowest response rate. Suggestions to improve response rates include sticking to annual reporting cycles.
3. Lessons learned from the N4G process include that securing SMART (specific, measurable, achievable, relevant and time-bound) commitments is a challenge, the 'R' for relevance is important but often ignored, there are disincentives to make ambitious commitments, and voluntary commitments must be designed carefully if they are to be an effective accountability mechanism.
4. Evidence from research, as well as the N4G process, shows that there are differing levels of political commitment. 'Rhetorical' commitments made at global events will not lead to change unless they become embedded politically through system-wide commitment at the country or local level.
5. The Decade of Action on Nutrition 2016–2025 and the SDG agenda provide excellent opportunities to ensure that future commitments for nutrition are SMART, integrated into other development platforms, aim to have 'double duty' and triple duty' outcomes, and have universal reach.

In this chapter, we track progress against the 203 commitments made by 110 signatories at the N4G Summit in 2013. This year, considering the universal and integrated vision of the SDGs, and the promise of the Decade of Action on Nutrition as an umbrella for new commitments, we also ask what we have learned from N4G about how to make commitments align with a more transformative agenda, and what will be needed to make these changes.

Monitoring progress on the N4G commitments

The N4G process

The N4G Summit, held in London in 2013, brought together diverse stakeholders to commit to reducing the burden of malnutrition. Signatories committed by 2020 to ensure that effective nutrition interventions reach at least 500 million pregnant women and children under two; to reduce stunting of children under five by 20 million; and to save the lives of at least 1.7 million children under five by preventing stunting, increasing breastfeeding and increasing treatment of severe acute malnutrition.

The different groups of signatories made different types of N4G commitments with financial commitments totalling US$23 billion.[1] Donors made financial and non-financial commitments. NGOs made policy and financial commitments. Businesses made commitments related to their own workforce, as well as wider non-workforce commitments. Countries made four types of commitments:[2]

- 'impact commitments' on improving nutritional status
- 'financial commitments' on the sources and amounts of funding to nutrition
- 'policy commitments' on policies to create a more enabling environment for nutrition action
- 'programme commitments' on specific programmes to improve nutritional status.

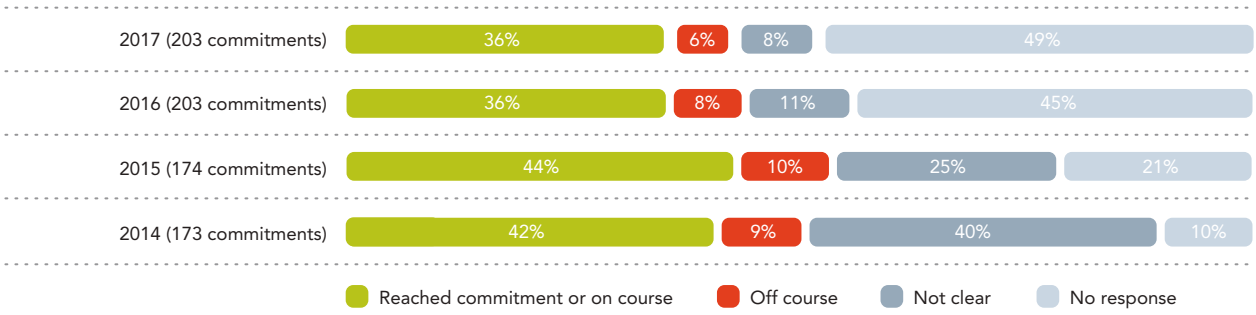
For each year that the Global Nutrition Report is published, N4G signatories' progress is assessed against their original 2013 commitments using the following categories: 'reached commitment', 'on course', 'off course', and 'not clear'. At least three independent reviewers made assessments before a final consensus was reached.

Overall progress and achievements

For this year's report, 36% of stakeholders have attained or are on course to meet the commitments made in 2013 (Figure 5.1), the same proportion as reported in the *Global Nutrition Report 2016*.[3] The commitments most likely to be classified as 'on course' are the UN agencies' at 86% (n=7), followed by other organisations' at 75% (n=4) and the NGO policy commitments at 73% (n=11) (Figure 5.2). Commitments 'met' or that are 'on course' include a wide variety of achievements. For example, the International Fund for Agricultural Development (IFAD) surpassed its commitment of introducing specific nutrition-sensitive designs in around 20% of all new IFAD-funded projects. In 2016, IFAD introduced nutrition-sensitive designs in 46% of new projects. InterAction exceeded its financial commitment to 2020 of US$300 million on nutrition-specific programmes and US$450 million to nutrition-sensitive programmes. The story of how Unilever met its workforce commitment is told in Spotlight 5.1. For a complete list of progress across each signatory and detailed assessments of progress, please see the tracking tables for each stakeholder on the Global Nutrition Report website.[4]

Progress towards the N4G financial commitment by donors has been relatively strong this year, with 70% of commitments having been reached or 'on course' to be reached in 2017.[5] During the 2013 N4G summit, donors committed US$19.9 billion, and they have met 90% of that commitment – US$17.9 billion – since reporting on N4G began in the 2014 report (Figure 5.3).[6]

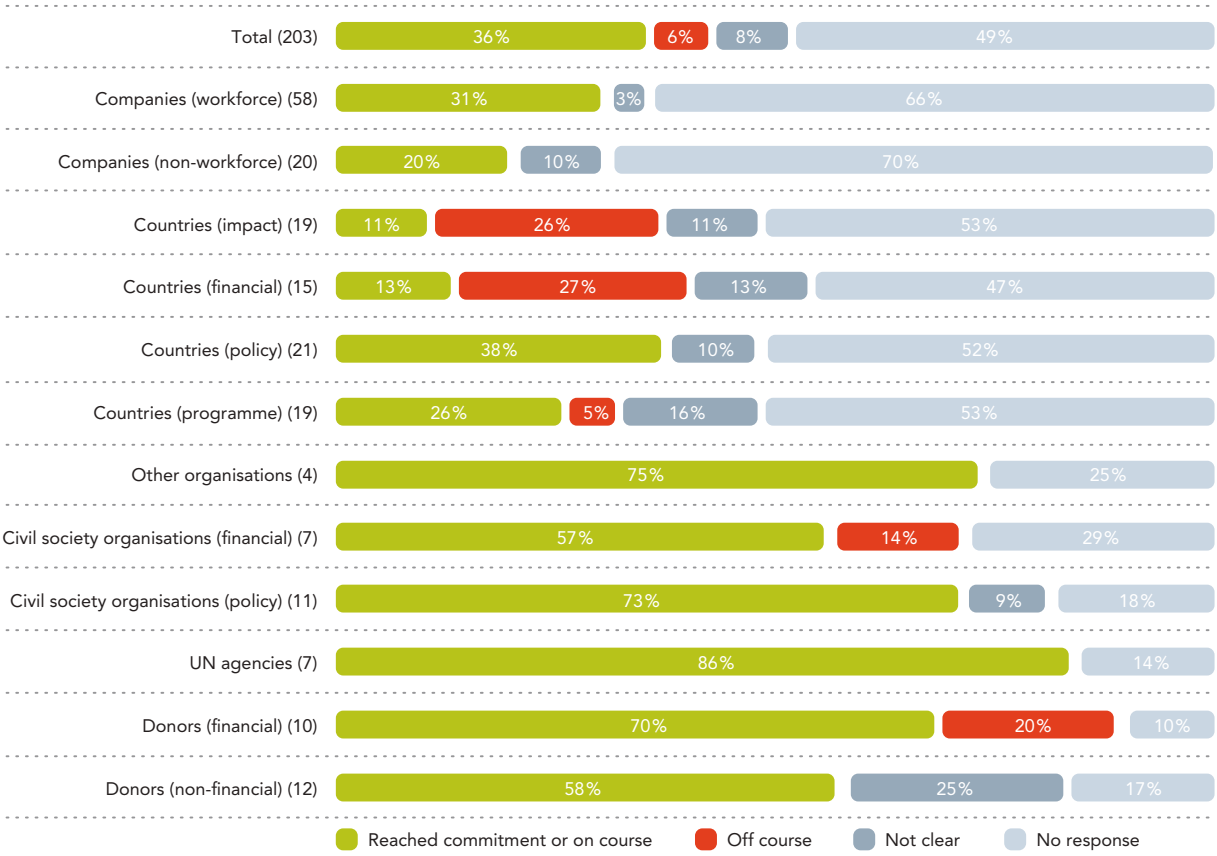
FIGURE 5.1: Overall progress against N4G commitments, 2014–2017



Source: Authors.

Notes: In 2013, 204 commitments were made, but the Global Nutrition Report 2014 included only 173 because businesses were not ready to report on all their commitments. There were 174 commitments in 2015 and 173 in 2014 because Ethiopia did not separate its N4G commitment into programme and policy components in its 2014 reporting, but did in 2015. The total for 2016 (203) includes all commitments made; this differs from the 2013 total because the Naandi Foundation was taken out of the reporting process. N4G: Nutrition for Growth.

FIGURE 5.2: Progress against N4G commitments by signatory group, 2017



Source: Authors.

Notes: N4G: Nutrition for Growth.

Details of progress by signatory group

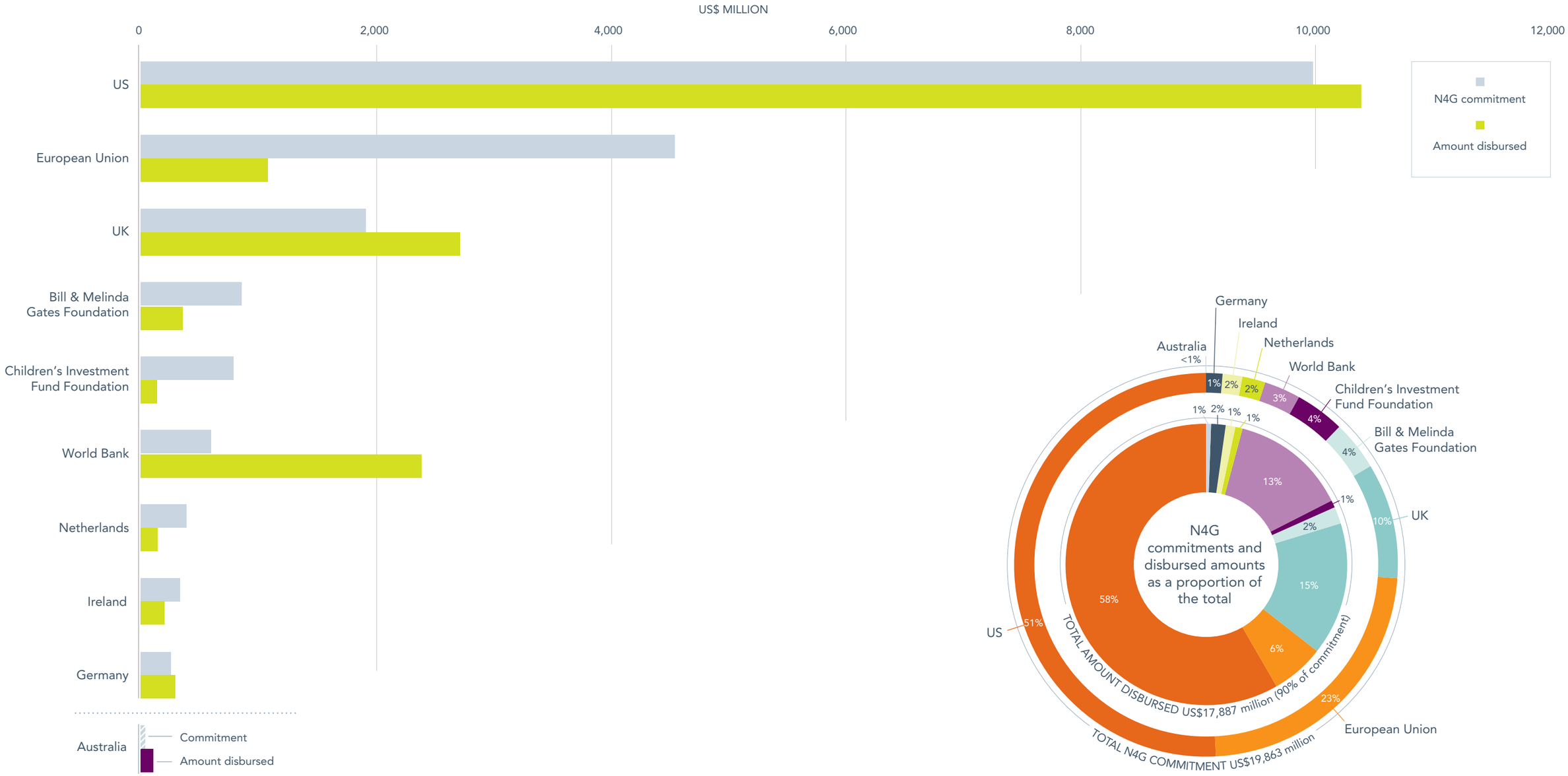
- **Country governments:** Less than 50% of countries responded. For the nineteen impact commitments, two governments are assessed as on course and five governments are off course. One government (Senegal) has achieved its financial commitment and four are assessed as off course. For policy commitments, two governments (Bangladesh and Burkina Faso) have reached their commitment and six are on course. Five governments are on course for their programme commitments.
- **Donors:** There are twelve non-financial commitments from donors; two donors have reached their commitment (Australia and the World Bank) and five are on course. Two donors (Germany and World Bank) have achieved their financial commitments and five are on course; the remaining donors are off course (two) or did not respond (one).
- **Civil society organisations:** Of the eleven policy commitments, two NGOs (Action against Hunger and Micronutrient Initiative, now Nutrition International) have achieved their commitments and six are on course. There are seven financial commitments from NGOs, three have been reached (Comic Relief, Concern Worldwide and Interaction), one is on course and one is off course.
- **Businesses:** Companies' response rates were 30% for non-workforce commitments and 34% for workforce commitments. Of the twenty non-workforce commitments, two have been achieved (Cargill and Unilever), two are on course and two are not clear. Of the 58 workforce commitments, 18 companies self-reported as on course and 2 as not clear. Unilever explains how it reached its commitment in a case study in Spotlight 5.1.
- **UN agencies:** Of the seven UN agency commitments, two have reached their commitments (IFAD and the UN Network for Scaling Up Nutrition (SUN)) and four are on course.
- **Other organisations:** There are four commitments from other organisations; three (CABI, Global Alliance for Improved Nutrition and Grand Challenges Canada) are assessed as on course.

Overall shortfalls of the N4G process

While progress in meeting N4G commitments has been made, it has been slow and response rates have fallen steadily. In terms of speed of progress, only 16 of 203 commitments were assessed as 'achieved' between 2013 and 2016, with another 58 assessed as 'on course'. This means 110 stakeholders have until 2020 to achieve 187 of the commitments – most of which are either not reported on, off course, or unclear. There is thus still a lot of work to do across policies and programmes to achieve these commitments. It is notable that the largest proportion of off-course commitments were made by national governments (Figure 5.2).

In terms of lack of reporting, the *Global Nutrition Report 2016* included a call to action that, "The *Global Nutrition Report 2017* should be able to report a better than 90% response rate". Figure 5.4 shows that this year, the response rate of 51% is well below that target. Donors and UN agencies have the highest response rate, as they did in the *Global Nutrition Report 2016*. Low response rates may indicate a perceived lack of benefit or incentive to report on N4G commitments. Previous Global Nutrition Reports considered possible reasons for decreasing response rates, including: reporting fatigue, the shifting time frame of the Global Nutrition Report, a short reporting schedule and high staff turnover particularly in governments and NGOs. Over the four years of reporting progress to the Global Nutrition Report, businesses consistently had the lowest response rate. This year, only 30% of companies reported on their non-workforce commitments and 34% of companies reported on their workforce commitments. It should be noted that companies have the largest number of stakeholders in the 2017 report, with 38 companies reporting on N4G commitments (compared with 7 UN agencies). In Spotlight 5.2, the SUN Business Network proposes some ideas of how businesses can better hold themselves accountable to their commitments.

FIGURE 5.3: Donor total N4G commitments (in most cases 2013–2020) and disbursements (in most cases 2013–2015)



Source: Authors; Nutrition for Growth (N4G) commitments.[7]

Notes: Data for Australia is in Australian dollars. Converted to US dollars using 2013 exchange rate from the Internal Revenue Service (US).[8] *Amount disbursed is only for 2014 (as Australia only reports to the GNR every other year). N4G commitment covers 2014–2017. For the US the N4G commitment covers 2012–2014 but disbursements include 2012-2015. The World Bank uses the term 'reported as covering' rather than amount 'disbursed'. For the World Bank the N4G commitment covers 2013–2014 but the disbursements/amount reported cover 2013–2015. The inner ring of the donut chart on the right shows the percentage spent by each donor as a proportion of the total disbursed, and the outer ring shows the percentage committed by each donor as a proportion of the total commitment.*

SPOTLIGHT 5.1 UNILEVER'S COMMITMENT TO ITS GLOBAL WORKFORCE

Angelika de Bree and Kerrita McClaughlyn

'Lamplighter' is Unilever's global healthy workforce programme for assessing and improving four modifiable risk factors: **physical health, exercise, nutrition and mental resilience**. Lamplighter provides structure and guidance on how to develop strategic initiatives around physical and mental health so that each country business can support its workforce in the most locally appropriate way. This includes providing guidance on managing long-term health conditions, diabetes or HIV. It is delivered as part of Unilever's global Well-being Framework.

