02

2008. Mexico.
A man prepares a torta ahogada, a sandwich typical of the Mexican state of Jalisco, in his family-run truck.
© heacphotos

The burden of malnutrition

KEY POINTS

1 Progress to tackle all forms of malnutrition remains unacceptably slow. There has been some progress in reducing childhood stunting – which is gradually declining – but still 150.8 million children are stunted. In addition, 50.5 and 38.3 million children are wasted and overweight respectively, and 2.01 billion adults are overweight and obese.

2 The latest assessment shows that just under 50% of countries are on course to meet at least one of nine global nutrition targets. However, no country is on target to meet all of the nine targets that are being tracked, and just five countries are on track to meet four. No country is on course to meet the adult obesity target. This leaves most of the countries with data off-track.

3 Countries are struggling with multiple forms of malnutrition. Of the 141 countries analysed, 88% (124 countries) experience more than one form of malnutrition, with 29% (41 countries) having high levels of all three forms.

4 Children can also experience multiple forms of malnutrition: 3.62% of children under five (15.95 million children) are both stunted and wasted, while 1.87% of under-fives globally (8.23 million children) experience both stunting and overweight.

5 Geospatial and disaggregated data is helping us understand who is malnourished and where and how to target action at subnational levels.

Introduction

This chapter presents an update on the status of malnutrition in all its forms across the globe – looking at who is affected, where and by what type of malnutrition. Advances in data collection, analysis and use of data in 2017 and 2018 enable us to shed light on the nature of malnutrition as never before. New developments and improvements in data collection and analysis, as well as improvements in subnational disaggregated data, are starting to guide all stakeholders on where action should be taken and what that action should look like. This evidence is helping develop a clear picture of who is nutritionally vulnerable and why.

This chapter presents an overview while more detailed (updated) data at regional and country levels and data on global malnutrition disaggregated by rural and urban locations, wealth and gender, can be found on the Global Nutrition Report website.[1]

Exploring global and regional trends in malnutrition in all its forms

Global trends

As in previous years, the *2018 Global Nutrition Report* finds again that the problem of malnutrition remains severe: the world is not on track to achieve the targets it has set itself. Malnutrition in all its forms remains unacceptably high across all regions of the world.

Despite reductions in stunting, 150.8 million children (22.2%) under five years of age are stunted,[2] 50.5 million children under five are wasted[3] and 20 million newborn babies are estimated to be of low birth weight,[4] while 38.3 million children under five years of age are overweight.[5] Figure 2.1 shows that while there have been reductions in the number of children affected by stunting since 2000, overweight among children under five years of age has increased over time.

Within this gloomy picture, there has been progress made in reducing stunting in children under five years of age – the core focus of political commitment to nutrition for some years. Rates have been slowly but steadily declining with global prevalence falling from 32.6% in 2000 to 22.2% in 2017.[6] For example, since 2000, stunting in Nepal declined from 57.1% to 36.0% and in Lesotho from 52.7% to 33.4%. Regionally, Asia has declined from 38.1% to 23.2%; Latin America and the Caribbean from 16.9% to 9.6%; and Africa from 38.3% to 30.3%. Despite the decrease in stunting prevalence in Africa, the number of stunted children has steadily increased from 50.6 million in 2000 to 58.7 million in 2017. Regionally, South Asia is home to 38.9% of the world's stunted children, having the highest burden of the regions.

FIGURE 2.1

Number of children affected by stunting and overweight, 2000–2017
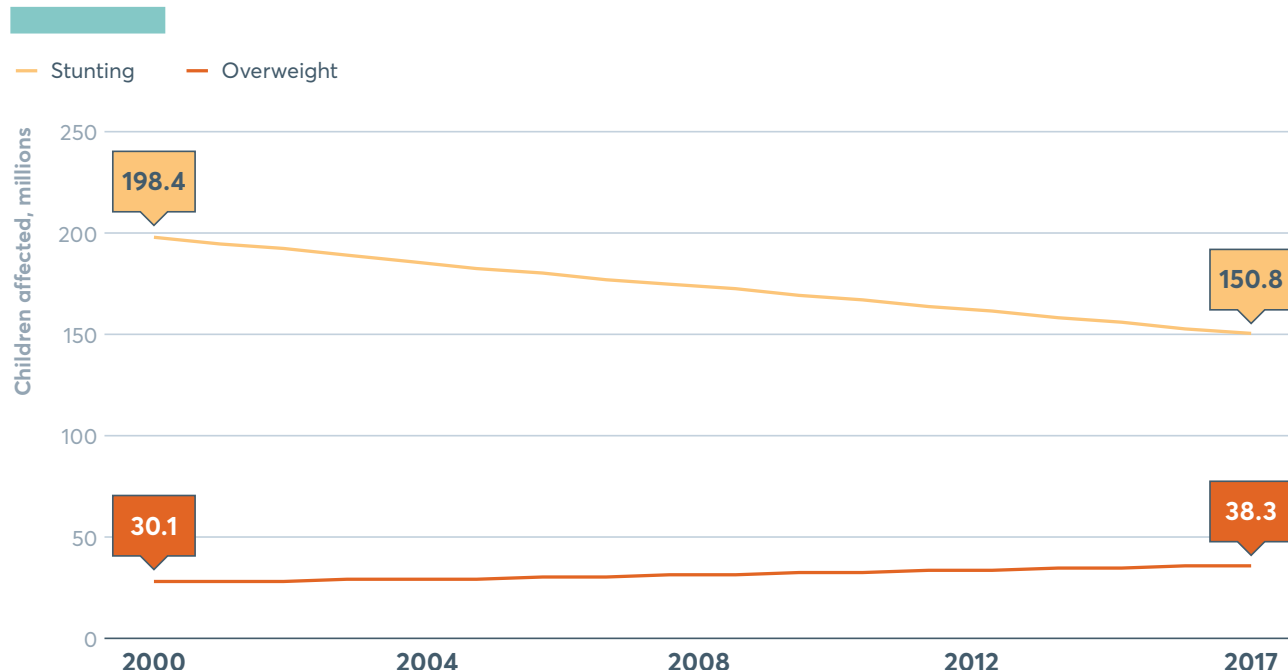
Source: UNICEF/World Health Organization (WHO)/World Bank Group: Joint child malnutrition estimates.