At the 2013 N4G summit, Unilever made a workforce commitment to lead by example by pledging to improve nutrition and consequently productivity and health across the company's workforce. By June 2016, Unilever pledged to:

1. Introduce a nutrition policy for a productive and healthy workforce
2. Improve policies for maternal health including support for breastfeeding mothers.

Goals of the Lamplighter programme

- Ensure that Lamplighter is in place in all countries with 100 or more employees, which Unilever aims to achieve by 2020.
- Address the local health risks and establish local and national health improvement plans – in partnership with occupational health, human resources and supply chain teams to make sure the right health benefits are delivered in the way that works best for each country.

Unilever encourages employees to be empowered to manage their own health and provides support and resources to build "sustainable, healthy performance habits". A key way to reinforce this message is through Lamplighter health checks and the global well-being workshop 'Thrive', which introduces employees to the Well-being Framework. The global health check assessments allow colleagues to better understand their health risk measures, such as blood pressure, body mass, diabetic and cardiovascular risk, and how their lifestyle may impact on their health. In 2016, Unilever delivered over 80,000 health checks globally, in almost 100 locations. Employee nutrition is another main component of the global Lamplighter programme. As part of this, all Unilever-run cafeterias/canteens adhere to Unilever global nutritional guidelines, outlined in the Unilever Balanced Meal Criteria.

Impact for Unilever

Programmes such as Lamplighter have important short and long-term health and business benefits. In the short term, Unilever expects to see healthier, more motivated and more productive employees, with lower rates of sick leave. The long-term benefits are achieving good health and longevity, happiness and purpose for Unilever colleagues and a sustainable workforce with reduced healthcare costs for the business (which also reduces the burden on public healthcare).

Unilever has commissioned multi-year studies in various countries to evaluate the return on investment of its health programmes. The global results range up to >€1:€2.57, proving a positive impact of Unilever's health and well-being programme. These findings are measured as part of Unilever's health risk factors review over a three-to-five-year period and suggest that the Lamplighter health checks have shown a significant improvement in the associated disease prevalence of hypercholesterolemia, hypertension and number of smokers in the organisation. Unilever also reviews the frequency of work-related illness per million man-hours worked and the performance of its health service suppliers.

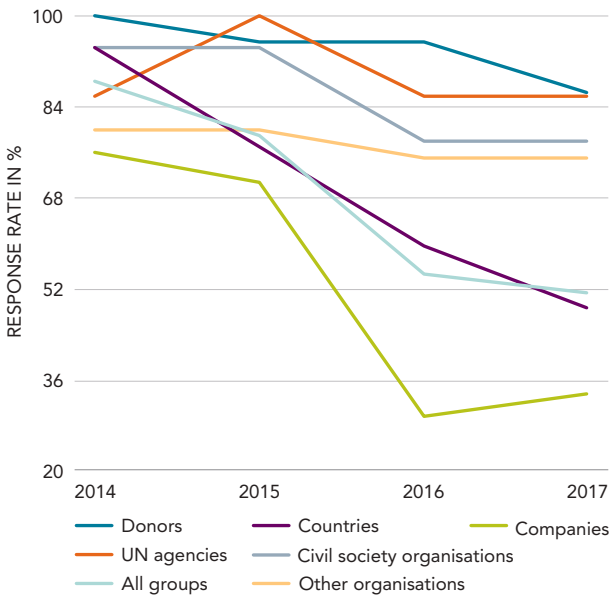
SPOTLIGHT 5.2 ACCOUNTABILITY, BUSINESS AND NUTRITION

Jonathan Tench

Ensuring businesses hold themselves accountable for their commitments is a challenge not only for the Global Nutrition Report but also for the plethora of accountability mechanisms springing from the SDGs. Here are some suggestions for how to keep businesses engaged.

1. **Use annual cycles:** Multinationals stick to quarterly and annual reporting cycles for shareholders, and now, increasingly, for sustainability initiatives. Tracking for the Financial Times Stock Exchange (FTSE) Sustainability Index is a year-round process which allows companies to sync tracking and improve the quality of data and analytics.
2. **Give recognition:** Companies participate in external accountability mechanisms to attract new partners and investors and keep shareholders and stakeholders happy. For examples, companies in the Access to Nutrition Index (ATNI) – a global initiative that evaluates the world's largest food and beverage manufacturers on their policies, practices and performance related to undernutrition and obesity – strive every year to beat their previous score and, more importantly, their rivals. Highlighting success stories – ensuring companies compete for the limelight – as well as helping businesses understand why they are not making progress are ways of encouraging a race to the top.
3. **Incorporate new companies and new commitments:** If accountability mechanisms only report on commitments made in the past they fail to consider more recent commitments. For example, since the 2013 N4G summit, over 350 companies have made commitments by signing up to the Scaling Up Nutrition (SUN) Business Network. Businesses would value being recognised for these new commitments as well as older ones.
4. **Avoid duplication:** Multinational companies can offer their nutrition commitments to a multitude of mechanisms: the UN Global Compact, the UN's Every Woman Every Child platform, the SUN Business Network, the World Food Programme's Zero Hunger initiative, to name a few. If nutrition commitments could be brought into one mechanism they would be held accountable to, and feel the heat from, the widest possible audience.
5. **Develop reporting frameworks as part of the SDGs:** Today, companies are directly linking their corporate social responsibility and sustainability commitments to the SDGs. Integrating reporting of the SDG nutrition targets, 2.2 and 3.4, into an SDG reporting framework would make it more efficient for business.

FIGURE 5.4: Response rates by signatory group, 2014–2017



Source: Authors.

Reflecting on the nature of commitments

We can see from N4G 2014–2017 data that voluntary reporting and compliance are key challenges for accountability. While the reasons for this need to be subject to further research, we have drawn on our experiences with N4G commitments to identify four key lessons for voluntary commitment-making processes:

1. Securing SMART commitments is difficult.

The *Global Nutrition Report 2015* found that only 29% of 2013 N4G commitments are SMART – specific, measurable, achievable, relevant and time-bound. Interestingly, evaluations of another commitment-making process, the EU Platform on Diet, Physical Activity and Health, also noted that only 13% of the 116 commitments were SMART.[9] Without SMART commitments, it is challenging to measure progress and there is a risk that any repository set up for such commitments will not be able to track effectively. *The Global Nutrition Report 2016* highlighted that commitments must be SMART to be trackable. Alongside the report, a guidance note was developed, *Making SMART Commitments to Nutrition Action*,[10] to support creating SMART commitments.

> Specifically, we call on governments to make SMART Commitments to Action to achieve national nutrition targets and to put in place monitoring systems that allow them and others to assess progress. We also call on all actors — governments, international agencies, bilateral agencies, civil society organisations and businesses — to revise or extend SMART and ambitious commitments as part of the 2016 N4G Rio Summit process. Actors in other sectors should also specify in a SMART manner how commitments in their own sectors can help advance nutrition.
>
> ***Global Nutrition Report 2016***[11]

2. Relevance is important but often ignored.

Relevance (the 'R' in SMART) is essential for ensuring that commitments measure something meaningful: that is, they contribute to national plans, are linked to global or regional targets, or relevant to the problem at hand. For example, a commitment made to buy locally to improve producer incomes and improve diets would only be relevant if the foods provided improved the quality of diets.[12] Relevant commitments are particularly important for civil society and business stakeholders to make certain that government, global or regional priorities align. And also to enable stakeholders and advocates to track trends, adjust their course appropriately or hold others to account. In the case of businesses, commitments must tie to their core business models and commercial incentives. Yet analysis of N4G targets in the *Global Nutrition Report 2016* indicated that N4G commitments do not sufficiently consider relevance. For example, they do not specify which types of malnutrition they seek to address. Where they do, commitments do not focus on overweight, obesity and NCDs – a missed opportunity given rising burdens. Similarly, an evaluation of the EU Platform for Diet, Physical Activity and Health, found that only 11% of commitments implemented in 2015 made an explicit link to wider EU policy priorities, and links to World Health Organization priorities were implicit rather than explicit.[13]

3. There are disincentives to make ambitious commitments

Assessing commitments as 'on course' or 'off course' may unintentionally incentivise commitments that can be easily met (the 'A' in SMART). In contrast, tracking may fail to recognise progress on ambitious commitments. The *Global Nutrition Report 2014*'s assessment of Concern Worldwide's progress on its N4G commitment was found to be 'off course', for example, though we recognised its impressive progress against an ambitious target. The same can be said for Save the Children – ambitious, brave commitments that set the bar high for the organisation. Further work is needed to determine how best to incentivise ambitious commitments, without penalising stakeholders who make significant progress. This is particularly important as stakeholders address ambitious global nutrition targets (such as zero malnutrition by 2030).

4. Voluntary commitment-making processes have faced challenges.

The N4G process, SUN Business Network and EU Platform on Diet, Physical Activity and Health include more than 600 voluntary nutrition or diet-related commitments from business; this increase in the number of commitments is a promising trend. However, voluntary commitments made through these processes have typically not been SMART. Experience of these processes also show that having a large number of diverse commitments makes it hard to track them against common categories, criteria or targets. This in turn makes it hard to spot trends and gaps, and to understand potential barriers and enablers to action on nutrition by businesses, NGOs and other actors.[14] Likewise, there are issues around voluntary reporting. To be robust, evidence indicates reporting should be independently verified. Yet at present, most reporting mechanisms do not verify the information that is reported to them. One exception is the Access to Nutrition Index (ATNI) – featured in the *Global Nutrition Report 2015* and *2016* and Spotlight 5.2 – which measures businesses according to set criteria based on inputs from a wide range of stakeholders and also verifies independent reporting from businesses.[15]

From commit*ments* to meaningful commit*ment*

With the SDG agenda and the Decade of Action on Nutrition, there are and will continue to be calls for new commitments (financial, programmatic and political) to reach set targets and to support that reach. Commitments have already begun to be made as part of the Decade of Action on Nutrition. To enable these commitments to be meaningful – SMART, implemented and having impact – it is instructive to look at the meaning of 'commitment' from a political perspective. Researchers who study political commitments have found that for commitments to be meaningful they need to go beyond the 'rhetorical' – which voluntary commitments made at global forums can be – to become integrated, system-wide commitment. Separating these 'levels' of commitments (see Spotlight 5.3) provides a better understanding of the depth of commitment and how to measure it. Overall, it has important implications for what type of commitment is needed to convert the Decade of Action into a 'Decade of Transformative Impact'.

SPOTLIGHT 5.3 FIVE DIFFERENT LEVELS OF POLITICAL COMMITMENT

Phillip Baker

Level 1: Rhetorical commitment – spoken but not always acted on.

Many of the N4G commitments are an example of what can be termed 'rhetorical' commitments. That is, statements made by nutrition stakeholders recognising that malnutrition is a serious problem and action is needed, but not always followed up by SMART action.[16] Such 'statements of intent' can be converted into substantive action; but they can also be short-lived and tenuous. This is more likely when the political costs of inaction are low (such as when civil society pressure or citizen demand is weak) or when opposition is high (such as when powerful interest groups stand to lose).[17] In short, rhetorical commitment can be 'symbolic' unless backed-up by action.

Level 2: Institutional commitment – converting rhetorical commitment into substantive policy infrastructure.

'Institutional commitment' includes establishing government institutions able to effectively coordinate multi-sector and multi-level responses to malnutrition, as well as having the right laws, policies, data systems and plans in place.[18] It requires the commitment of mid-level civil servants and managers responsible for coordinating responses. When well designed, political leaders and bureaucracies can be held accountable to their adopted policies. Empowered institutions can advocate for ongoing attention and resources.[19] Such commitment can be tenuous, however, when institutions and policies are 'tokenistic' only. That is, they appear to act without doing so.

Level 3: Implementation commitment – converting rhetorical and institutional commitment into on-the-ground action and results.

For 'implementation commitment' to happen, the right human, technical and financial resources must be in place for a sustained period of time at national *and* subnational levels, so must mechanisms for incentivising action (such as performance-based financing). It also needs the commitment of the people managing programmes on the ground.[20] Strong implementation commitment, when combined with the right data systems and monitoring, can increase the likelihood of policy success. This in turn reinforces the other forms of commitment, and increases ownership of the issue among policymakers and citizens.[21] In short, success leads to commitment which leads to success.

Level 4: Systems-level commitment – achieving level 1–3 commitments, sustained and adjusted over time.

'Systems-level commitments' come from all actors in a nutrition system including, ultimately, the communities, families and individual citizens who benefit from policy actions.[22] To be truly effective, building commitments must be more than a one-off process. Stakeholders must sustain and recalibrate their commitment in response to opposition, changing conditions and implementation challenges until malnutrition is reduced.[23] Once achieved, systems-level commitments can generate a powerful reinforcing feedback loop that institutionalises effective nutrition policy responses over time.

Level 5: Embedded, integrated commitment – when commitments in other sectors indirectly related to nutrition achieve positive nutrition outcomes (such as economic development and poverty reduction).

'Embedded, integrated commitments' achieve 'nutrition success without nutrition-specific commitment'.[24] Sustained integrated commitment can create opportunities for nutrition policymakers and advocates, for example when they are able to sensitise broader policy agendas and position nutrition within them.[25] This type of embedded commitment is fundamental if we are to achieve multiple goals through shared agendas for the SDGs, as discussed in Chapter 3.

Conclusion: Making commitments meaningful

We learned in the *Global Nutrition Report 2016* that commitments need to be SMART – and that obtaining SMART commitments is a challenge. Here we also highlight the importance of the 'R' for relevance: commitments must be relevant to the problem, and relevant to the stakeholder. The accountability process must also work to incentivise engagement: low response rates suggest something is not working, as does inadequate progress.

There are also lessons to be learned from the data in this chapter – and the evidence presented in Chapters 2 to 4 – about how to make commitments to nutrition more meaningful in the SDG era. First, **integrate nutrition into commitments made within other areas of development.** These include transport infrastructure, food systems, water and sanitation, education and urban planning – areas identified as critical in Chapter 3. This could mean integrating nutrition into mechanisms such as the UN Global Compact or the UN Framework Convention on Climate Change process. It could mean linking into other communities, such as the Global Partnership for Education, Every Woman Every Child, and Sanitation and Water for All. Second, **commit to achieve multiple goals.** At the most basic level, commit to double duty interventions, programmes and policies, or better still, triple duty so that nutrition is enabling other development goals to be met, too. Chapter 3 (Boxes 3.3 and 3.4) indicates what such commitments could look like. Third, **commit fully to universality.** Nutrition is both a result and a driver of inequality. To truly tackle this, we must commit to including targets and indictors in our plans, programmes and data systems which cover subnational, intra-community and intra-household populations. The commitments should also target all vulnerable populations and all forms of malnutrition including overweight, obesity and NCDs as well as stunting and wasting. Fourth, **make your commitments extend beyond rhetoric.** Commitments should be part of a deeper process of committing to nutrition. Commitments made to global processes such as N4G, the Decade of Action on Nutrition and the SDGs are important but not enough. Countries, NGOs, the private sector, UN agencies, the research community – you need to make commitments and then embed them into how you do business.

6 Meeting the transformative aims of the SDGs

If readers take away one message from this report, it should be that ending malnutrition in all its forms will catalyse improved outcomes across the Sustainable Development Goals (SDGs). And ending malnutrition can be achieved – for all – through implementing all the goals – by everyone. There is incredible potential in integrating nutrition through the SDGs to address multiple goals, universally: as a global community, as nations, as communities, as families and as people. To achieve this transformative vision, governments, non-governmental organisations, the development community and businesses must change their ways of working.

1) Build for nutrition while harnessing nutrition's power across the SDGs

We all need to work differently, and embrace the SDG approach to integration. We must view nutrition as both a cog in the system needed to achieve development goals and as the outcome of a series of interlinked SDGs. We must all stop acting in silos and remember that people do not live in them.

> People do not live their lives in health sectors or education sectors or infrastructure sectors, arranged in tidy compartments. People live in families and villages and communities and countries, where all the issues of everyday life merge.
>
> **Mark Tran, The Guardian**[1]

If you are working across the SDGs, your work will need to factor in nutrition – and the systems it influences – to achieve the SDGs, whether you work in education, health, the public sector, civil society, philanthropy, investment or business. You will need to factor in nutrition if your work involves building infrastructure; fighting poverty, inequalities, or climate change; addressing conflict; or growing, distributing, trading, processing or retailing food. For example, if you work in growing and raising food, considering nutrition means diversifying food production landscapes and supporting the smaller farms that grow nutritious crops, rather than only increasing the yields of the major staple crops. If you are involved in investing in infrastructure, investing in nutrition means constructing infrastructure that delivers nutritious, healthy diets, clean water and sanitation to people in cities and rural settings – not just starchy staples, manufactured foods stripped of their original nutrients, or clean water just for the wealthy. Every community working in each area of development can – and must – act to improve nutrition while also improving other aspects of people's lives.

The analysis in this report gives examples of the ways people in different sectors can benefit from nutrition. For instance, for people fighting climate change, the nutrition community can help by encouraging and empowering people to eat diets in a more sustainable way for the planet, since less resource-intensive diets are essential to reduce greenhouse gas emissions. For people building better health systems, better nutrition reduces the burden on health systems from non-communicable diseases (NCDs), obesity and undernutrition. For those focused on poverty reduction, good nutrition can benefit both economies and individual futures. To enable these synergies to become a reality, the nutrition community must also transform the way it speaks to other sectors by reaching out to ask: what can we do to help you? It must engage on new issues in creative ways. The spirit of integration is to view nutrition as a building block for development, and thus demonstrate how programmes and policies in other areas can benefit from nutrition.

The challenge is to create the incentive to do this. This will require those who have responsibility for the big picture – the chief executive officers, the prime ministers, the directors, the SDG planners – to ensure different parts of governments, companies and organisations understand what their responsibilities are and where they can contribute.

Our call to action for SDG planners, in governments, business and civil society, is to identify one 'triple duty' action – that is, an action that tackles both undernutrition and NCDs or obesity *and* other development goals – that your government, company or organisation will take, and make that action a priority in your SDG implementation plans. And to follow-up by investing human resources, political capital and/or money; the measure of success will be whether you have made investments to prioritise this action.

Our call to action for the nutrition community is to identify one group you do not yet engage with and reach out to them to ask how you can help them achieve goals they care about. The metric is: how many rooms have you been in with people you do not know to learn from where *they* are, and what *they* care about? Get out of your comfort zone.

2) Ensure we all address the problems of obesity and diet-related non-communicable diseases alongside efforts to address stunting, wasting, anaemia and other micronutrient deficiencies

This report shows there are untaken opportunities for 'double duty' actions that can reduce the risk of obesity while acting to address undernutrition. From ensuring nutrition interventions delivered through health systems consider malnutrition in all its forms, to diversifying the types and levels of foods produced by agriculture, everyone concerned with nutrition should no longer be thinking: what can I do to address obesity or stunting or wasting or micronutrient deficiency? But: what can I do to optimise nutrition across the life course?

Our call to action for programme and policy implementers and funders concerned with undernutrition is to review what you are doing and ensure that you are taking opportunities to reduce risks of obesity and diet-related NCDs where you can. You should do this review now, in the next year. Researchers, meanwhile, should work to identify the evidence of where and how these double duty approaches can work most effectively.

3) Be bolder in 'committing' to nutrition

There is now a tremendous opportunity to learn lessons from experience and evidence to enhance commitment to nutrition in the SDG era. This is essential if the UN Decade of Action on Nutrition is to become a 'Decade of Transformative *Impact* for Nutrition'.

First, on making commitments. If the SDGs are about integration, this will mean building nutrition commitments in other development goals, and for other sectors, making SMART (specific, measurable, achievable, relevant and time-bound) commitments to nutrition. If the SDGs are about leaving no one behind, this will mean commitments that address inequality and lead to universal outcomes. If achieving the SDGs is to be more than just aspiration, commitments must be ambitious.

Second, on the nature of commitment. Commitment building is more than a one-off process. If the SDGs really are about transformation, they are about a political process of embedding commitment to nutrition into national structures, policies, plans and actions at national and subnational levels across all sectors. This is about mobilising everyone and developing the networks of people who can work together to effect system-wide change.

Our call to action is that everyone reading this report should make at least one commitment to the Decade of Action on Nutrition over the next 12 months, show how relevant it is for other aspects of the SDGs, and demonstrate how it addresses inequalities to leave no one behind. The commitment should be genuinely SMART and be monitored through an accountability mechanism to ensure it is put into practice through system-wide commitment.

4) Mind the data gaps

Data gaps are hindering accountability and progress. The Global Nutrition Report has consistently called for more rigorous data collection to ensure accountability. If problems are not tracked, they cannot be fully understood nor fully addressed.

To address universality in the way we diagnose, use and act on data, governments and partners need better, more detailed disaggregated data to ensure that marginalised, vulnerable populations are not left behind in the SDG agenda. It is our moral obligation to make that a reality. We also need to fill data gaps if we want to ensure integration. Beyond just collecting data, we need to actively use the data we have on hand to inform and advocate decision-making at the policy level.

Our call to action is to invest significantly in better collection and use of data. Governments need to play the lead role by developing costed plans to gather, disseminate, interpret and use data. Those who work in the data sphere – academics and researchers and UN agencies: you should work to increase government capacities to perform data collection, analysis and interpretation. Governments should build these plans into national development strategies, and resource and implement them. The measure of success is whether data is being collected, collated and used to build the dialogues, partnerships, actions and accountability needed to end malnutrition in all its forms.

5) Scale up investments

Nutrition is still neglected: the proportion of official development assistance (ODA) allocated to nutrition declined between 2014 and 2015, and allocations for diet-related NCDs are only at 0.01% of ODA. We need more investments from donors and multilateral organisations. In the longer term, the key to sustainable

action on nutrition is domestic budgets. We need more investment in direct nutrition interventions, as well as investments in sustainable food production, systems infrastructure, health services, economic and social equity and processes aiming to produce peace and stability – processes that will improve nutrition. We also need to consider other innovative ways of bringing in funding to tackle malnutrition.

Our call to action is: invest differently to achieve global nutrition targets in the Decade of Action on Nutrition. Existing donors – thank you for the commitments you have made to date; please continue to invest, and consider how your money can have more universal, integrated outcomes and where you can be investing 'double duty' or 'triple duty'. Investors who think you have nothing to do with nutrition – make sure what you are funding is benefitting nutrition for all. Innovative funders – fund for innovative change in food systems, health systems and areas of development in ways that can truly drive down malnutrition burdens. The measure of success will be investors across sectors reporting on how they are helping to achieve nutrition outcomes.

In summary:

- **If you are a decision-maker or budget holder engaged in food production and sustainability; in building and investing in infrastructure to support food systems; in delivering clean water, energy and the built environment in cities; in improving health systems; in addressing economic, social and gender inequity; or involved in conflict resolution and rebuilding post-conflict:** seize the 'multiplier effect' that nutrition offers you to achieve the SDGs. Use this report as a springboard to seek more information on how nutrition can catalyse your outcomes.
- **If you are an implementer:** let this report inform your work. Consider nutrition as you plan your programmes, as you measure your impact, as you gather data. Use data – including nutrition data – to inform stronger programmes and stronger SDG outcomes.
- **If you are an advocate:** use this report as an advocacy tool, demonstrating the impact investing in nutrition across the SDGs, and working in an integrated manner – 'for all and by everyone' – can have on reaching the SDGs. Use this report to push for genuinely SMART commitments that will make a difference at national and subnational level, and use the data available to hold those responsible for delivery to account.
- **If you are a researcher:** help fill the evidence and data gaps which are holding the global community back from tackling malnutrition. Help us better understand which double duty actions are best placed to tackle undernutrition, obesity, overweight and NCDs. Help us to see how nutrition's power across the SDGs can be harnessed to address other key human development challenges.

Whoever you are, and whatever you work on, you *can* make a difference to achieving the SDGs, and you *can* help end malnutrition. You can stop the trajectory towards at least one in three people suffering from malnutrition. You can do this by thinking about nutrition as an outcome that can be delivered in an integrated way – and never forgetting we must leave no one behind if we are to deliver universally. The challenge is huge, but dwarfed by the opportunity. Consider how, with each conversation, with each action, you can push for an integrated, universal approach to achieving the SDGs and in so doing, end malnutrition in all its forms.

The bottom line is that nutrition needs some staying power. While global goal setting and dedicated decades for nutrition are important to spur action, let's work to mainstream nutrition, so much so that it is considered commonplace to have optimal nutrition. Let's make good nutrition the global social norm. To do so, first the different communities who work on nutrition outcomes – on undernutrition, obesity, diet-related NCDs, maternal and child health, humanitarian relief – must come together for a stronger voice. Second, nutrition needs to be made compatible with other sectors and ministry's goals, priorities, investments and programmes. Third, implementers need to be motivated and given latitude to be creative in how they incorporate nutrition in their day-to-day operations. And fourth, people must be put at the centre – by inspiring and rallying around this fundamental right that impacts every single one of us and our families.

Appendix

1 Assessing progress towards global nutrition targets – a note on methodology

Maternal, infant and young child nutrition targets

Annual global, regional and national prevalence and trends in maternal and child malnutrition are reported in the annual Joint Child Malnutrition Estimates produced by the United Nations Children's Fund (UNICEF), World Health Organization (WHO) and World Bank.[1] These prevalence estimates are used alongside information about rates of change to assess whether a country is 'on course' or 'off course' to meet each maternal, infant and young child nutrition (MIYCN) target when the global target is applied at the national level, assuming the same relative reduction in all countries.[2] The rules to determine which countries are on or off course are established with extensive technical input from WHO and UNICEF.

The rules used in the *Global Nutrition Reports 2015* and *2016* were different to those employed in the 2014 report, and took into account refinements to methods that better capture the types of information that shape a country's indicator status (such as rate of change, prevalence, frequency of data points and the optimum number of categories used to describe progress). This year, the rules have been updated and revised to accommodate methodological concerns arising from previous methods.

In 2017 the WHO/UNICEF Technical Expert Advisory Group on Nutrition Monitoring (TEAM) revised the methodology and rules to track MIYCN targets to improve the quality of nutrition target monitoring.[3] The revised TEAM methodology will be used to monitor progress until 2025, and will inform the online WHO Global Targets 2025 Tracking Tool, helping countries set national targets, visualise 'what-if' scenarios, and access data on trends and progress in malnutrition indicators.[4]

The assessment exercise aims to differentiate between countries following different trajectories as they progress, so it is important that assessment methodology reflects and helps achieve this objective.

At the country level, average relative percent change in prevalence of an indicator is calculated using a metric called average annual rate of reduction, or AARR. There are two types of AARR: a required AARR ensures that a country achieves the global target, and a current AARR reflects recent trends in prevalence. The required AARR, current AARR and current prevalence (level) are combined to create rules for various on/off track categories for each indicator. The rules devised in 2017 are stated in Table A1.1.

It is important to note that since the goal for exclusive breastfeeding is to *increase* rates rather than *decrease* as for all other indicators, the rate of change must be positive. However, to harmonise assessment criteria, the AARR is still used to track exclusively breastfed but demonstrates a decrease in the proportion of children who are *not* exclusively breastfed, thus representing an increase in the proportion who are exclusively breastfed (since not exclusively breastfed=100-exclusively breastfed).

TABLE A1.1: Proposed monitoring rules and classification of progress towards achieving the six nutrition targets

INDICATOR	ON TRACK	OFF TRACK – SOME PROGRESS	OFF TRACK – NO PROGRESS OR WORSENING
Stunting	AARR > required AARR* or level <5%	AARR < required AARR* but >0.5	AARR < required AARR* and <0.5
Anaemia	AARR >5.2** or level <5%	AARR <5.2 but >0.5	AARR <0.5
Low birth weight	AARR >2.74*** or level <5%	AARR <2.74 but >0.5	AARR <0.5
Not exclusively breastfed	AARR >2.74⁺ or level <30%	AARR <2.74 but >0.8	AARR <0.8
Wasting	Level <5%	Level >5% but AARR >2.0	Level >5% and AARR <2.0

INDICATOR	ON TRACK	OFF TRACK
Overweight	AARR >-1.5	AARR <-1.5

Source: WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring (TEAM), June/2017[5]

*Notes: *Required AARR based on the stunting prevalence change corresponding to a 40% reduction in number of stunted children between 2012 and 2025, considering the estimated population growth estimated (based on data from UN Population Prospects). **Required AARR based on a 50% reduction in prevalence of anaemia in women of reproductive age between 2012 and 2025. ***Required AARR based on a 30% reduction in prevalence of low birth weight between 2012 and 2025. ⁺Required AARR based on a 30% reduction in not exclusively breastfed rate between 2012 and 2025.*

Data requirements and key considerations

- Stunting, wasting, overweight and exclusive breastfeeding: countries require at least two nationally representative survey data points since 2008 to assess recent progress, and one of these must be since 2012 to reflect post-baseline status.
- If countries do not have any post-baseline (2012) data, an assessment is reserved until new survey data becomes available. As a result, less than 50 countries meet the data requirements to be classified in this year's report. It is expected that this number will increase as more data becomes available in coming years.
- To provide reliable trend estimates and aid effective progress monitoring, nationally representative survey data must be collected every three years.
- For anaemia, modelled time-series estimates are available from 1990 to 2016, and so the number of countries currently classified is high. However, only 30 out of 193 (15%) countries have post-baseline (2012) survey estimates, reflecting poor availability of survey data. The results of the classification and data availability should be interpreted with caution.
- National estimates for low birth weight are being produced by an inter-agency/institution group of experts and will be available for use in due course.

Nutrition-related NCD targets

The WHO Global Monitoring Framework for the Prevention and Control of Non-Communicable Diseases (NCDs) was adopted by the World Health Assembly in 2013 to effectively implement the NCD Global Action Plan and monitor progress in NCD prevention and control at the global level. This framework includes nine voluntary targets tracked by 25 indicators of NCD outcomes and risk factors. The overarching goal is to reduce premature mortality due to NCDs by 25% by 2025.[6]

The Global Nutrition Report 2016 tracked target 7 'halt the rise in diabetes and obesity', the NCD target most directly linked to the importance of food and nutrition. This year's report tracks target 7 using new estimates produced by the NCD Risk Factor Collaboration for the WHO, with an altered assessment method to match the new estimation and projection methods. These are discussed in the next section.

Two additional targets, target 4 on reducing salt intake at the population level and target 6 on containing the prevalence of high blood pressure (hypertension), have been included in the Global Nutrition Report reporting and assessment dashboard. However, these targets require further prevalence estimates or refined assessment methods before progress in achieving them can be assessed. These limitations and temporary data substitutes are also discussed next.

Diabetes and obesity

Target 7 of the NCD Action Plan, 'halt the rise in diabetes and obesity,' lists three prevalence indicators: adult overweight and obesity, adolescent obesity and adult diabetes.[7] Of these, adolescent obesity is not yet available in a standardised global database and so it is difficult to assess baseline status or regional variation among this age group.

The Global Nutrition Report reports on age-standardised prevalence of overweight and obesity (BMI ≥25), obesity (BMI ≥30), and diabetes (fasting glucose ≥7.0 mmol/L or medication for raised blood glucose or with a history of diagnosis of diabetes) in men and women in 2014. It also tracks progress on obesity (BMI ≥30) and diabetes using data produced by the NCD Risk Factor Collaboration for the WHO Global Health Observatory data repository and the NCD Global Monitoring Framework.[8] These modelled estimates are used in the absence of globally comparable survey-based data for all countries on prevalence of NCD risk factors.

To track global and national progress on diabetes and obesity the Global Nutrition Report uses projections of obesity and diabetes up to 2025 and the predicted probability that global as well as national prevalence will not increase from 2010 levels.[9] A probability value ≥0.50 is defined as representing a high probability that the 2025 target will be met. Countries were defined as 'on course' if they had a probability of at least 0.50 of meeting the 2025 obesity target and 'off course' if they had a probability of less than 0.50.

Population salt intake

Target 4 to achieve a '30% relative reduction in mean population intake of salt (sodium chloride)' is monitored by age-standardised mean population intake of salt (sodium chloride) in grams per day in people aged 18 and over. There is no available global database on trends and projections in mean sodium consumption. Using data published in large epidemiological modelling studies[10] on estimates of sodium intake in 2010, we classified countries based on how much more or less sodium their populations consumed in relation to the WHO-recommended intake of 2 g/day. Mean sodium intake of ≤2 g/day was classified as 'green', mean intake greater than the recommended 2 g/day but less than or equal to the global average of 4 g/day as 'orange', and mean intake greater than 4 g/day as 'red'.