Wasting and stunting are associated with increased mortality, especially when both are present in the same child.[7] Added to this, it is becoming increasingly clear that children who are wasted are more likely to become stunted and children who are stunted are more likely to become wasted.[8] Children who are moderately or severely wasted have a higher risk of mortality.[9,10] Wasting still affects 50.5 million children under five[11] with more than half of the world's wasted children, 26.9 million, living in South Asia.

Of the 38.3 million children who are overweight, 5.4 million and 4.8 million are in South and East Asia respectively – 26.6% of the total.

Anaemia[12] – a problem for adolescent girls and women – appears intractable.[13] Anaemia prevalence in girls and women aged 15 to 49 remains high at 32.8%, increasing from 31.6% in 2000. There are significant differences between pregnant and non-pregnant women. In pregnant women, global prevalence has decreased only slightly from 41.6% in 2000 to 40.1% in 2016. Among women who are not pregnant, it has risen slightly from 31.1% to 32.5% over the same time.[14]

Data on the prevalence of overweight among adults (age ≥18) shows an increase from 35.7% in 2010 to 38.9% in 2016.[15] Obesity prevalence in adults is also on the rise: from 11.2% in 2010 to 13.1% in 2016 (Figure 2.3). In sheer numbers, 2.01 billion adults are overweight (almost a third of adults worldwide) of whom 678 million are obese.[16]

Obesity is a modifiable risk factor of non-communicable diseases (NCDs). The burden of NCDs is significant: an alarming 422 million people have diabetes[17] and 1.1 billion people suffer from high blood pressure.[18] NCDs were responsible for 41 million of the world's 57 million deaths (71%) in 2016, of which diet was one of the four leading risk factors. Burden is greatest in low and middle-income countries, with 78% of all NCD deaths and 85% of premature deaths from NCDs.[19]

FIGURE 2.2
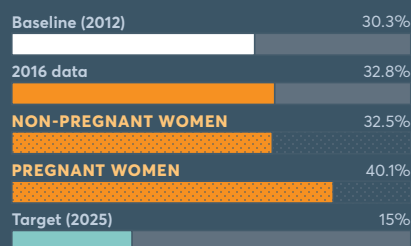Global nutrition: targets, burden and prevalence

Maternal, infant and young child nutrition targets

Anaemia
OFF COURSE

50% reduction of anaemia in women of reproductive age.

|	
Baseline (2012)	30.3%
2016 data	32.8%
NON-PREGNANT WOMEN	32.5%
PREGNANT WOMEN	40.1%
Target (2025)	15%

In 2016, anaemia affected 613.2 million women of reproductive age, 35.3 million of whom were pregnant. Baseline proportion for 2012 was revised to 30.3% in 2017. Current prevalence reflects increase since then.

Low birth weight
DATA NOT AVAILABLE

30% reduction in low birth weight.

Baseline (2008–2012)	15%
Data	Data forthcoming
Target (2025)	10%
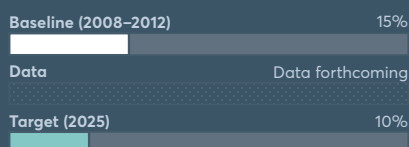
The latest estimate is that there are around 20 million children with low birth weight.

Notes: New estimates from UNICEF are forthcoming.

Exclusive breastfeeding
SOME PROGRESS

Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%.

Baseline (2005–2012)	37%
2013–2018 data	41%
Target (2025)	50% or more

In 2017, 41% of infants 0–5 months were exclusively breastfed. An increase of four percentage points over 5 years reflects very limited progress.

Childhood stunting
OFF COURSE

40% reduction in the number of children under 5 who are stunted.

Baseline (2012)	165.2m
2017 data	150.8m
Target (2025)	Around 100m

In 2017, 150.8 million children were stunted. Current average annual rate of reduction (AARR) (2.3%) below required AARR (3.9%). There will be about 30 million stunted children above the 100 million target of 2025 if current trends continue.

Note: The baseline status has been updated from 162 million children in the *2017 Global Nutrition Report*[20] to 165 million this year.

Childhood overweight
OFF COURSE

No increase in childhood overweight.

Baseline (2012)	5.4%
2017 data	5.6%
Target (2025)	5.4% or less

In 2017, 38.3 million children were overweight. The baseline proportion for 2012 was revised to 5.4% in the estimates for 2017, and the current prevalence is 5.6%.

Childhood wasting
OFF COURSE

Reduce and maintain childhood wasting to less than 5%.

Baseline (2012)	7.9%
2017 data	7.5%
Target (2025)	Less than 5%

In 2017, 50.5 million children were wasted. Global prevalence was 7.5% in 2017, compared with 7.9% in 2012, demonstrating negligible progress towards the 5% target for 2025. A substantial increase in efforts will be required to break the global status of inertia in wasting and lower the rate in the direction of the 5% target by 2025.
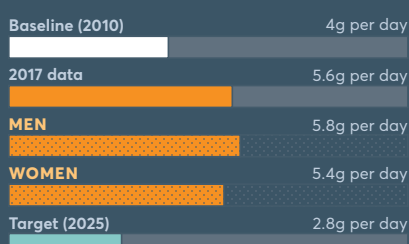
Nutrition-related NCD targets

Salt intake

OFF COURSE

30% relative reduction in mean population intake of salt (sodium chloride).

Baseline (2010)	4g per day
2017 data	5.6g per day
MEN	5.8g per day
WOMEN	5.4g per day
Target (2025)	2.8g per day

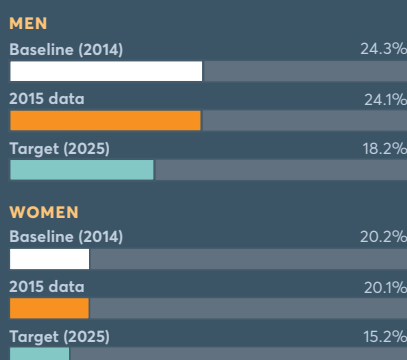**In 2017, the global mean salt intake was 5.6g per day, twice the global target.**

Notes: Projections not yet available. This data is for adults 25 years and older. If China was removed, the global average would be 4.0g.

Raised blood pressure

OFF COURSE

A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstance.
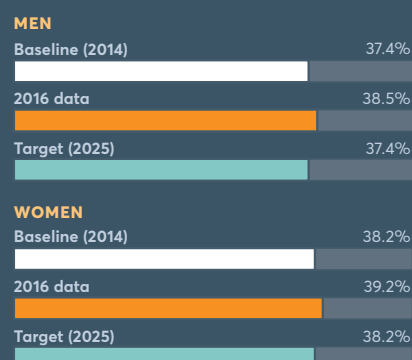
MEN

Baseline (2014)	24.3%
2015 data	24.1%
Target (2025)	18.2%

WOMEN

Baseline (2014)	20.2%
2015 data	20.1%
Target (2025)	15.2%

In 2015, 597.4 million men and 529.2 million women had raised blood pressure – 1.13 billion adults in total. Probability of meeting the global target is almost zero based on projections to 2025.

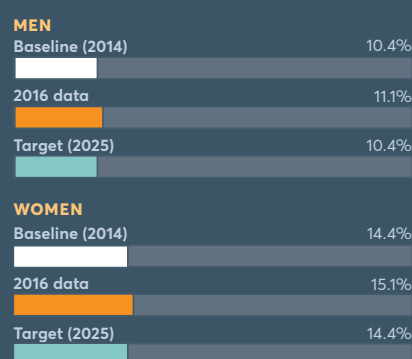### Adult overweight

OFF COURSE

Halt the rise in prevalence.

MEN

Baseline (2014)	37.4%
2016 data	38.5%
Target (2025)	37.4%

WOMEN

Baseline (2014)	38.2%
2016 data	39.2%
Target (2025)	38.2%

In 2016, 984.6 million men and 1.02 billion women were overweight – 2.01 billion adults in total.

Adult obesity

OFF COURSE

Halt the rise in prevalence.

MEN

Baseline (2014)	10.4%
2016 data	11.1%
Target (2025)	10.4%

WOMEN

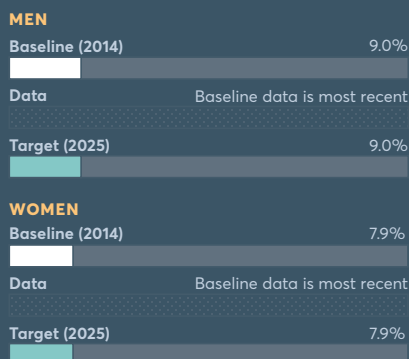|	
Baseline (2014)	14.4%
2016 data	15.1%
Target (2025)	14.4%

In 2016, 284.1 million men and 393.5 million women were obese – 677.6 million adults in total. Probability of meeting the global target is almost zero based on projections to 2025.

Adult diabetes

OFF COURSE

Halt the rise in prevalence.

MEN

Baseline (2014)	9.0%
Data	Baseline data is most recent
Target (2025)	9.0%

WOMEN

Baseline (2014)	7.9%
Data	Baseline data is most recent
Target (2025)	7.9%

In 2014, 217.8 million men and 204.4 million women were diabetic – 422.1 million adults in total. Probability of meeting the global target is low (<1% for men, 1% for women) based on projections to 2025.

Adult underweight

WOMEN

2016 data	9.7%

In 2016, 153.8 million women were affected.