Intake of salt plays a major role in hypertension and related illness such as stroke and cardiovascular disease,[11] although hypertension is also strongly determined by non-dietary factors such as genetics, ageing, smoking, stress and physical inactivity. An intake of greater than 2 g/day of sodium (5 g or one teaspoon of table salt) contributes to raised blood pressure, and is the maximum daily intake recommended by the WHO.[12] The estimated global average intake in 2010 was twice the WHO-recommended intake – around 4 g/day of sodium or 10 g/day of salt.[13] Reducing sodium intake across populations is also a 'best buy' for targeting NCDs – a cost-effective, high-impact intervention that can be feasibly implemented even in resource-constrained settings.[14]

Raised blood pressure

Target 6 to achieve a '25% relative reduction or contain the prevalence of raised blood pressure' is monitored by age-standardised prevalence of raised blood pressure (systolic and/or diastolic blood pressure ≥140/90 mmHg) in adults aged 18 years and over. Data for prevalence of raised blood pressure in 2015 came from modelled estimates produced by the NCD Risk Factor Collaboration Group.[15] Projections to 2025 and probability of attaining the target are not yet available due to methodological reasons but we will track progress when they become available in 2018.

For progress by country towards global nutrition targets (where data is available), visit the online appendix on the Global Nutrition Report website:

www.globalnutritionreport.org

Appendix

2 Coverage of essential nutrition actions

Table A2.1 and Figure A2.1 show whether the essential nutrition actions are reaching the people who need them (termed 'coverage'). Table A2.1 shows the number of countries with data across each intervention, and the minimum and maximum coverage. Treating children with zinc and iron supplements is considerably low across the countries with data. Figure A2.1 shows countries with the highest and lowest coverage rate of 12 core interventions and practices to address maternal infant and young child nutrition (MIYCN).

TABLE A2.1: Coverage of essential nutrition actions

Coverage/practice indicator	Associated intervention recommended by Bhutta et al, 2013 (target population)	Number of countries with data	Minimum %	Maximum %	Mean %	Median % for countries with data
Children 0–59 months with diarrhoea who received zinc treatment	Zinc treatment for diarrhoea (children aged 0–59 months)*	46	0	28	5	2
Early initiation of breastfeeding (proportion of infants who were put to the breast within 1 hour of birth	Protection, promotion and support of breastfeeding*	125	14	93	52	52
Children <6 months old who were exclusively breastfed	Protection, promotion and support of breastfeeding*	137	0.3	87	38	36
Children 12–15 months who are breastfed	Protection, promotion and support of breastfeeding*	128	12	98	67	71
Children 6–23 months fed 4+ food groups (minimum dietary diversity)	Promotion of complementary feeding for food-secure and food-insecure populations (children aged 6–23 months)*	60	5	90	36	30
Children 6–23 months fed the minimum meal frequency	Promotion of complementary feeding for food-secure and food-insecure populations (children aged 6–23 months)*	82	12	94	56	58
Children 6–23 months with 3 infant and young child feeding practices (minimum acceptable diet)	Promotion of complementary feeding for food-secure and food-insecure populations (children aged 6–23 months)*	60	3	72	21	14
Children 6–59 months who received two doses of vitamin A supplements in 2014	Vitamin A supplementation (children aged 0–59 months)*	57	0	99	65	79

Continued on next page

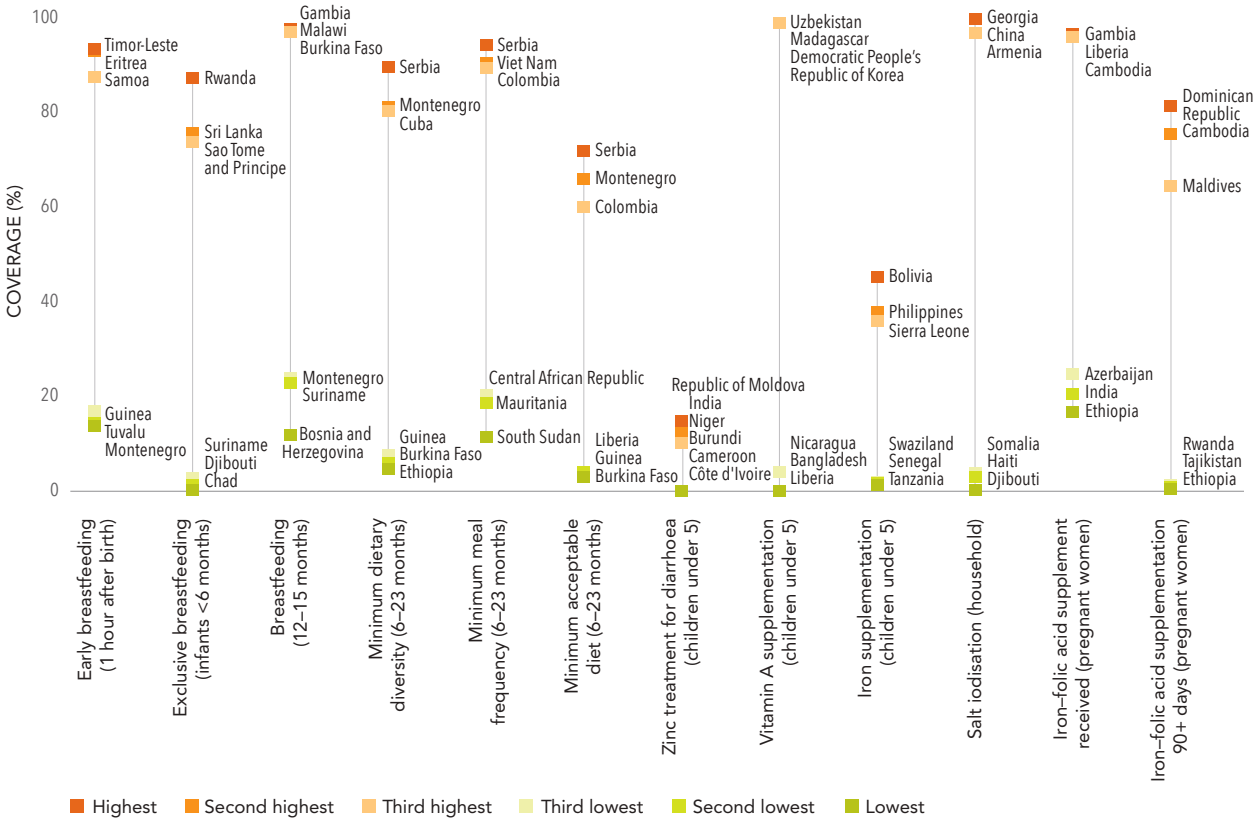
TABLE A2.1: Coverage of essential nutrition actions (continued)

Coverage/practice indicator	Associated intervention recommended by Bhutta et al, 2013 (target population)	Number of countries with data	Minimum %	Maximum %	Mean %	Median % for countries with data
Children 6–59 months given iron supplements in past 7 days	Neither Bhutta et al nor WHO, 2013, recommend this intervention	53	2	45	15	12
Household consumption of adequately iodised salt	Universal salt iodisation*	84	0	100	57	62
Women with a birth in last five years who received iron and folic acid during their most recent pregnancy	Multiple micronutrient supplementation (pregnant women)	62	17	97	73	80
Women with a birth in last five years who received iron and folic acid during the most recent pregnancy and *did not* take it	Multiple micronutrient supplementation (pregnant women)	55	3	83	27	21
Women with a birth in last five years who received iron and folic acid in the most recent pregnancy and took it for 90+ days	Multiple micronutrient supplementation (pregnant women)	59	0.4	82	31	30

Source: Kothari M, 2016 and UNICEF global databases, 2016.[1] For India, new data from Rapid Survey on Children 2013–2014 is used where applicable.

*Notes: *Interventions recommended by the World Health Organization (WHO)'s e-Library of Evidence for Nutrition Actions.[2] Multiple micronutrient supplementation recommended by Bhutta et al.[3] Data is from Demographic and Health Surveys, Multiple Indicator Cluster Surveys and national surveys conducted between 2005 and 2015. Surveys older than 2005 have been excluded from this table pending WHO ratification of this recommendation.*

FIGURE A2.1: Countries with the highest and lowest coverage rates of 12 interventions and practices to address maternal and child malnutrition, 2017 (based on data from 2005–2015)



Source: Authors, based on data from Kothari M, 2016 and UNICEF global databases, 2016[4], the latter based on Multiple Indicator Cluster Surveys, Demographic and Health Surveys, and other nationally representative surveys conducted between 2005 and 2015.

Appendix

3 Country nutrition expenditure methodology

The Scaling Up Nutrition (SUN) Movement proposes an approach to track nutrition expenditures based on two compulsory steps (Step 1 and Step 2) and one optional step (Step 3). In Step 1, broad allocations are identified in the government budget that may be relevant to nutrition. In Step 2, the broad allocations are classified into nutrition-specific and nutrition-sensitive categories and validated through consultations among key stakeholders. The optional step 3 involves attributing a percentage of the allocated budget to nutrition (weighting). The weighted percentage should be based on the categorisation (Step 2), but also on a judgement call by national experts to estimate investments towards nutrition components/activities in the programme. The weighted results are effectively the 'perceived' allocations that relate to nutrition. For SUN countries, when the data from the budget analysis exercise is expressed as 'upper-bound' figures, this means the allocations have not been weighted. 'Upper-bound' estimates are the dollar-for-dollar values, simply as they exist.

Weighting broad allocations – experience from the SUN Movement

During the first round of budget analysis in 2015, 14 countries applied weights to their broad allocations. When applying weights, these countries judged most (94%) of the upper-bound nutrition-*specific* allocations to be actual allocations and only 29% of the upper-bound nutrition-*sensitive* allocations to be actual allocations. The mean and the median weights were 29% and 25% respectively for all identified sectors (agriculture, health, education, social protection and water, sanitation and hygiene). However, there was significant variation between the reported smallest and largest weights.

In the analysis presented in the *Global Nutrition Report 2016*, Greener and colleagues[1] applied the mean weight from 14 countries to 8 new countries to derive the percentages that were used (Table A3.1).

During the second round of budget analysis in 2016, only two countries (Indonesia and El Salvador) applied weights to their broad allocations. Most countries decided against the weighting of their budget allocations because of the level of subjectivity in applying the weights, even when done through a consultation for each budget line item. Some people also questioned the use of applying a weight when sectoral investments are later presented to people who were not directly involved in the budget analysis and or familiar with the assumptions. Applying weights was seen as detrimental when discussing sectoral investments with budget holders and programme managers outside the nutrition community.

TABLE A3.1: Coverage of essential nutrition actions

	Minimum		Budget lines		Reported weights			
Thematic sector	In dataset	With weights	In dataset	With weights	Smallest	Largest	Mean	Median
Agriculture	23	14	745	341	1%	100%	29%	25%
Education	18	10	131	52	5%	100%	38%	25%
Health	24	14	421	170	5%	100%	34%	25%
Other	7	4	27	10	1%	25%	16%	18%
Social protection	20	11	248	126	1%	100%	25%	25%
WASH	21	12	260	170	3%	100%	22%	25%
Total	24	14	1,832	869	1%	100%	29%	25%

Source: Greener R et al.[2]

Notes: WASH: Water, sanitation and hygiene.

Notes

Notes

Executive summary

Sources for graphic:

2 billion people lack key micronutrients like iron and vitamin A: **World Health Organization (WHO)**. Guidelines on Food Fortification with Micronutrients. Geneva: WHO, 2009. Available at: http://www.who.int/nutrition/publications/micronutrients/9241594012/en/.

155 million children are stunted; 52 million children are wasted; 41 million children are overweight: **United Nations Children's Fund (UNICEF), WHO and World Bank Group**. UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition.

2 billion adults are overweight or obese: **WHO**. Global Health Observatory (GHO) data. Overweight and obesity. Adults aged 18+. Available at: http://www.who.int/gho/ncd/risk_factors/overweight_text/en/ (accessed 1 July 2017).

Malnutrition has a high economic and health cost and a return of $16 for every $1 invested: **International Food Policy Research Institute (IFPRI)**. Global Nutrition Report 2014. Actions and Accountability to Accelerate the World's Progress on Nutrition. Washington, DC: IFPRI, 2014.

1 in 3 people are malnourished: **IFPRI**. Global Nutrition Report 2015. Actions and accountability to advance nutrition and sustainable development. Washington, DC: IFPRI, 2015.

Chapter 1

1. IFPRI. Global Food Policy Report. Washington, DC: IFPRI, 2017.
2. Serious levels of nutritional problems are: stunting in children aged under 5 years ≥20%; anaemia in women of reproductive age ≥20%; overweight (body mass index ≥25) in adult women aged 18+ years ≥35%.
3. **UNICEF, WHO and World Bank Group.** UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition. 2017; **WHO**. WHO Global Targets 2025 Tracking Tool (version 3 – May 2017): Global Progress Report. 2017a. Available at: http://www.who.int/nutrition/trackingtool/en/ (accessed 1 July 2017); **WHO**. Global Health Observatory data repository: Prevalence of overweight among adults, BMI ≥ 25, age-standardized. Estimates by country, 2017b. Available at: http://apps.who.int/gho/data/node.main.A897A?lang=en (accessed 1 May 2017).
4. **UNICEF, WHO and World Bank Group.** UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition. 2017. Available at: http://www.who.int/nutgrowthdb/estimates/en/ (accessed 15 August 2017); **WHO**. WHO Global Targets 2025 Tracking Tool (version 3 – May 2017): Global Progress Report. 2017. Available at: http://www.who.int/nutrition/trackingtool/en/ (accessed 1 July 2017); **UNICEF**. From the first hour of life: Making the case for improved infant and young child feeding everywhere. New York: UNICEF, 2016; **WHO**; Global Health Observatory data repository: Prevalence of overweight among adults, BMI ≥ 25, age-standardized. Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A897A?lang=en (accessed 1 May 2017); **NCD Risk Factor Collaboration (NCD-RisC)**. Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. The Lancet, 2016. 387(10027): 1513-30; **NCD-RisC**. Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. The Lancet, 2016. 387(10026): 1377-96; **NCD-RisC**. Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017); **WHO**. Global Health Observatory data repository: Raised fasting blood glucose (≥7.0 mmol/L or on medication). Data by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A869?lang=en (accessed 1 May 2017); **WHO**. Global Health Observatory data repository: Raised blood pressure (SBP ≥140 OR DBP ≥90), age-standardized (%). Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A875STANDARD?lang=en (accessed 1 May 2017); **WHO**. Global Health Observatory data repository: Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A900A?lang=en (accessed 1 May 2017); **Zhou B, Bentham J, Di Cesare M et al.** Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. The Lancet, 2017. 389(10064): 37-55; **WHO**. Global Health Observatory (GHO) data. Overweight and obesity. Adults aged 18+, 2017. Available at: http://www.who.int/gho/ncd/risk_factors/overweight_text/en/ (accessed 1 July 2017); **Mozaffarian D, Fahimi S, Singh GM et al.** Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 2014. 371(7): 624-34.
5. UNICEF. Famine Response. Progress Update (11 July 2017). New York: UNICEF, 2017.
6. Devi S. Famine in South Sudan. The Lancet, 2017. 389(10083): 1967-70.
7. UNICEF. Famine Response. Progress Update (11 July 2017). New York: UNICEF, 2017.
8. Food and Agriculture Organization (FAO). World hunger on the rise again, reversing years of progress. 2017. Available at: http://www.fao.org/news/story/en/item/902489/icode/ (accessed 18 July 2017).
9. FAO, IFAD, UNICEF, World Food Programme and WHO. The State of Food Security and Nutrition in the World 2017. Rome: FAO, 2017. Available at: http://www.fao.org/3/a-I7695e.pdf (accessed 19 September 2017).
10. UNICEF. Famine Response. Progress Update (11 July 2017). New York: UNICEF, 2017.
11. Coopman A, Osborne D, Ullah F et al. Seeing the Whole: Implementing the SDGs in an Integrated and Coherent Way. London: Stakeholder Forum, 2016.
12. UN. Resolution adopted by the General Assembly on 25 September 2015. 70/1. Transforming our world: the 2030 Agenda for Sustainable Development.
13. (1) Maternal multiple micronutrient supplements to all; (2) Calcium supplementation to mothers at risk of low intake; (3) Maternal balanced energy protein supplements as needed; (4) Universal salt iodisation; (5) Promotion of early and exclusive breastfeeding for 6 months and continued breastfeeding for up to 24 months; (6) Appropriate complementary feeding education in food secure populations and additional complementary food supplements in food insecure populations; (7) Vitamin A supplementation between 6 and 59 months of age; (8) Preventative zinc supplements between 12 and 59 months of age; (9) Management of moderate acute malnutrition; (10) Management of severe acute malnutrition.
14. Bhutta ZA, Das JK, Rizvi A et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet, 2013. 382(9890): 452-77.
15. NCD Alliance. NCDs across the SDGs: A call for an integrated approach. 2017. Available at: https://ncdalliance.org/sites/default/files/resource_files/NCDs_Across_SDGs_English_May2017.pdf (accessed 1 July 2017).