Adolescent underweight
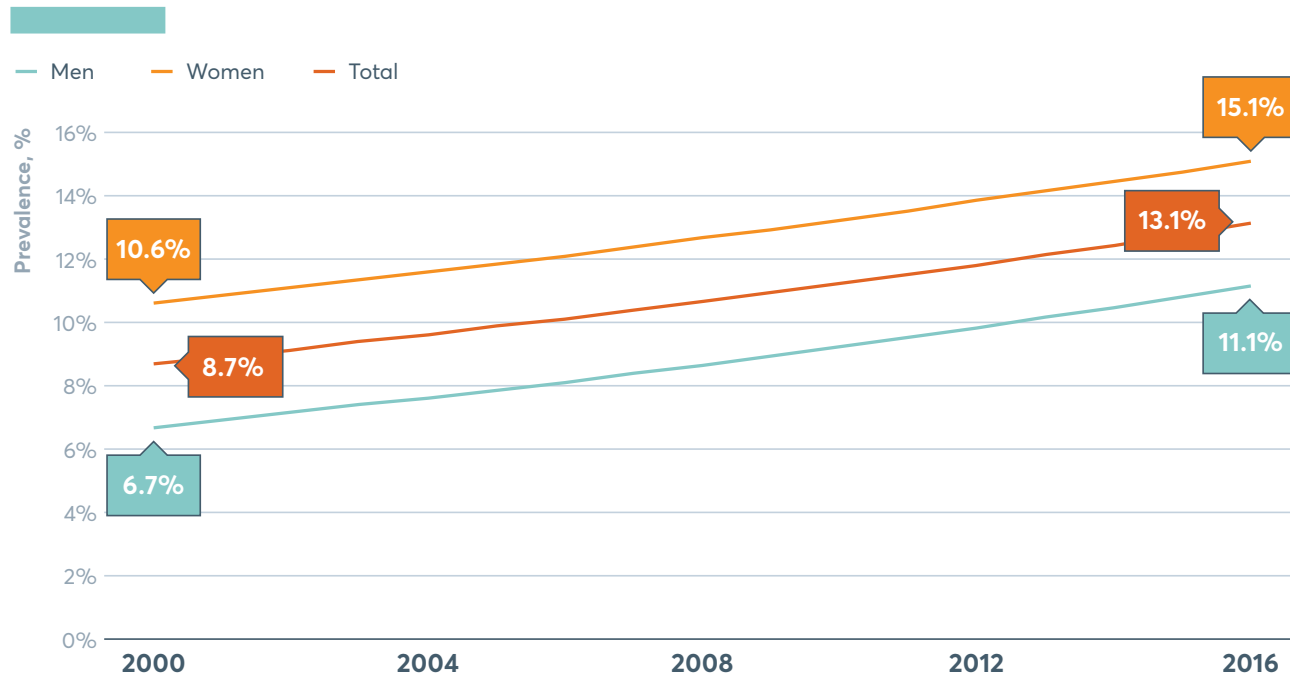
GIRLS

2016 data	5.7%

In 2016, 16.2 million girls were affected.

Notes: Women aged 20–49 whose BMI is less than 18.5 kg/m². Adolescent girls aged 15–19 who are more than two standard deviations below the median weight-for-age of the WHO Child Growth Standards.

FIGURE 2.3

Global prevalence of obesity (BMI ≥30) among adults aged 18 years and over, 2000–2016

— Men   — Women   — Total

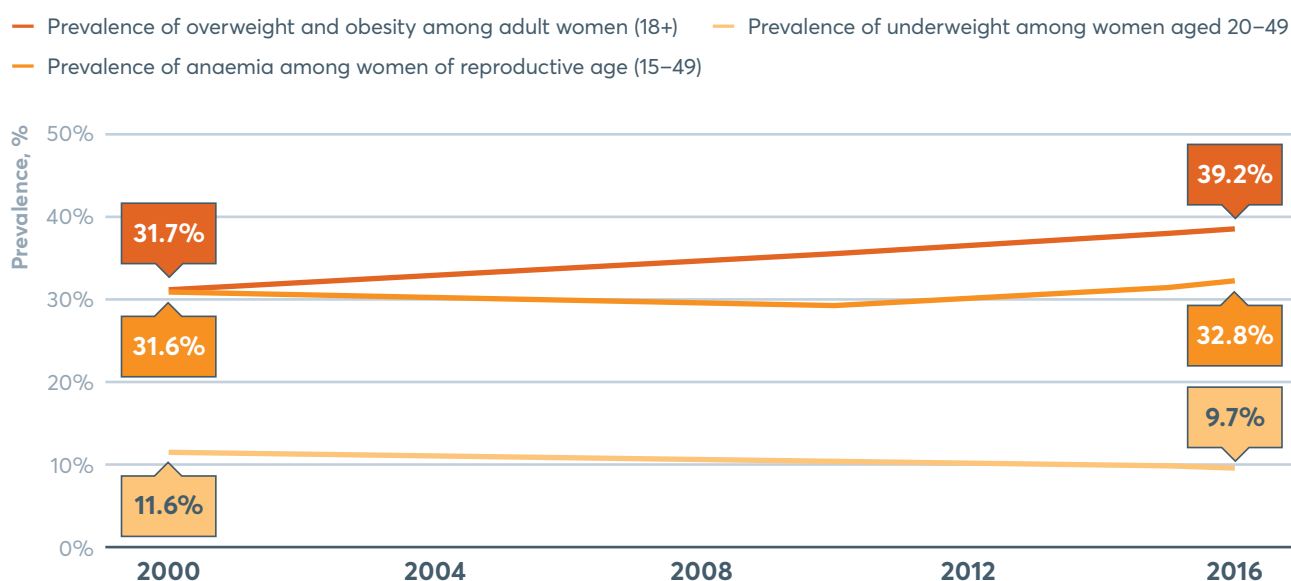**Source:** NCD Risk Factor Collaboration.

Obesity, anaemia and underweight each have major implications for women's health as well as the nutritional and health status and capacity of their children.[22] Figure 2.4 shows the increase of anaemia and overweight (including obesity) among women. While underweight is declining slightly, it is not significant (to 9.7% of women) and underweight among adolescent girls has increased from 5.5% in 2000 to 5.7% in 2016.[23] Globally, women have shown a higher prevalence of overweight and obesity compared with men every year since 2000.

Where malnutrition in all its forms exists

Looking deeper at disaggregated figures, stunting is most prevalent in low and lower-middle-income countries: 37.8 million children affected are in low-income countries where the daily average income is less than $2.80 per person per day.[24] Another 101.1 million children are in lower-middle-income countries where incomes are less than $11 per person per day. Both the number of people affected (37.0 million) and highest prevalence of wasting (11.5%) occur in lower-middle-income countries and are lowest (0.5 million and 0.7% respectively) in high-income countries.

FIGURE 2.4
Global prevalence of anaemia, overweight (including obesity) and underweight in women, 2000–2016

— Prevalence of overweight and obesity among adult women (18+)   — Prevalence of underweight among women aged 20–49

— Prevalence of anaemia among women of reproductive age (15–49)

Source: NCD Risk Factor Collaboration, WHO Global Health Observatory.
Notes: Underweight in adults is defined as BMI <18.5; overweight in adults is BMI >=25kg/m; anaemia in pregnant women is a haemoglobin level <100g/L; anaemia in women who are not pregnant is defined as a level of 120g/L.

Among countries, there is a difference between those with the highest prevalence and those with the largest numbers of people affected by stunting. In three countries, Burundi, Eritrea and Timor-Leste, more than half of children under five are stunted. Another three countries are home to almost half (47.2%) of all stunted children: India, Nigeria and Pakistan. The three countries with the largest number of children who are stunted are India (46.6 million), Nigeria (13.9 million) and Pakistan (10.7 million). The three countries with the most children who are wasted are almost the same ones – India (25.5 million) and Nigeria (3.4 million) but also Indonesia (3.3 million).

The urban prevalence of stunting is on average 19.2% compared with 26.8% in rural areas.[25] Wasting still affects a greater proportion of rural children than urban, though the contrast is far less pronounced (urban is 5.8%, rural is 6.4%).[26] More boys than girls are stunted and wasted. Stunting is on average 25.6% among boys and 22.6% among girls,[27] while wasting is on average 6.8% among boys and 5.7% among girls.[28]

Prevalence of overweight among children is highest in upper-middle-income countries and lowest in low-income countries. In urban areas, overweight among children stands on average at 7.1% whereas in rural areas it is 6.2%. Overweight is slightly more common on average among boys (6.9%) than girls (6.1%).[29]

In four countries, more than a fifth of all children are overweight: Ukraine, Albania, Libya and Montenegro. A very different set of countries have more than a million children overweight: China, Indonesia, India, Egypt, US, Brazil and Pakistan.

As with obesity, overweight in adults is greater among women than among men (39.2% and 38.5% respectively in 2016). Conversely, diabetes is more common among men than women (9.0% and 7.9% respectively in 2014). Similarly, more men have raised blood pressure than do women (24.1% and 20.1% respectively in 2015).

China is an example of a country with differing levels of vulnerabilities to differing forms of malnutrition in its population. Spotlight 2.1 demonstrates China's journey to address malnutrition in all its forms and its efforts to take a multisectoral approach.

SPOTLIGHT 2.1

New nutrition policies for China

Kevin Chen and Zimeiyi Wang

China's agricultural and economic success has enabled it to supply enough nutritious food for its large population as well as significantly reduce rates of stunting and wasting. However, China still has high levels of undernutrition, with poor regions and vulnerable groups such as children, women, older people and migrants disproportionally affected. The shortage of essential micronutrients also affects millions of Chinese people, and while undernutrition remains a problem, overweight and obesity resulting from excessive saturated fats, calories and/or sugar are increasing at alarming rates. Amid urbanisation, an ageing population and industrialisation, diet-related NCDs such as diabetes are on the rise.

In this context the government of China has developed two plans with the potential to transform malnutrition in China. Healthy China 2030 (2016) is the first national medium to long-term strategic plan in the health sector – more than 20 government departments were involved in its development using an explicit 'health-in-all-policies' approach. With the direct involvement of the President of China, the plan underlines the significant political will to enhance the health status of Chinese citizens. One of the five core strategies of the plan is prevention through healthier living, using premature death from NCDs as one of its indicators of progress.

A year later the government released a new National Nutrition Plan (2017–2030), with a range of malnutrition targets including stunting, obesity, anaemia, breastfeeding and folic acid deficiency among vulnerable people. Emphasis has been placed on nationwide actions and programmes targeting vulnerable populations with disproportionate burdens. The plan reinforces existing nutrition programs benefitting infants, children, primary and middle school students, and pregnant women. It also proposes new interventions for people who are older, ill or living in poor areas. Given the historically unbalanced focus on rural populations, especially infants and children, another goal is to reduce the difference in height between urban and rural students.

The plan includes nutrition monitoring, new dietary reference intakes, screening programmes, a campaign to promote healthy lifestyles, recommended limits for sugars, fats and salt in packaged foods, nutrition labelling in cafes and restaurants, standards on fortified foods, and education on healthy diets. It recommends a balanced diet combining cereals, meat, vegetables, fruit, milk and soy – very different from current starch-based diets with a very high consumption of meat. It builds on existing programmes such as Ying Yong Bao, a national programme delivering a multivitamin package to women and young children in poor regions which costs the government about 15 billion Chinese yuan (about US$2.5 billion) a year.

In line with a multisectoral approach, there have also been changes in supply-side policy. China is shifting its focus from quantity to quality of food production and paying attention to the importance of linking agriculture and nutrition to provide more nutritious and diversified crops. The Food and Nutrition Development Outline 2014–2020 emphasises food quantity and quality equally, as well as innovation and the coordination of production and consumption. Meanwhile, agricultural policies are evolving – albeit slowly – to promote the evaluation of agricultural products' quality and nutrition, as well as research on the impact of food processing, storage and transportation of nutrients.