16. **Development Initiatives**. P20 Initiative: Baseline report. Bristol, UK: Development Initiatives, 2017. Available at: http://devinit.org/post/p20-initiative-data-to-leave-no-one-behind/ (accessed 15 August 2017), page 23; and see **UNICEF**. Every Child's Birth Right: Inequities and trends in birth registration. New York: UNICEF, 2013. Available at: www.unicef.org/publications/index_71514.html (accessed 15 August 2017).

17. Development Initiatives. P20 Initiative: Baseline report. Bristol, UK: Development Initiatives, 2017. Available at: http://devinit.org/post/p20-initiative-data-to-leave-no-one-behind/ (accessed 15 August 2017).

18. **Bhutta ZA, Das JK, Rizvi A et al.** Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet, 2013. 382(9890): 452-77; **Ruel MT, Alderman H.** Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? The Lancet, 2013. 382(9891): 536-51.

19. IFPRI (Gillespie S, Hodge J, Yosef S, Pandya-Lorch R). Nourishing Millions: Stories of Change in Nutrition. Washington, DC: IFPRI, 2016.

20. Pelletier DL, Frongillo EA, Gervais S et al. Nutrition agenda setting, policy formulation and implementation: lessons from the Mainstreaming Nutrition Initiative. Health Policy and Planning. 2011, 27(1), 19-31.

21. Ruel MT, Alderman H. Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? The Lancet, 2013. 382(9891): 536-51.

22. FAO. Second International Conference on Nutrition. Report of the Joint FAO/WHO Secretariat on the Conference, 2015. Available at: http://www.fao.org/3/a-i4436e.pdf (accessed 25 August 2017).

23. OECD. Better Policies for Sustainable Development 2016. A New Framework for Policy Coherence. Paris: OECD, 2016.

24. OECD. Better Policies for Sustainable Development 2016. A New Framework for Policy Coherence. Paris: OECD, 2016.

25. **Coopman A, Osborne D, Ullah F et al.** Seeing the Whole: Implementing the SDGs in an Integrated and Coherent Way. London: Stakeholder Forum, 2016; **International Council for Science**, A guide to SDG interactions: From science to implementation, ed. M Nilsson et al., 2017, Paris: International Council for Science; **Le Blanc D**, Towards Integration at Last? The Sustainable Development Goals as a Network of Targets. Sustainable Development, 2015. 23(3): 176-87.

26. **OECD.** Better Policies for Sustainable Development 2016. A New Framework for Policy Coherence. Paris: OECD, 2016; **Millennium Institute.** iSDG Integrated Simulation Tool. Policy coherence and integration to achieve the sustainable development goals, 2017. Available at: http://www.isdgs.org/ (accessed 1 July 2017).

27. WHO. Double-duty actions for nutrition: policy brief, WHO/NMH/NHD/17.2, 2017. Available at: www.who.int/nutrition/publications/double-duty-actions-nutrition-policybrief/en/ (accessed 4 September 2017).

28. Buse K, Hawkes S. Health in the sustainable development goals: ready for a paradigm shift? Globalization and Health, 2015. 11(1): 13.

29. Sahn DE, Stifel D. Exploring Alternative Measures of Welfare in the Absence of Expenditure Data. Review of Income and Wealth, 2003. 49(4): 463-89.

30. Coopman A, Osborne D, Ullah F et al. Seeing the Whole: Implementing the SDGs in an Integrated and Coherent Way. London: Stakeholder Forum, 2016.

31. OECD. Better Policies for Sustainable Development 2016. A New Framework for Policy Coherence. Paris: OECD, 2016.

32. UKSSD and Bond. Progressing national SDGs implementation: Experiences and recommendations from 2016. London: Bond, 2016.

33. EAT Forum. EAT Talk: Sir Bob Geldof at Stockholm Food Forum 2017. Available at: http://eatforum.org/article/how-to-create-an-activist-movement-and-initiate-global-change/ (accessed 1 July 2017).

34. UN Standing Committee on Nutrition. UN Decade of Action on Nutrition (2016–2025) Work Programme. 2017. Available at: https://www.unscn.org/uploads/web/news/Work-Programme_UN-Decade-of-Action-on-Nutrition-20170517.pdf (accessed 1 July 2017).

35. Ayala A and Mason Meier B. A human rights approach to the health implications of food and nutrition insecurity, Public Health Reviews, 2017. 38, 10. DOI: 10.1186/s40985-017-0056-5.

36. **WHO**. Double-duty actions for nutrition: policy brief. Geneva: WHO/NMH/NHD/17.2, 2017; **WHO**. The double burden of malnutrition: policy brief. Geneva: WHO/NMH/NHD/17.3, 2017.

37. **WHO**. Double-duty actions for nutrition: policy brief. Geneva: WHO/NMH/NHD/17.2, 2017; **WHO**. The double burden of malnutrition: policy brief. Geneva: WHO/NMH/NHD/17.3, 2017.

38. Your value for money.

Chapter 2

1. World Health Organization (WHO). Introduction: Global Nutrition Targets Policy Brief Series. 2014. Available at: http://www.who.int/nutrition/topics/globaltargets_policybrief_overview.pdf?ua=1 (accessed 1 May 2017).

2. WHO. Global Status Report on Non-Communicable Diseases 2014. Geneva: WHO, 2014.

3. WHO. Ambition and Action in Nutrition 2016-2025. Geneva: WHO, 2017.

4. WHO. Comprehensive Implementation Plan on Maternal, Infant and Young Child Feeding. Geneva: WHO, 2014.

5. WHO. Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020. Geneva: WHO, 2013.

6. **WHO.** Introduction: Global Nutrition Targets Policy Brief Series. 2014. Available at: http://www.who.int/nutrition/topics/globaltargets_policybrief_overview.pdf?ua=1 (accessed 1 May 2017); **WHO.** Global Status Report on Non-Communicable Diseases 2014. Geneva: WHO, 2014; **UN Statistical Division.** Revised list of global Sustainable Development Goal indicators March 2017. Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (E/CN.3/2017/2), Annex III. New York: UN Statistical Division, 2017.

7. **WHO.** Global Status Report on Non-Communicable Diseases 2014. Geneva: WHO, 2014; **NCD Risk Factor Collaboration (NCD-RisC),** Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. The Lancet, 2016. 387(10027): 1513-30; **NCD-RisC.** Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. The Lancet, 2016. 387(10026): 1377-96; **Stevens GA, Finucane MM, De-Regil LM 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): e16-25; **WHO.** Global targets 2025. WHO 2012. Available at: http://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/ (accessed 1 July 2017); **Zhou B, Bentham J, Di Cesare M et al.** Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. The Lancet, 2017. 389(10064): 37-55; **United Nations Children's Fund (UNICEF).** From the first hour of life: Making the case for improved infant and young child feeding everywhere. New York: UNICEF, 2016.

8. See: http://www.globalnutritionreport.org/the-data/nutrition-country-profiles/, and for the underlying datasets see: http://www.globalnutritionreport.org/the-data/dataset-and-metadata/

9. **UNICEF, WHO, World Bank Group.** UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition, 2017. Available at: http://www.who.int/nutgrowthdb/estimates/en/ (accessed 15 August 2017); **Stevens GA, Finucane MM, De-Regil LM 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): e16-25; **NCD-RisC.** Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017).

10. WHO, UNICEF, for the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring. Methodology for monitoring progress towards the global nutrition targets for 2025: Technical report. Geneva: WHO, New York: UNICEF, 2017.

11. UNICEF, WHO, World Bank Group. UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition, 2017. Available at: http://www.who.int/nutgrowthdb/estimates/en/ (accessed 15 August 2017).

12. UNICEF, WHO, World Bank Group. UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition, 2017. Available at: http://www.who.int/nutgrowthdb/estimates/en/ (accessed 15 August 2017).

13. WHO. WHO Global Targets 2025 Tracking Tool (version 3 – May 2017): Indicator mapping – Anaemia. 2017. Available at: http://www.who.int/nutrition/trackingtool/en/ (accessed 30 June 2017).

14. **WHO.** WHO Global Targets 2025 Tracking Tool (version 3 – May 2017): Indicator mapping – Anaemia. 2017. Available at: http://www.who.int/nutrition/trackingtool/en/ (accessed 30 June 2017); **NCD-RisC.** Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. The Lancet, 2016. 387(10026): 1377-96; **NCD-RisC.** Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017).

15. **WHO.** Global Health Observatory data repository: Raised fasting blood glucose (≥7.0 mmol/L or on medication). Data by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A869?lang=en (accessed 1 May 2017); **NCD-RisC.** Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. The Lancet, 2016. 387(10027): 1513-30; **NCD-RisC.** Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017).

16. **WHO.** Global Health Observatory data repository: Raised blood pressure (SBP ≥140 OR DBP ≥90), age-standardized (%). Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A875STANDARD?lang=en (accessed 1 May 2017); **Zhou B, Bentham J, Di Cesare M et al.** Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. The Lancet, 2017. 389(10064): 37-55; **NCD-RisC.** Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017).

17. **Mozaffarian D, Fahimi S, Singh GM et al.** Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 2014. 371(7): 624-34; **Powles J, Fahimi S, Micha R et al.** Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open, 2013. 3(12).

18. WHO. Guideline: Sodium Intakes for Adults and Children. Geneva: WHO, 2012.

19. **Mozaffarian D, Fahimi S, Singh GM et al.** Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 2014. 371(7): 624-34; **Powles J, Fahimi S, Micha R et al.** Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open, 2013. 3(12).

20. International Food Policy Research Institute (IFPRI). Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, Panel 2.2.

21. IFPRI. Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development. Washington, DC: IFPRI, 2015.

22. IFPRI. Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, Chapter 8.

23. Save the Children. Group-based Inequality Database (GRID). Available at: https://campaigns.savethechildren.net/grid.

24. IFPRI. Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, Panel 8.2, page 100.

25. IFPRI. Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, Panel 8.4, page 107.

26. IFPRI. Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development. Washington DC: IFPRI, 2015, Panel 9.2, page 111.

27. See Chapter 9, Table 9.1, page 112.

28. Global Panel on Agriculture and Food Systems for Nutrition (GloPAN). Food systems and diets: Facing the challenges of the 21st century. London, UK: GloPAN, 2016, page 44.

29. **Das JK, Salam RA, Thornburg KL et al.** Nutrition in adolescents: physiology, metabolism, and nutritional needs. Annals of the New York Academy of Sciences, 2017. 1393(1): 21-33; **Darnton-Hill I, Nishida C, James WP.** A life course approach to diet, nutrition and the prevention of chronic diseases. Public Health Nutrition, 2004. 7(1a): 101-21.

30. Rivera JA, de Cossio TG, Pedraza LS et al. Childhood and adolescent overweight and obesity in Latin America: a systematic review. The Lancet Diabetes & Endocrinology, 2014. 2(4): 321-32.

31. Bhutta ZA, Lassi ZS, Bergeron G et al. Delivering an action agenda for nutrition interventions addressing adolescent girls and young women: priorities for implementation and research. Annals of the New York Academy of Sciences, 2017. 1393(1): 61-71.

32. Sheehan P, Sweeny K, Rasmussen B et al. Building the foundations for sustainable development: a case for global investment in the capabilities of adolescents. The Lancet, 2017.

33. Global Burden of Disease Pediatrics Collaboration. Global and national burden of diseases and injuries among children and adolescents between 1990 and 2013: Findings from the global burden of disease 2013 study. JAMA Pediatrics, 2016. 170(3): 267-87.

34. **Abajobir AA, Abate KH, Abbafati C et al.** Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet, 2017. 390(10100): 1345-1422; **Haddad L, Hawkes C, Webb P et al.** A new global research agenda for food. Nature, 2016. 540(7631): 30-32.

35. WHO Indicators for assessing infant and young child feeding practices. Part 1 Definitions, 2008. Available at: http://apps.who.int/iris/bitstream/10665/43895/1/9789241596664_eng.pdf (accessed 15 August 2017).

36. Food and Agricultural Organization (FAO) and FHI 360. Minimum dietary diversity for women: A guide to measurement. Rome: FAO and FHI 360, 2016.

37. Herforth A, Rzepa A. Seeking Indicators of Healthy Diets. It Is Time to Measure Diets Globally. How? Washington, DC: Gallup and Swiss Agency for Development and Cooperation, 2016.

38. Vosti SA, Kagin J, Engle-Stone R, Brown KH. An Economic Optimization Model for Improving the Efficiency of Vitamin A Interventions. An application to young children in Cameroon. Food and Nutrition Bulletin, 2015. 36(3 suppl): S193-S207.

Chapter 3

1. **Coopman A, Osborne D, Ullah F et al.** Seeing the Whole: Implementing the SDGs in an Integrated and Coherent Way. London: Stakeholder Forum, 2016; **Le Blanc D,** Towards Integration at Last? The Sustainable Development Goals as a Network of Targets. Sustainable Development, 2015. 23(3): 176-87; OECD. Better Policies for Sustainable Development 2016. A New Framework for Policy Coherence. Paris: OECD, 2016. **Millennium Institute.** iSDG Integrated Simulation Tool. Policy coherence and integration to achieve the sustainable development goals, 2017. Available at: http://www.isdgs.org/ (accessed 1 July 2017).

2. International Council for Science, A guide to SDG interactions: From science to implementation, ed. M Nilsson et al., 2017, Paris: International Council for Science.

3. BOND and UKSSD. Progressing national SDGs implementation: Experiences and recommendations from 2016, 2016. London: Bond.

4. [a]**Challinor AJ, Watson J, Lobell DB et al.** 2014. A meta-analysis of crop yield under climate change and adaptation. Nature Climate Change, 4(4), 287. [b]**Myers SS, Zanobetti A, Kloog I et al.** 2014. Increasing CO2 threatens human nutrition. Nature, 510(7503), 139-42. [c]**Myers SS, Wessells KR, Kloog I et al.** Rising atmospheric CO2 increases global threat of zinc deficiency. The Lancet Global Health, 2015. 3(10), p.e639. [d]**Myers SS, Smith MR, Guth S et al.** 2017. Climate change and global food systems: Potential impacts on food security and undernutrition. Annual Review of Public Health, 38, 259-77. [e]**Dietterich LH, Zanobetti A, Kloog I et al.** 2015. Impacts of elevated atmospheric CO2 on nutrient content of important food crops. Scientific Data, 2, sdata.2015.36. [f]**Smith MR, Golden CD and Myers SS.** Anthropogenic carbon dioxide emissions may increase the risk of global iron deficiency. GeoHealth, 2017. [g]**Marlow HJ, Hayes WK, Soret S et al.** Diet and the environment: does what you eat matter? American Journal of Clinical Nutrition, 2009. 89(5): 1699s-1703s. [h]**Food and Agricultural Organization (FAO).** Energy-Smart Food for People and Climate. Issue Paper. Rome: FAO, 2011. [i]**United Nations Environment Programme (UNEP).** Assessing the Environmental Impacts of Production and Consumption: A Report of the Working Group on the Environmental Impacts of Products and Materials to the International Panel for Sustainable Resource Management. Geneva: UNEP, 2010. [j]**UN Department of Economic and Social Affairs (Population Division).** World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352). New York: UN Department of Economic and Social Affairs, 2014. [k]**Ruel M, Garrett J, Yosef S.** Food Security and Nutrition: Growing Cities, New Challenges. Global Food Policy Report 2017. Washington, DC: International Food Policy Research Institute (IFPRI), 2017; [l]**Hawkes C, Harris J and Gillespie S,** Changing diets: urbanization and the nutrition transition. Global Food Policy Report 2017. Washington, DC: IFPRI, 2017. [m]**Shekar M, Kakietek J, Eberwein J and Walters D.** An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Washington, DC: The World Bank, 2016. [n]**Global Panel on Agriculture and Food Systems for Nutrition.** Food systems and diets: Facing the challenges of the 21st century. London, UK: Global Panel on Agriculture and Food Systems for Nutrition, 2016. [o]**IFPRI.** Global Nutrition Report 2014. Actions and Accountability to Accelerate the World's Progress on Nutrition. Washington, DC: IFPRI, 2014, 8-9. [p]**Black RE, Victora CG, Walker SP et al.** Maternal and child undernutrition and overweight in low-income and middle-income countries. The Lancet, 2013. 382(9890): 427-51. [q]**Alderman H, Headey DD.** How Important is Parental Education for Child Nutrition? World Development, 2017. 30(94): 448-64. [r]**Webb P, Block S.** Support for agriculture during economic transformation: Impacts on poverty and undernutrition. Proceedings of the National Academy of Sciences, 2012. 109(31): 12310 [s]**Horton S, Steckel RH.** Malnutrition. Global economic losses attributable to malnutrition 1900–2000 and projections to 2050. In: B Lomborg, ed. How much have global problems cost the world? A scorecard from 1900 to 2050. New York: Cambridge University Press, 2013. [t]**Hoddinott J, Maluccio JA, Behrman JR et al.** Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. The Lancet, 2008. 371(9610): 411-6. [u]**Chan HS, Knight C, Nicholson M.** Association between dietary intake and 'school-valued' outcomes: a scoping review. Health Education Research, 2017. 32(1), 48-57. [v]**FAO.** Peace and Food Security: Investing in resilience to sustain rural livelihoods and conflict. FAO: Rome, 2016.