An emerging nutrition governance system deserves credit for the political and administrative commitment to food and nutrition security. Nutrition has traditionally been the mandate of the National Health Commission, with technical support from the Chinese Center for Disease Control and Prevention and the Chinese Nutrition Society. However, multisectoral coordination is beginning to show benefits – in 1993, the Ministry of Agriculture launched the State Food and Nutrition Consultant Committee, and then the Institute of Food and Nutrition Development as its administrative and research body. The committee was tasked with improving the national coordination and planning of agriculture, food and nutrition, drawing on experts from fields including agriculture, food,

nutrition, health, economy and trade. It is committed to coordinating national nutrition policies and interventions and accelerating improvements to address the underlying causes of malnutrition. It contributed to the development of the Food and Nutrition Development Outline and the implementation of several nutrition interventions nationwide. Further synergies came in 2017 when the National Health Commission, jointly supported by the Ministry of Agriculture and the General Administration of Sport, established the National Nutrition and Health Steering Committee and the National Working Group on Nutrition Promotion to push the National Nutrition Plan forward.

The increased prominence of nutrition in China's policy discourse shows what institutional coordination can achieve – but it also offers a cautionary tale on limitations. Given that it is an advisory body, with decision-making remaining in the Ministry of Agriculture and the National Health Commission, the State Food and Nutrition Consultant Committee lacks the authority to facilitate and monitor inter-sectoral policies and actions. Coordination failures continue to occur, and the responsibilities of the different parties are unclear. Weak vertical coherence among agriculture and nutrition authorities and institutions at the central and provincial levels is another challenge, while most provinces do not have institutions dedicated to nutrition research or policymaking. Improving nutrition does not affect the political career of local leaders, resulting in a disconnect between high-level policies and practices on the ground. China is at a turning point to further improve the authority, accountability and responsiveness of its nutrition governance.

Country-level progress towards nutrition targets

The Global Nutrition Report tracks country progress against nine of the global nutrition targets[30] highlighted in Chapter 1 using the latest available data. However, we are aware of the inherent limitations of doing so: assessing and interpreting country-level progress is complex, as is analysing why any given target is on or off course. Government interventions and economic growth can influence progress. Individual countries may be on course to hit certain targets but not others. And the availability and quality of data differs across targets, owing to differing collection and modelling approaches. Data coverage for the obesity and diabetes targets is much greater than for the children under five years of age targets because it is modelled. See Appendix 1 for details of the methods and sources used to assess progress towards global nutrition targets.
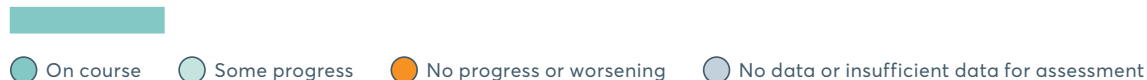
In 2018, 194 countries were included in the tracking analysis. New data in 2018 has provided over 80 additional data points across 32 countries, enabling a greater number of country targets to be assessed than ever before.

Of the 194 countries analysed, 38 were found to be on track for overweight, 37 for wasting, 31 for exclusive breastfeeding, 26 for diabetes among women, 24 for child stunting and 8 for diabetes among men. However, no country is on track to achieve the adult obesity target, for neither men nor women. This is despite the obesity target being to halt the rise of prevalence, not necessarily decrease the trend that we are seeing. Nor is any country on track to reach the anaemia target to decrease it by 50% among women of reproductive age – and indeed we are seeing the opposite trend (Figure 2.5).

Across the nine targets, 94 countries are on track to achieve at least one. Of these, 44 countries are on track to meet just one target, 35 countries are on track to meet two, 10 countries to meet three, and just 5 countries are on track to meet four targets – the maximum number of targets any country is on track for (see Appendix 2 for additional country detail).

FIGURE 2.5
Countries on course to meet global targets on nutrition

● On course ● Some progress ● No progress or worsening ● No data or insufficient data for assessment

Maternal, infant and young child nutrition targets

Anaemia

| 49 | 138 | 7 |

Exclusive breastfeeding

| 31 | 13 | 20 | 130 |

Childhood stunting

| 24 | 27 | 16 | 127 |

Childhood overweight

| 38 | 23 | 133 |

Childhood wasting

| 37 | 12 | 24 | 121 |

Nutrition-related NCD targets

Obesity, men

| 180 | 14 |

Obesity, women

| 178 | 16 |

Diabetes, men

| 8 | 182 | 4 |

Diabetes, women

| 26 | 164 | 4 |

Source: UNICEF/WHO/World Bank Group: Joint child malnutrition estimates, UNICEF global databases: Infant and Young Child Feeding, NCD Risk Factor Collaboration, WHO Global Health Observatory.
Notes: Assessment based on 194 countries. The methodologies for tracking differ between targets. Data on the adult indicators are based on modelled estimates. See Appendix 1 for details of the methods and sources used to assess progress towards global nutrition targets.

Analysis to assess the progress in meeting Sustainable Development Goal (SDG) 2 has recently been conducted by the Brookings Institution and is shown in Spotlight 2.2. This analysis shows the world is making some progress to end stunting, wasting and undernourishment (an indicator defined by the Food and Agriculture Organization (FAO)[31]) by 2030 when the SDGs end. However, it also shows that the pace is not fast enough to end these forms of malnutrition by 2030. Childhood overweight has the worst projections: if current trajectories continue, the number of children overweight will only increase.

A step forward, however, has been that countries are establishing national targets for nutrition, and a fuller range of national targets to cover more forms of malnutrition. Spotlight 2.3 highlights steps being taken to set national nutrition targets. Tanzania is an example of a country that has adopted a wide range of targets and a multisectoral plan to deliver them – but nevertheless faces the challenges of costing and financing in its ability to do so (Spotlight 2.4).

Counting who will be left behind by 2030

Homi Kharas, John W. McArthur and Krista Rasmussen

A core aim of the SDGs, agreed by all UN member states in 2015, is to accelerate progress on common economic, social and environmental priorities by 2030. The first step is to assess current trends and identify where the world needs to do better. The Brookings Institution recently published a study[32] examining the trajectories of more than two dozen people-focused SDG indicators, including four indicators linked to goal 2: child stunting, child wasting, child overweight and people undernourished (using the FAO statistic for hunger).

Consistent with the SDG ambition to leave no one behind, the study takes a literal interpretation of the targets aiming to end hunger and malnutrition. Extrapolating recent national rates of progress out to 2030, the findings show advances on multiple fronts. But we also found the world is off course and will be less than halfway to ending stunting, wasting and undernourishment by the deadline.

Figure 2.6 shows the share of the world's initial SDG gap that will be closed by 2030 on current trajectories, measured by how many people achieve the target versus how many are left behind. On stunting, for example, the chart shows that the world will have alleviated only 44% of the burden. Overweight among children is actually growing in the vast majority of countries.

The human consequences of these shortfalls are considerable. If current trajectories continue, more than 660 million people (8% of the world) will still be undernourished in 2030. Meanwhile, more than 100 million children under five years of age (15%) will be stunted, more than 40 million (6%) will be wasted, and more than 90 million children aged two to four years (22%) will also be overweight. We need a significant breakthrough if we are to fulfil the SDG vision of leaving no one behind on hunger and malnutrition.

FIGURE 2.6
Share of SDG global gap closed by 2030, on current trajectory
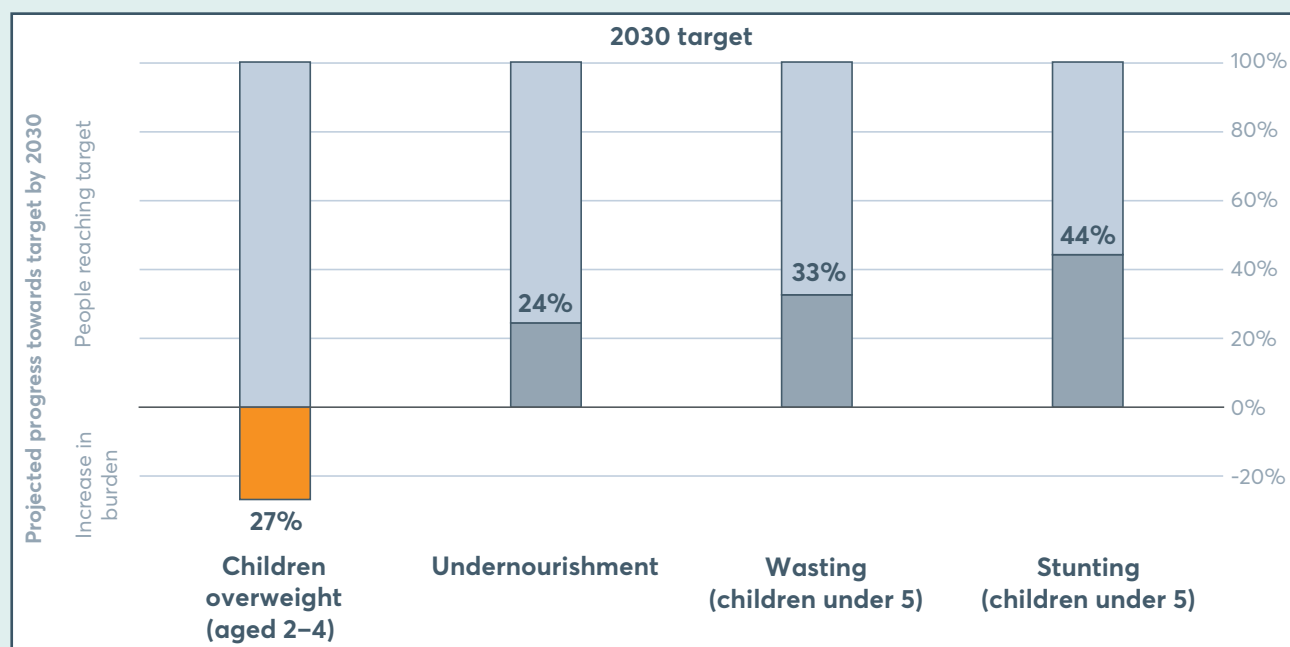
Source: Development Initiatives based on Kharas H., McArthur J.W. and Rasmussen K., 2018.[33]

SPOTLIGHT 2.3

## Countries are stepping up on setting nutrition targets

Kaia Engesveen, Krista Lang, Roger Shrimpton and Chizuru Nishida

Establishing national nutrition targets is critical for countries to hold themselves accountable, and to know what they want to achieve when developing national nutrition plans.[34]

The second edition of the Global Nutrition Policy Review (GNPR2), published in 2018 by the World Health Organization (WHO),[35] tracks the number of countries with nutrition policies and targets. Among those countries with relevant nutrition policies, there has been a marked increase over two years in adopting national targets. The *2016 Global Nutrition Report* noted that of 122 national nutrition plans, only 49% had national targets and just 36% of NCD plans included targets for obesity. While some of the increase is highly likely to be down to the greater number of European countries reporting, and the larger number of obesity/NCD plans included, the GNPR2 reports a very different situation. As shown in Figure 2.7, almost all of the 191 countries (99% or 189) included in the Global database on the Implementation of Nutrition Action (GINA) have at least one nutrition target; 84% (160) have targets for adult and adolescent obesity; 73% (139) for child overweight; and 46% (87) for anaemia. Furthermore, more countries are including a fuller suite of targets – 81% (154) have three or more targets, 42% (81) have between six and eight targets, and 38% (73) between three and five. Only 19% (37) have two targets or fewer (Figure 2.7).