5. Marlow HJ, Hayes WK, Soret S et al. Diet and the environment: does what you eat matter? American Journal of Clinical Nutrition, 2009. 89(5): 1699s-1703s.

6. FAO. FAOSTAT: Land Use, 2017. Available at: http://www.fao.org/faostat/en/ - data/RL (accessed 18 July 2017).

7. FAO. Energy-Smart Food for People and Climate. Issue Paper. Rome: FAO, 2011.

8. UNEP. Assessing the Environmental Impacts of Production and Consumption: A Report of the Working Group on the Environmental Impacts of Products and Materials to the International Panel for Sustainable Resource Management. Geneva: UNEP, 2010.

9. Ranganathan J et al. Shifting Diets for a Sustainable Food Future: Creating a Sustainable Food Future. Working Paper 11. Washington, DC: World Resources Institute, 2016. Available at: www.wri.org/sites/default/files/Shifting_Diets_for_a_Sustainable_Food_Future_0.pdf.

10. **Dewey KG and Adu-Afarwuah S.** Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. Maternal & Child Nutrition, 2008. 4(s1), 24-85; **Zeisel, SH and Da Costa KA.** Choline: an essential nutrient for public health. Nutrition Reviews, 2009. 67(11), 615-23.

11. **Ranganathan J et al.** Shifting Diets for a Sustainable Food Future: Creating a Sustainable Food Future. Working Paper 11. Washington, DC: World Resources Institute, 2016. Available at: www.wri.org/sites/default/files/Shifting_Diets_for_a_Sustainable_Food_Future_0.pdf; **Whitmee S, Haines A, Beyere C et al.** 2015. Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation–Lancet Commission on planetary health. The Lancet, 386(10007), 1973-2028; **Tilman D and Clark M.** Global diets link environmental sustainability and human health. Nature, 2014. 515(7528), 518-22.

12. World Cancer Research Fund International. Colorectal cancer. Available at: http://www.wcrf.org/int/research-we-fund/continuous-update-project-findings-reports/colorectal-bowel-cancer (accessed 13 September 2017).

13. Challinor AJ, Watson J, Lobell DB et al. 2014. A meta-analysis of crop yield under climate change and adaptation. Nature Climate Change, 4(4), 287.

14. **Myers SS, Zanobetti A, Kloog I et al.** Increasing CO2 threatens human nutrition. Nature, 2014. 510(7503): 139-42; **Dietterich LH, Zanobetti A, Kloog I et al.** Impacts of elevated atmospheric CO2 on nutrient content of important food crops. Scientific Data, 2, sdata.2015.36.

15. **Myers SS, Zanobetti A, Kloog I et al.** 2014. Increasing CO2 threatens human nutrition. Nature, 510(7503), 139-142; **Myers SS, Smith MR, Guth S et al.** 2017. Climate change and global food systems: Potential impacts on food security and undernutrition. Annual Review of Public Health, 38, 259-277; **Dietterich LH, Zanobetti A, Kloog I et al.** 2015. Impacts of elevated atmospheric CO2 on nutrient content of important food crops. Scientific Data, 2, sdata.2015.36; **Smith MR, Golden CD and Myers SS.** Anthropogenic carbon dioxide emissions may increase the risk of global iron deficiency. GeoHealth, 2017; **Myers SS, Wessells KR, Kloog I et al.** Rising atmospheric CO2 increases global threat of zinc deficiency. The Lancet Global Health, 2015. 3(10), p.e639.

16. Cheung WWL, Lam VWY, Sarmiento JL et al. Large-scale redistribution of maximum fisheries catch potential in the global ocean under climate change. Global Change Biology, 2010. 16(1): 24-35.

17. High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Sustainable fisheries and aquaculture for food security and nutrition. Rome: Committee on World Food Security, 2014.

18. **Swanson D, Block R and Mousa SA.** Omega-3 fatty acids EPA and DHA: health benefits throughout life. Advances in Nutrition: An International Review Journal, 2012. 3(1), 1-7; **Imhoff-Kunsch B, Briggs V, Goldenberg T and Ramakrishnan U.** Effect of n-3 long-chain polyunsaturated fatty acid intake during pregnancy on maternal, infant, and child health outcomes: a systematic review. Paediatric and Perinatal Epidemiology, 2012. 26 Suppl 1, 91-107; **Virtanen JK, Mozaffarian D, Chiuve SE and Rimm EB.** Fish consumption and risk of major chronic disease in men. The American Journal of Clinical Nutrition, 2008. 88(6), 1618-25.

19. Committee on a Framework for Assessing the Health, Environmental, and Social Effects of the Food System. A Framework for Assessing Effects of the Food System. Annex 1. Dietary Recommendations for Fish Consumption, 2015. Available at: https://www.ncbi.nlm.nih.gov/books/NBK305180/ (accessed 7 September 2017).

20. Herrero M, Thornton PK, Power B et al. Farming and the geography of nutrient production for human use: a transdisciplinary analysis. The Lancet Planetary Health, 2017. 1(1): e33-e42.

21. Herrero M, Thornton PK, Power B, et al. Farming and the geography of nutrient production for human use: a transdisciplinary analysis. The Lancet Planetary Health, 2017. 1(1): e33-e42.

22. Jones AD. On-Farm Crop Species Richness is Associated with Household Diet Diversity and Quality in Subsistence- and Market-Oriented Farming Households in Malawi. The Journal of Nutrition, 2017. 147(1): 86-96.

23. Remans R, DeClerck FAJ, Kennedy G and Fanzo J. Expanding the view on the production and dietary diversity link: Scale, function, and change over time. Proceedings of the National Academy of Sciences of the United States of America, 2015. 112(45): E6082.

24. Hawkes C, Friel S, Lobstein T and Lang T. Linking agricultural policies with obesity and noncommunicable diseases: A new perspective for a globalising world. Food Policy, 2012. 37(3): 343-53.

25. Herrero M, Thornton PK, Power B et al. Farming and the geography of nutrient production for human use: a transdisciplinary analysis. The Lancet Planetary Health, 2017. 1(1): e33-e42.

26. **Shekar M, Kakietek J, Eberwein J and Walters D.** An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Washington, DC: The World Bank, 2016; and **Global Panel on Agriculture and Food Systems for Nutrition (GloPAN).** Food systems and diets: Facing the challenges of the 21st century. London, UK: GloPAN.

27. IFPRI. Global Nutrition Report 2014. Actions and Accountability to Accelerate the World'S Progress on Nutrition. Washington, DC: IFPRI, 2014, 8-9.

28. India, Ministry of Finance: Economic Survey 2015–16, 2016, cited in International Food Policy Research Institute (IFPRI). Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, page 3.

29. **World Economics.** Global Growth Tracker, 2016. Available at: http://www.worldeconomics.com/papers/Global Growth Monitor_7c66ffca-ff86-4e4c-979d-7c5d7a22ef21.paper (accessed March 2016); **Horton S, Steckel RH,** Malnutrition. Global economic losses attributable to malnutrition 1900–2000 and projections to 2050. In: B Lomborg, ed. How much have global problems cost the earth? A scorecard from 1900 to 2050. New York: Cambridge University Press, 2013.

30. Sonntag D, Ali S, De Bock F. Lifetime indirect cost of childhood overweight and obesity: A decision analytic model. Obesity, 2016. 24(1): 200-6.

31. Su W, Huang J, Chen F et al. Modeling the clinical and economic implications of obesity using microsimulation. Journal of Medical Economics, 2015. 18(11), 886-97.

32. Liu X, Zhu C. Will Knowing Diabetes Affect Labor Income? Evidence from a Natural Experiment. Economics Letters, 2014. 124(1): 74-78.

33. (GloPAN). Food systems and diets: Facing the challenges of the 21st century. London, UK: (GloPAN), 2016.

34. World Health Organization (WHO). Food safety. Fact sheet No 399. version December 2015. Available at: http://www.who.int/mediacentre/factsheets/fs399/en/ (accessed 30 May 2017).

35. Caulfield LE, de Onis M, Blössner M and Black RE. Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles. The American Journal of Clinical Nutrition, 2004. 80(1), 193-8.

36. Unnevehr LJ and Grace D, eds. 2013. Aflatoxins: Finding solutions for improved food safety. 2020 Vision Focus 20. Washington, DC: IFPRI.

37. Neff RA, Kanter R and Vandevijvere S. Reducing food loss and waste while improving the public's health. Health Affairs, 2015. 34(11), 1821-29.

38. Gustavvson J, Cederberg C, Sonesson U et al. Global food losses and food waste. Rome: FAO, 2011.

39. Parfitt J, Barthel M and Macnaughton S. Food waste within food supply chains: quantification and potential for change to 2050. Philosophical Transactions of the Royal Society of London. Biological Sciences, 2010. 365(1554), 3065-81.

40. Gustavvson J, Cederberg C, Sonesson U et al. Global food losses and food waste. Rome: FAO, 2011.

41. Kader A. Increasing food availability by reducing post-harvest losses of fresh produce. Acta Horticulturae, 2005. 682, 2169-75.

42. FAO. Energy-Smart Food for People and Climate. Issue Paper. Rome: FAO, 2011.

43. WHO. The double burden of malnutrition: policy brief. Geneva: WHO, 2017.

44. Jeuland MA, Pattanayak SK. Benefits and costs of improved cookstoves: assessing the implications of variability in health, forest and climate impacts. PLoS One, 2012. 7(2): e30338.

45. **Bentley A, Das S, Alcock G et al.** Malnutrition and infant and young child feeding in informal settlements in Mumbai, India: findings from a census. Food Science & Nutrition, 2015. 3(3), 257-71; **Singh A, Gupta V, Ghosh A et al.** Quantitative estimates of dietary intake with special emphasis on snacking pattern and nutritional status of free living adults in urban slums of Delhi: impact of nutrition transition. BMC nutrition, 2015. 1(1), 22; **Demilew YM, Tafere TE and Abitew DB.** Infant and young child feeding practice among mothers with 0–24 months old children in Slum areas of Bahir Dar City, Ethiopia. International Breastfeeding Journal, 2017. 12(1), 26.

46. **Hunter-Adams J, Yongsi BN, Dzasi K et al.** How to address non-communicable diseases in urban Africa. The Lancet Diabetes & Endocrinology, 2017; **Khusun H and Fahmida U.** Dietary patterns of obese and normal-weight women of reproductive age in urban slum areas in Central Jakarta. British Journal of Nutrition, 2016. 116(S1), S49-S56; **Gupta V, Downs SM, Ghosh-Jerath S et al.** Unhealthy fat in street and snack foods in low-socioeconomic settings in India: a case study of the food environments of rural villages and an urban slum. Journal of Nutrition Education and Behavior, 2016. 48(4), 269-79.

47. **Ruel M, Garrett J, Yosef S.** Food Security and Nutrition: Growing Cities, New Challenges. Global Food Policy Report 2017. Washington, DC: IFPRI, 2017; and **Hawkes C, Harris J and Gillespie S**, Changing diets: urbanization and the nutrition transition. Global Food Policy Report 2017. Washington, DC: IFPRI, 2017.

48. UN Department of Economic and Social Affairs (Population Division). World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER.A/352). New York: UN Department of Economic and Social Affairs, 2014.

49. IPES-Food. What makes urban food policy happen? Insights from five case studies, 2017. International Panel of Experts on Sustainable Food Systems. Available at: http://www.ipes-food.org/images/Reports/Cities_full.pdf (accessed 13 September 2017).

50. WHO and United Nations Children's Fund (UNICEF). Progress on Sanitation and Drinking Water: 2015 update and MDG assessment. Joint Monitoring Programme (JMP), 2015. Geneva: WHO and New York: UNICEF.

51. Prüss-Üstün A, Bos R, Gore F and Bartram J. Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. Geneva: WHO, 2008.

52. REACH. Country Diagnostic Report, Bangladesh. REACH Working Paper 1. Oxford, UK: University of Oxford, 2015.

53. Kingdom of Cambodia Council for Agricultural and Rural Development. National Strategy for Food Security and Nutrition (2014-2018), 2014. Available at: http://foodsecurity.gov.kh/assets/uploads/media/_20160707_093107_.pdf (accessed 7 September 2017).

54. WaterAid Cambodia. Study on WASH-Nutrition barriers and potential solutions, 2016. Available at: http://www.wateraid.org/~/media/Publications/WA-Cambodia-study-on-WaSH-nutrition-barriers-solutions.pdf (accessed 7 September 2017).

55. World Bank. Precarious Progress: A Diagnostic on Water, Sanitation, Hygiene, and Poverty in Bangladesh, 2017. WASH Poverty Diagnostic. Washington, DC: World Bank.

56. Grantham-McGregor S, Cheung YB, Cueto S et al. Development potential in the first 5 years of children in developing countries. The Lancet, 2007. 369(9555), 60-70.

57. UNICEF. Improving Child Nutrition: The achievable imperative for global progress, 2013.

58. WHO. Childhood Stunting: A Global Perspective. Maternal and Child Nutrition, 2016. 12, 12-26.

59. National Institute of Statistics, Directorate General for Health and ICF International. Cambodia Demographic and Health Survey 2014, 2015. Phnom Penh, Cambodia and Rockville, Maryland, US.

60. National Institute of Statistics. Cambodia Socio-Economic Survey 2014, 2015. Phnom Penh, Cambodia and Rockville, Maryland, US.

61. 65% in 2014.

62. Prak S, Dahl MI, Oeurn S et al. Breastfeeding trends in Cambodia, and the increased use of breastmilk substitute – why is it a danger? Nutrients, 2014. 6(7), 2920-30.

63. National Institute of Statistics. Cambodia Socio-Economic Survey 2014, 2015. Phnom Penh, Cambodia and Rockville, Maryland, US.

64. Kingdom of Cambodia Council for Agricultural and Rural Development National Strategy for Food Security and Nutrition (2014-2018), 2014. Available at: http://foodsecurity.gov.kh/assets/uploads/media/_20160707_093107_.pdf (accessed 7 September 2017).

65. WaterAid Cambodia 2016. Study on WASH-Nutrition barriers and potential solutions. Available at: http://www.wateraid.org/~/media/Publications/WA-Cambodia-study-on-WaSH-nutrition-barriers-solutions.pdf (accessed 7 September 2017).

66. International Council for Science. A guide to SDG interactions: From science to implementation, ed. M Nilsson et al., 2017, Paris: International Council for Science.

67. Black RE, Allen LH, Bhutta ZA et al and Maternal and Child Undernutrition Study Group. Maternal and child undernutrition: global and regional exposures and health consequences. The Lancet, 2008. 371(9608), 243-60.

68. UNICEF. The State of the World's Children 2013. Children with Disabilities. New York: UNICEF, 2013.

69. Black RE, Levin C, Walker N et al. Reproductive, maternal, newborn, and child health: key messages from Disease Control Priorities 3rd Edition. The Lancet, 2016. 388(10061): 2811-24.

70. **Kothari M.** Global Nutrition Report 2016 Supplementary Dataset. Demographic and Health Survey intervention coverage data: percentage of children and pregnant women who received various essential nutrition interventions as reported in the DHS surveys conducted between 2000–2015. Washington DC, 2016; **UNICEF** global databases 2016 based on Multiple Indicator Cluster Surveys, Demographic and Health Surveys and other nationally representative surveys. Available at: http://data.unicef.org (accessed 1 July 2017).

71. WHO. e-Library of Evidence for Nutrition Actions (eLENA), available at: http://www.who.int/elena

72. Bhutta ZA, Das JK, Rizvi A et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet, 2013. 382(9890), 452–77.

73. Watkins D, Nugent R. Setting priorities to address cardiovascular diseases through universal health coverage in low- and middle-income countries. Heart Asia, 2017.

74. **Prabhakar et al** (forthcoming), Disease Control Priorities, third edition, volume 5, The Lancet, 2018; **World Bank** Universal Health Coverage Study Series (UNICO), 2016. Available at: http://www.worldbank.org/en/topic/health/publication/universal-health-coverage-study-series (accessed 1 July 2017).

75. WHO. Noncommunicable Diseases Progress Monitor. Geneva: WHO, 2015.

76. World Bank. Universal Health Coverage Study Series (UNICO), 2016. Available at: http://www.worldbank.org/en/topic/health/publication/universal-health-coverage-study-series (accessed 1 July 2017).

77. Gaziano TA, Abrahams-Gessel S, Denman CA et al. An assessment of community health workers' ability to screen for cardiovascular disease risk with a simple, non-invasive risk assessment instrument in Bangladesh, Guatemala, Mexico, and South Africa: an observational study. The Lancet Global Health, 2015. 3:e556-63.

78. Chan HS, Knight C, Nicholson M. Association between dietary intake and 'school-valued' outcomes: a scoping review. Health Education Research, 2017. 32(1), 48-57.

79. **Jukes M et al.** Nutrition and Education. Brief No. 2 of Nutrition: A Foundation for Development. Geneva, Switzerland: UN Standing Committee on Nutrition; **Maluccio J et al.** 2009. The impact of improving nutrition during early childhood on education among Guatemalan adults, Economic Journal, 119 (537), 734-763; and **WHO 2013.** Is it true that lack of iodine really causes brain damage? WHO Health Topics Q&A, updated May 2013. Available at: http://www.who.int/features/qa/17/en/.

80. **Chan HS, Knight C, Nicholson M.** Association between dietary intake and 'school-valued' outcomes: a scoping review. Health Education Research, 2017. 32(1), 48-57; **Henriksson P, Cuenca-García M, Labayen I et al.** Diet quality and attention capacity in European adolescents: the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) study. The British Journal of Nutrition, 2017. 117(11), 1587-95.

81. Alderman H, Hoddinott J and Kinsey B. Long term consequences of early childhood malnutrition. Oxford Economic Papers, 2006. 58(3), 450-74.

82. **Gates MF.** Putting women and girls at the center of development. Science. 2014. 345(6202), 1273-5; Taukobong HF, Kincaid MM, Levy JK et al. Does addressing gender inequalities and empowering women and girls improve health and development programme outcomes? Health Policy and Planning, 2016. 31(10), 1492-514; and **Patton GC, Sawyer SM, Santelli JS et al.** Our future: A Lancet commission on adolescent health and wellbeing. The Lancet. 2016. 387(10036), 2423-78.

83. Alderman H, Headey DD. How Important is Parental Education for Child Nutrition? World Development, 2017. 30(94): 448-64.

84. UNICEF. Primary Education Current Status and Progress: Gender Equality. September 2016. Available at: https://data.unicef.org/topic/education/primary-education/ (accessed 30 May 2017).

85. International Labour Organization (ILO). C183 – Maternity Protection Convention (No. 183). Geneva: ILO, 2000.

86. International Labour Organization. Maternity and paternity at work: law and practice across the world. Geneva: ILO, 2014.

87. WHO. Global Strategy for Infant and Young Child Feeding. Geneva: WHO, 2003.

88. Victora CG, Bahl R, Barros AJD et al. Breastfeeding in the 21st Century: Epidemiology, Mechanisms, and Lifelong Effect. The Lancet, 2016. 387(10017), 475-90.

89. See for example Sraboni E, Malapit HJ, Quisumbing AR and Ahmed AU. Women's Empowerment in Agriculture: What Role for Food Security in Bangladesh? World Development, 2014. 61: 11-52.

90. Healthy Eating Advisory Service. Available at: http://heas.health.vic.gov.au/healthy-choices/guidelines (accessed 7 September 2017).

91. Healthy Eating Advisory Service. Available at: http://heas.health.vic.gov.au/healthy-choices/case-studies/alfred-health

92. Healthy Eating Advisory Service. Available at: http://heas.health.vic.gov.au/healthy-choices/case-studies/alfred-health-sugary-drink-trials

93. Huse O, Blake MR, Brooks R et al. The effect on drink sales of removal of unhealthy drinks from display in a self-service café. Public Health Nutrition, 2016. 19(17), 3142-5.

94. Development Initiatives. P20 Initiative: Baseline report. Bristol, UK: Development Initiatives, 2017. Available at: http://devinit.org/post/p20-initiative-data-to-leave-no-one-behind/# (accessed 2 September 2017).

95. Richter LM, Daelmans B, Lombardi J et al. Investing in the foundation of sustainable development: pathways to scale up for early childhood development. The Lancet. 2017. 389(10064), 103-18.

96. Grantham-McGregor S, Cheung YB, Cueto S et al. Developmental potential in the first 5 years for children in developing countries. The Lancet, 2007. 369(9555): 60-70.

97. Horton S, Steckel RH. Malnutrition. Global economic losses attributable to malnutrition 1900–2000 and projections to 2050. In: B Lomborg, ed. How much have global problems cost the earth? A scorecard from 1900 to 2050. New York: Cambridge University Press, 2013.

98. Hoddinott J, Maluccio JA, Behrman JR et al. Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. The Lancet, 2008. 371(9610): 411-6.

99. Webb P, Block S. Support for agriculture during economic transformation: Impacts on poverty and undernutrition. Proceedings of the National Academy of Sciences, 2012. 109(31): 12310.

100. **Devaux M, Sassi F, Church J et al.** Exploring the Relationship Between Education and Obesity. OECD Journal: Economic Studies, 2011. 1. Available at: http://dx.doi.org/10.1787/eco_studies-2011-5kg5825v1k23 (accessed 7 September 2017); **Australian Institute of Health and Welfare.** Impact of overweight and obesity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no.11. Cat. no. BOD 12. Canberra: Australian Institute for Health, 2017; **WHO Regional Office for Europe.** Adolescent obesity and related behaviours: trends and inequalities in the WHO European Region, 2002–2014. Copenhagen: WHO Regional Office for Europe, 2017.

101. **Di Cesare M, Khang YH, Asaria P et al.** Inequalities in non-communicable diseases and effective responses. The Lancet. 2013. 381(9866), 585-97; **Monteiro CA, Conde WL, Lu B and Popkin BM.** Obesity and inequities in health in the developing world. International Journal of Obesity and Related Metabolic Disorders: Journal of the International Association for the Study of Obesity. 2004. 28(9), 1181-6; **McLaren L.** Socioeconomic Status and Obesity. Epidemiologic reviews. 2007; 29, 29-48.

102. **Jones-Smith JC, Gordon-Larsen P, Siddiqi A and Popkin BM.** Is the burden of overweight shifting to the poor across the globe? Time trends among women in 39 low- and middle-income countries (1991-2008). International Journal of Obesity, 2012. 36: 1114-20; **Jones-Smith JC, Gordon-Larsen P, Siddiqi A and Popkin BM.** Cross-national comparisons of time trends in overweight inequality by socioeconomic status among women using repeated cross-sectional surveys from 37 developing countries, 1989-2007. American Journal of Epidemiology, 2011; 173: 667-75.

103. Allen L, Williams J, Townsend N et al. Socioeconomic status and non-communicable disease behavioural risk factors in low-income and lower-middle-income countries: a systematic review. The Lancet Global Health, 2017. 5(3), e277-e289.

104. Webb P, Block S. Support for agriculture during economic transformation: Impacts on poverty and undernutrition. Proceedings of the National Academy of Sciences, 2012. 109(31): 12309-14.

105. FAO. Voices of the Hungry. See: http://www.fao.org/in-action/voices-of-the-hungry/en

106. **Ghattas H.** Food security and nutrition in the context of the nutrition transition. Technical Paper. FAO, Rome, 2014; **Food Research and Action Center.** Understanding the Connections: Food Insecurity and Obesity, 2015. Available at: http://frac.org/wp-content/uploads/frac_brief_understanding_the_connections.pdf (accessed 7 September 2017).

107. FAO. Voices of the Hungry. See: http://www.fao.org/in-action/voices-of-the-hungry/en

108. Messer E, Cohen MJ, Marchione T. Conflict: A Cause and Effect of Hunger. Environmental Change and Security Project Report Issue No. 7 of the Woodrow Wilson International Center for Scholars, 2001.

109. Messer E, Cohen MJ, Marchione T. Conflict: A Cause and Effect of Hunger. Environmental Change and Security Project Report Issue No. 7 of the Woodrow Wilson International Center for Scholars, 2001.

110. **Messer E.** Rising food prices, social mobilizations, and violence: Conceptual issues in understanding and responding to the connections linking hunger and conflict. Annals of Anthropological Practice, 2009. 32(1): 12-22; **Lagi M, Bertrand KZ, Yaneer BM.** The Food Crises and Political Instability in North Africa and the Middle East. Cambridge, MA: New England Complex Systems Institute, 2011.

111. ACAPS. Famine Northeast Nigeria, Somalia, South Sudan, and Yemen: Final Report. Geneva: Assessment Capacities Project (ACAPS), 2017.

112. **De Waal A.** Armed Conflict and the Challenge of Hunger: Is an End in Sight? Global Hunger Index 2015. Washington, DC: IFPRI, 2015; **OECD.** Principles for good international engagement in fragile states and situations. Paris: OECD, 2007; **FAO, International Fund for Agricultural Development.** Food insecurity in protracted crises: An overview. Report of a High Level Expert Forum on Food Insecurity in Protracted Crises Rome: FAO and IFAD, 2012; **Brinkman H and Hendrix C.** Food insecurity and violent conflict: Causes, consequences, and addressing the challenges. World Food Programme, 2011.

113. FAO. Peace and Food Security: Investing in resilience to sustain rural livelihoods and conflict. FAO: Rome, 2016.

114. Quinn J, Zeleny T, Bencko V. Food Is Security: The Nexus of Health Security in Fragile and Failed States. Food and Nutrition Sciences, 2014. 5(19): 1828.

115. Pinstrup-Andersen P, Shimokawa S. Do poverty and poor health and nutrition increase the risk of armed conflict onset? Food Policy, 2008. 33(6): 513-20.

116. IFPRI. 2014–2015 Global Food Policy Report. Washington, DC: IFPRI, 2015.

117. Grijalva-Eternod CS, Wells JC, Cortina-Borja M et al. The double burden of obesity and malnutrition in a protracted emergency setting: a cross-sectional study of Western Sahara refugees. PLoS Medicine, 2012 9(10), e1001320.

118. **Brinkman H and Hendrix C.** Food insecurity and violent conflict: Causes, consequences, and addressing the challenges. World Food Programme, 2011; **Quinn J, Zeleny T and Bencko V.** Food is security: the nexus of health security in fragile and failed states. Food and Nutrition Sciences, 2014, 5: 1828-42; and **Hendrix CS.** When Hunger Strikes: How Food Security Abroad Matters for National Security at Home. The Chicago Council on Global Affairs: Chicago, Illinois, 2016.

119. Breisinger C, Ecker O and Trinh Tan JF. How Do We Break the Links? In 2014–2015 Global Food Policy Report. Washington, DC: International Food Policy Research Institute (IFPRI). Available at: http://dx.doi.org/10.2499/9780896295759.

120. IFPRI. Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016, page 5.

121. High-Level Political Forum on Sustainable Development. 2017 HLPF Thematic review of SDG2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture, 2017. Available at: https://sustainabledevelopment.un.org/content/documents/14371SDG2_format.revised_FINAL_28_04.pdf (accessed 28 May 2017).

Chapter 4

1. Buse K, Hawkes S. Health in the sustainable development goals: ready for a paradigm shift? Globalization and Health, 2015. 11(1): 13.

2. International Food Policy Research Institute (IFPRI). Global Nutrition Report 2016. From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: IFPRI, 2016.

3. This section on investments was prepared by the SUN Secretariat, led by Patrizia Fracassi and William Knechtel. The data is based on the national budget analysis conducted by country teams. This analytical exercise is country-led and voluntary. The methodology builds on work done with Clara Picanyol, Robert Greener, Amanda Pomeroy, Mary D'Alimonte, Richard Watts, Aurora Gary and Komal Bhatia.

4. World Bank (Shekar M, Kakietek J, Dayton Eberwein J, Walters D). An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development – Human Development. Washington, DC: World Bank, 2017.

5. This analysis excludes the state of Maharashtra (India), Liberia, Ivory Coast and Niger because of issues with the general government expenditure.

6. The Investment Framework for Nutrition provides unit costs of interventions to meet the targets and estimates of government spending on nutrition programmes from various sources (Shekar et al 2017). Most importantly, the framework clearly identifies which interventions are included in the estimates. For full source: World Bank Group (Shekar M, Kakietek J, Eberwein JD, Walters D et al). An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development. Washington, DC: World Bank, 2017. doi:10.1596/978-1-4648-1010-7. Available at: https://tinyurl.com/InvestmentFrameworkNutrition (accessed 17 August 2017).

7. The analysis is based on World Bank Group (Shekar M, Kakietek J, Eberwein JD, Walters D et al). An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development. Washington, DC: World Bank, 2017. doi:10.1596/978-1-4648-1010-7. Available at: https://tinyurl.com/InvestmentFrameworkNutrition (accessed 17 August 2017).

8. The 17% allocated to nutrition from agriculture is relative to other sectors and not to the agriculture budget. The following typologies of programmes were considered: food security, agriculture services, food safety, rural development, livestock, fishery and non-staple (including fruits and vegetables) production. These are aligned with Creditor Reporting System coding and with what the Food and Agriculture Organization has used to develop its own methodology.

9. This section was prepared by Jordan Beecher, Development Initiatives.

10. OECD Development Assistance Committee (DAC). Purpose Codes: sector classification. Available at: http://www.oecd.org/dac/stats/purposecodessectorclassification.htm (accessed 11 September 2017)

11. D'Alimonte M, Heung S and Hwang C. Tracking Funding for Nutrition: Improving how aid for nutrition is reported and monitored. Results for Development, 2016. Available at: http://www.r4d.org/wp-content/uploads/R4D_TrackingAid4Nutrition-final.pdf (accessed 15 August 2017).

12. **OECD.** First-Ever Comprehensive Data on Aid for Climate Change Adaptation. 2011. Available at: https://www.oecd.org/dac/stats/49187939.pdf (accessed 15 August 2017); **OECD.** Statistics on resource flows to developing countries. 2015. Available at: http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm (accessed 15 August 2017).

13. OECD DAC Working Party on Development Finance Statistics. Adjusting purpose codes and policy markers in light of the SDGs: Proposal on noncommunicable diseases, 2017, page 5. Available at: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DCD/DAC/STAT(2017)17&docLanguage=En (accessed 30 August 2017).

14. World Bank Group (Shekar M, Kakietek J, Eberwein JD, Walters D et al). An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development. Washington, DC: World Bank, 2017. doi:10.1596/978-1-4648-1010-7. Available at: https://tinyurl.com/InvestmentFrameworkNutrition, (accessed 17 August 2017).

15. DAC countries can be found at: http://www.oecd.org/dac/dacmembers.htm

16. Using currency exchange rates from the Internal Revenue Service: https://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates

17. UN. Addis Ababa Action Agenda of the Third International Conference on Financing for Development, 2015. Available at: http://www.un.org/esa/ffd/wp-content/uploads/2015/08/AAAA_Outcome.pdf (accessed 30 August 2017).

18. World Health Organization (WHO). Taxes on sugary drinks: Why do it? 2016. Available at: http://apps.who.int/iris/bitstream/10665/250303/1/WHO-NMH-PND-16.5-eng.pdf (accessed 30 August 2017).

19. 'Development assistance' refers here to the resources transferred from development agencies (including private philanthropic organisations) to low and middle-income countries, and is therefore wider than 'official development assistance/ODA' which refers to assistance from OECD DAC members only.

20. Institute for Health Metrics and Evaluation (IHME). Financing Global Health 2016: Development Assistance, Public and Private Health Spending for the Pursuit of Universal Health Coverage. Seattle, Washington: IHME, 2017.

21. Bloomberg Philanthropies. Obesity prevention: Supporting strong policies to halt rising rates of obesity, 2017. Available at: https://www.bloomberg.org/program/public-health/obesity-prevention/ (accessed 15 August 2017).

22. World Bank Group (Shekar M, Kakietek J, Eberwein JD, Walters D et al). An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting. Directions in Development. Washington, DC: World Bank, 2017. doi:10.1596/978-1-4648-1010-7. Available at: https://tinyurl.com/InvestmentFrameworkNutrition, (accessed 17 August 2017).

23. **Cochero MA, Popkin BM, Rivera JA, Ng SW**. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. The BMJ, 2016. 352: h6704; **Cochero MA, Rivera-Dommarco J, Popkin BM, Ng SW**. In Mexico, evidence of sustained consumer response two years after implementing a sugar-Sweetened beverage tax. Health Affairs, 2017. 10-377.

24. WHO. WHO Global Coordination Mechanism on the Prevention and Control of Noncommunicable Diseases, 2016. Available at: http://www.who.int/global-coordination-mechanism/working-groups/final_5_1with_annexes6may16.pdf?ua=1 (accessed 30 August 2017).

25. OECD. Development Co-operation Report 2014: Mobilising Resources for Sustainable Development. OECD Publishing. Available at: http://dx.doi.org/10.1787/dcr-2014-en (accessed 30 August 2017).

Chapter 5

1. UK government. Nutrition for Growth Commitments: Executive Summary. 2013. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207274/nutrition-for-growth-commitments.pdf (accessed 28 May 2017).

2. For more information on the N4G commitments, refer to the 2014, 2015 and 2016 Global Nutrition Reports. Panel 4.1 (page 34) in the 2016 report details the types of commitments made by each stakeholder.

3. As many commitments are not reported on, this may hide progress that would be assessed as off course or not clear.

4. Global Nutrition Report website, 2017. Available at: http://www.globalnutritionreport.org/.

5. These figures are self-reported by donors. Donor figures in this chapter come from the OECD Development Assistance Committee (DAC) database. Thus, there may be some discrepancies between self-reporting and DAC figures.

6. For further analysis of nutrition-specific and nutrition-sensitive donor investments, see Chapter 4.

7. UK government. Nutrition for Growth Commitments: Executive Summary. 2013. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207274/nutrition-for-growth-commitments.pdf (accessed 28 May 2017).

8. See: www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates (accessed 17 August 2017).

9. European Commission (ICF International). Monitoring the activities of the EU Platform for Action on Diet, Physical Activity and Health: Annual Report 2016. Version May 2016. 2016. Available at: http://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/2016_report_en.pdf (accessed 28 May 2017).

10. International Food Policy Research Institute (IFPRI). Global Nutrition Report. How to Make SMART Commitments to Nutrition Action. Version March 2016. Available at: http://www.globalnutritionreport.org/files/2016/03/SMART-guideline-GNR-2016.pdf (accessed 28 May 2017).

11. IFPRI. Global Nutrition Report. How to Make SMART Commitments to Nutrition Action. Version March 2016. Available at: http://www.globalnutritionreport.org/files/2016/03/SMART-guideline-GNR-2016.pdf (accessed 28 May 2017).

12. World Cancer Research Fund International/NCD Alliance. Ambitious, SMART commitments to address NCDs, overweight and obesity. World Cancer Research Fund International/NCD Alliance, 2016.

13. ICF Consulting Services. Monitoring the Activities of the EU Platform for Action on Diet, Physical Activity and Health: Annual Report 2016 and Annexes 1-3. ICF, 2016. Available at http://ec.europa.eu/health/sites/health/files/nutrition_physical_activity/docs/2016_report_en.pdf and https://ec.europa.eu/health//sites/health/files/nutrition_physical_activity/docs/2016_report_annex1_en.pdf.

14. Lofthouse J. Maximising the Quality of Scaling Up Nutrition Plus (MQSUN+) Report. Forthcoming, 2017.

15. Lofthouse J. Maximising the Quality of Scaling Up Nutrition Plus (MQSUN+) Report. Forthcoming, 2017.

16. **Lofthouse J.** Maximising the Quality of Scaling Up Nutrition Plus (MQSUN+) Report. Forthcoming, 2017; Baker. Forthcoming. Reference pending, 2017; **Pelletier DL, Frongillo EA, Gervais S et al.** Nutrition agenda setting, policy formulation and implementation: Lessons from the Mainstreaming Nutrition Initiative. Health Policy and Planning, 2012. 27(1): 19-31; **te Lintelo DJH, Lakshman RWD.** Equate and Conflate: Political Commitment to Hunger and Undernutrition Reduction in Five High-Burden Countries. World Development, 2015. 76: 280-92.

17. **Pelletier DL, Frongillo EA, Gervais S et al.** Nutrition agenda setting, policy formulation and implementation: Lessons from the Mainstreaming Nutrition Initiative. Health Policy and Planning, 2012. 27(1): 19-31; **te Lintelo DJH, Lakshman RWD.** Equate and Conflate: Political Commitment to Hunger and Undernutrition Reduction in Five High-Burden Countries. World Development, 2015. 76: 280-92; **Hoey L, Pelletier DL.** Bolivia's multisectoral Zero Malnutrition Program: Insights on commitment, collaboration, and capacities. Food and Nutrition Bulletin, 2011. 32(suppl 2): s70-s81.

18. **Hoey L, Pelletier DL.** Bolivia's multisectoral Zero Malnutrition Program: Insights on commitment, collaboration, and capacities. Food and Nutrition Bulletin, 2011. 32(suppl 2): s70-s81; **Gillespie S, Haddad L, Mannar V et al.** The politics of reducing malnutrition: building commitment and accelerating progress. The Lancet, 2013. 382(9891): 552-69; **Fox AM, Balarajan Y, Cheng C, Reich MR.** Measuring political commitment and opportunities to advance food and nutrition security: Piloting a rapid assessment tool. Health Policy and Planning, 2015. 30(5): 566-78; **World Bank (Heaver R).** Strengthening Country Commitment to Human Development: Lessons from Nutrition. Directions in Development. 2005, Washington, DC: World Bank.

19. **Hoey L, Pelletier DL.** Bolivia's multisectoral Zero Malnutrition Program: Insights on commitment, collaboration, and capacities. Food and Nutrition Bulletin, 2011. 32(suppl 2): s70-s81; **Levinson FJ, Balarajan Y, Marini A.** Addressing malnutrition multisectorally: What have we learned from recent international experience. New York: UNICEF and MDG Achievement Fund, 2013; **Shiffman J, Smith S.** Generation of political priority for global health initiatives: a framework and case study of maternal mortality. The Lancet, 2007. 370(9595): 1370-9; **Hawkes C, Ahern AL, Jebb SA.** A stakeholder analysis of the perceived outcomes of developing and implementing England's obesity strategy 2008–2011. BMC Public Health, 2014. 14(1): 1.

20. **Hoey L, Pelletier DL.** Bolivia's multisectoral Zero Malnutrition Program: Insights on commitment, collaboration, and capacities. Food and Nutrition Bulletin, 2011. 32(suppl 2): s70-s81; **Mejía Acosta A, Fanzo J.** Fighting Maternal and Child Malnutrition: Analysing the political and institutional determinants of delivering a national multisectoral response in six countries. Brighton, UK: Institute of Development Studies, 2012; **Mejía Acosta A, Haddad L.** The politics of success in the fight against malnutrition in Peru. Food Policy, 2014. 44: 26-35.

21. **Levinson FJ, Balarajan Y, Marini A.** Addressing malnutrition multisectorally: What have we learned from recent international experience. New York: UNICEF and MDG Achievement Fund, 2013; **Meija-Costa A, Fanzo J.** Fighting Maternal and Child Malnutrition: Analysing the political and institutional determinants of delivering a national multisectoral response in six countries. Brighton, UK: Institute of Development Studies, 2012.

22. **Pelletier DL, Frongillo EA, Gervais S et al.** Nutrition agenda setting, policy formulation and implementation: Lessons from the Mainstreaming Nutrition Initiative. Health Policy and Planning, 2012. 27(1): 19-31; **World Bank (Heaver R).** Strengthening Country Commitment to Human Development: Lessons from Nutrition. Directions in Development. 2005, Washington, DC: World Bank.

23. **Pelletier DL, Frongillo EA, Gervais S et al.** Nutrition agenda setting, policy formulation and implementation: Lessons from the Mainstreaming Nutrition Initiative. Health Policy and Planning, 2012. 27(1): 19-31; **te Lintelo DJH, Lakshman RWD.** Equate and Conflate: Political Commitment to Hunger and Undernutrition Reduction in Five High-Burden Countries. World Development, 2015. 76: 280-92; **World Bank (Heaver R).** Strengthening Country Commitment to Human Development: Lessons from Nutrition. Directions in Development. 2005, Washington, DC: World Bank.

24. Levinson FJ, Balarajan Y, Marini A. Addressing malnutrition multisectorally: What have we learned from recent international experience. New York: UNICEF and MDG Achievement Fund, 2013.

25. **Levinson FJ, Balarajan Y, Marini A.** Addressing malnutrition multisectorally: What have we learned from recent international experience. New York: UNICEF and MDG Achievement Fund, 2013; **Meija-Costa A, Fanzo J.** Fighting Maternal and Child Malnutrition: Analysing the political and institutional determinants of delivering a national multisectoral response in six countries. Brighton, UK: Institute of Development Studies, 2012; **Pelletier DL, Menon P, Ngo T.** The nutrition policy process: The role of strategic capacity in advancing national nutrition agendas. Food and Nutrition Bulletin, 2011. 32 (suppl 2): s59-s69.

Chapter 6

1. Tran, M. The Guardian Poverty matters blog: Millennium development goals summit live updates, 2010. Available at: https://www.theguardian.com/global-development/poverty-matters/2010/sep/20/un-mdg-summit-2010-millennium-development-goals (accessed 7 September 2017).

Appendix 1

1. United Nations Children's Fund (UNICEF), World Health Organization (WHO) and World Bank Group. UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates 2017. Levels and Trends in Child Malnutrition. Key findings of the 2017 edition. 2017. Available at: http://www.who.int/nutgrowthdb/estimates/en/ (accessed 15 August 2017).
2. For a detailed and thorough discussion of the methodology for monitoring progress towards the global MIYCN targets for 2025, see WHO, UNICEF for the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring. Methodology for monitoring progress towards the global nutrition targets for 2025: Technical report. Geneva: WHO, UNICEF: New York, 2017.
3. WHO, UNICEF, for the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring. Methodology for monitoring progress towards the global nutrition targets for 2025: Technical report. Geneva: WHO, UNICEF: New York, 2017.
4. WHO. WHO Global Targets 2025 Tracking Tool (version 3 – May 2017): Global Progress Report, 2017. Available at: http://www.who.int/nutrition/trackingtool/en/ (accessed 30 June 2017).
5. WHO, UNICEF, for the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring. Methodology for monitoring progress towards the global nutrition targets for 2025: Technical report. Geneva: WHO, UNICEF: New York, 2017.
6. WHO. NCD Global Monitoring Framework. 2017. Available at: http://www.who.int/nmh/global_monitoring_framework/en/ (accessed 1 July 2017).
7. WHO. Global Status Report on Non-Communicable Diseases 2014. Geneva: World Health Organisation, 2014.
8. **WHO.** Global Status Report on Non-Communicable Diseases 2014. Geneva: World Health Organisation, 2014; **NCD Risk Factor Collaboration (NCD-RisC).** Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017); **WHO.** Global Health Observatory data repository: Raised fasting blood glucose (≥7.0 mmol/L or on medication). Data by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A869?lang=en; Raised blood pressure (SBP ≥140 OR DBP ≥90), age-standardized (%). Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A875STANDARD?lang=en; Prevalence of obesity among adults, BMI ≥ 30, age-standardized. Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A900A?lang=en; Prevalence of overweight among adults, BMI ≥ 25, age-standardized. Estimates by country, 2017. Available at: http://apps.who.int/gho/data/node.main.A897A?lang=en (all accessed 1 May 2017).
9. **NCD-RisC.** Worldwide trends in diabetes since 1980: a pooled analysis of 751 population-based studies with 4.4 million participants. The Lancet, 2016. 387(10027): 1513-30; **NCD-RisC.** Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. The Lancet, 2016. 387(10026): 1377-96.
10. **Mozaffarian D, Fahimi S, Singh GM et al.** Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 2014. 371(7): 624-34; **Powles J, Fahimi S, Micha R et al.** Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open, 2013. 3(12).
11. **WHO.** Global Status Report on Non-Communicable Diseases 2014. Geneva: WHO, 2014; **Powles J, Fahimi S, Micha R et al.** Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. BMJ Open, 2013. 3(12).
12. WHO. Guideline: Sodium Intakes for Adults and Children. Geneva: WHO, 2012.
13. Mozaffarian D, Fahimi S, Singh GM et al. Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 2014. 371(7): 624-34.
14. WHO. Global Status Report on Non-Communicable Diseases 2014. Geneva: World Health Organisation, 2014.
15. NCD-RisC. Data downloads. 2017. Available at: http://www.ncdrisc.org/data-downloads.html (accessed 1 May 2017).

Appendix 2

1. **Kothari M.** Global Nutrition Report 2016 Supplementary Dataset. Demographic and Health Survey intervention coverage data: percentage of children and pregnant women who received various essential nutrition interventions as reported in the DHS surveys conducted between 2000–2015. Washington DC, 2016; **UNICEF global databases 2016** based on Multiple Indicator Cluster Surveys, Demographic and Health Surveys and other nationally representative surveys. Available at: http://data.unicef.org (accessed 1 July 2017).
2. WHO. e-Library of Evidence for Nutrition Actions (eLENA), available at: http://www.who.int/elena.
3. Bhutta ZA, Das JK, Rizvi A et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet, 2013. 382(9890): 452-77.
4. **Kothari M.** 2016. Global Nutrition Report 2016 Supplementary Dataset: Demographic and Health Survey Intervention Coverage Data: Percentage of Children and Pregnant Women Who Received Various Essential Nutrition Interventions as Reported in the DHS Surveys Conducted between 2005–2015. Washington, DC, February 4; **UNICEF global databases.** www.data.unicef.org (accessed April 2016).

Appendix 3

1. Greener R, Picanyol C, Mujica A et al. Analysis of Nutrition-Sensitive Budget Allocations: Experience from 30 countries. London: Department for International Development, 2016.
2. Greener R, Picanyol C, Mujica A et al. Analysis of Nutrition-Sensitive Budget Allocations: Experience from 30 countries. London: Department for International Development, 2016.

Abbreviations

AARR	Average annual rate of reduction
BMI	Body mass index
CRS	Creditor Reporting System (DAC)
DAC	Development Assistance Committee
DHS	Demographic and Health Surveys
DRC	Democratic Republic of the Congo
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross domestic product
IDA	International Development Association
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
MICS	Multiple Indicator Cluster Survey
MIYCN	Maternal infant and young child nutrition
N4G	Nutrition for Growth
NCD	Non-communicable disease
NCD-RisC	NCD Risk Factor Collaboration
NGO	Non-governmental organisation
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goal
SMART	Specific, measurable, achievable, relevant and time-bound
SUN	Scaling Up Nutrition
TEAM	Technical Expert Advisory Group on Nutrition Monitoring (UNICEF)
UK	United Kingdom
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UN	United Nations
US	United States
WASH	Water, sanitation and hygiene
WHO	World Health Organization

Supplementary online materials

The following supporting materials are available on the Global Nutrition Report website at:

www.globalnutritionreport.org

NUTRITION PROFILES – DATA AVAILABLE FOR OVER 90 INDICATORS

- Global Nutrition Profile
- Regional and sub-regional nutrition profiles (for 6 UN regions and 22 sub-regions)
- Nutrition Country Profiles (for the 193 UN member states)

NUTRITION FOR GROWTH TRACKING TABLES – PROGRESS ON ALL COMMITMENTS MADE

- Country progress
- Business progress
- Civil society organisation progress
- Donor nonfinancial progress
- Other organisations progress
- UN progress

ONLINE APPENDIX

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SPOTLIGHT 1.2: What is 'integration' in the SDGs and what does it mean for nutrition?
Corinna Hawkes

SPOTLIGHT 1.3: Shared causes of different forms of malnutrition
Corinna Hawkes, Alessandro Demaio and Francesco Branca

SPOTLIGHT 2.1: Global Nutrition Report's Nutrition Country Profiles
Komal Bhatia and Tara Shyam

SPOTLIGHT 2.2: Methods to track global and country progress
Komal Bhatia

SPOTLIGHT 2.3: The critical importance of filling data gaps to track nutrition in adolescents
Komal Bhatia

SPOTLIGHT 2.4: Diet quality data gaps
Anna Herforth

SPOTLIGHT 2.5: Launching a nutrition data revolution: What are we waiting for?
Ellen Piwoz, Rahul Rawat, Patrizia Fracassi and David Kim

SPOTLIGHT 3.1: Integrated policy and action on nutrition and water, sanitation and hygiene in Cambodia
Dan Jones and Megan Wilson-Jones

SPOTLIGHT 3.2: Integrating healthy food provision and economic viability in a large metropolitan health service, Australia
Anna Peeters, Kirstan Corben and Tara Boelsen-Robinson

SPOTLIGHT 4.1: The importance of nutrition budget analyses
Alexis D'Agostino, Helen Connolly and Chad Chalker

SPOTLIGHT 4.2: Improving tracking of donor aid for nutrition
Mary D'Alimonte and Augustin Flory

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Neena Prasad and Greg Hallen

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PARTNERS 2017

Ethiopia

Guatemala

Indonesia

Malawi

Nigeria

Pakistan

Senegal CLM

Government of Canada Gouvernement du Canada

Government of the Netherlands

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