An important consideration is that countries need to have targets that are relevant to addressing the nutrition situation in their countries. An in-depth analysis by WHO in the GNPR2 shows that 93% of countries with stunting prevalence of 20% or higher had relevant targets. A smaller but still significant percentage of countries with a burden of overweight among children (prevalence over the global baseline of 6%) has a relevant target (76%). Four fifths (79%) of countries with exclusive breastfeeding of less than 50% have a relevant target and 76% of countries with wasting prevalence of 5% or higher have a wasting target. Anaemia was once again at the bottom with 63% of countries with anaemia in women of reproductive age at 20% or higher having an anaemia target.

FIGURE 2.7
Percentage of countries with selected nutrition targets, 2018
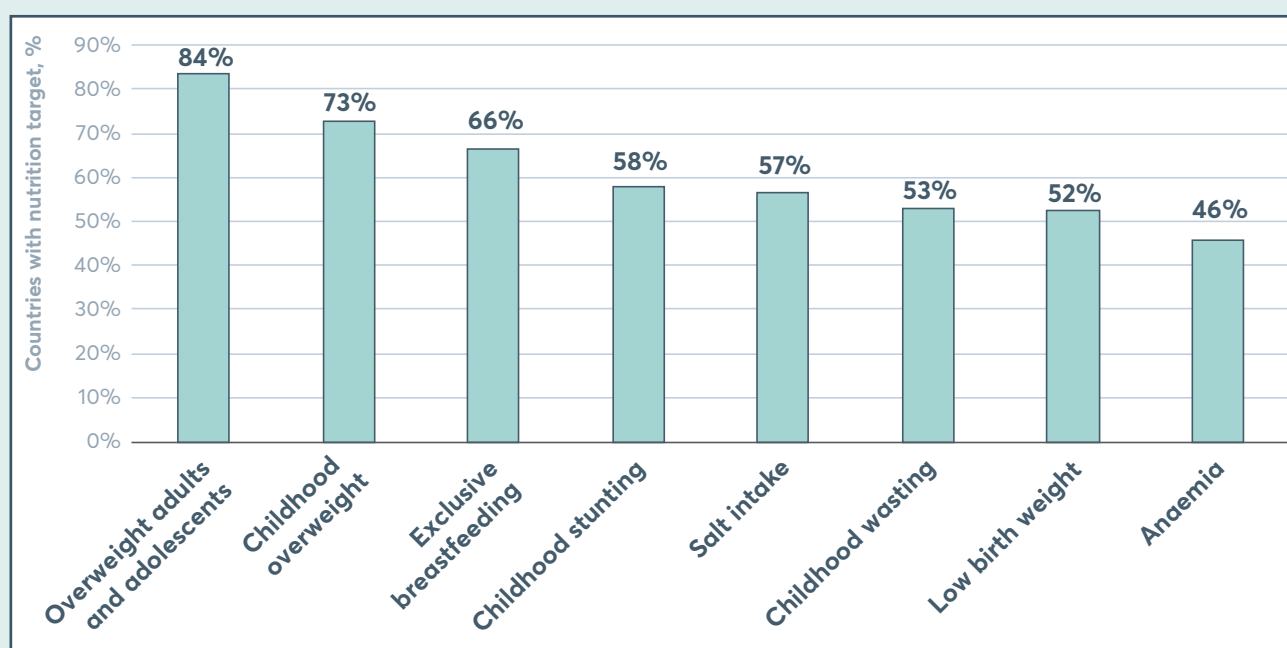
Source: WHO Global database on the Implementation of Nutrition Action (GINA), 2nd Global Nutrition Policy Review.
Notes: Percentage is of 191 WHO member states who responded to the survey and for which there is adequate data (Bahamas, Monaco and United Arab Emirates have been excluded).

SPOTLIGHT 2.3

Another notable change has been the increasingly multisectoral nature of nutrition plans. Information in WHO GINA shows that 100 (61%) of the 164 countries with national nutrition plans developed in 2000 or later have multisectoral plans involving two or more government sectors. Of these, 46 had more than three sectors involved in their policies, 27 had three and 27 had two; the sectors most commonly included alongside health were agriculture and education. Interestingly, countries with a nutrition policy involving two or more sectors included an average of 5.6 targets, compared with just 4.7 targets in countries involving only one government sector.

Despite these advances, there remain major gaps in setting targets relevant to the country context and in the costing of plans to deliver the targets. Just 39% of the countries in the GNPR2 reported that their nutrition policies were accompanied by costed operational plans, and just 23% in the WHO African Region. Another gap is that even if they are costed, they may not be fully funded as exemplified by the case of Tanzania (Spotlight 2.4).

SPOTLIGHT 2.4

Developing and delivering an action plan on the double burden of malnutrition in Tanzania

Obey Assery

Tanzania is an example of a country which has adopted a wide range of nutrition targets – seven in all.[36] These targets form part of the National Multisectoral Nutrition Action Plan 2016–2021, an ambitious five-year action plan to reduce multiple burdens of malnutrition. Set up under the direct leadership of the Prime Minister's office, it explicitly takes a 'double burden' approach covering all forms of malnutrition associated with both deficiency and excess/imbalance. Its broad goal is to scale up high-impact interventions among the most vulnerable people – infants, children under five years of age, adolescent girls, pregnant and lactating women, and other women of reproductive age. It focuses on six areas: maternal, infant, young child and adolescent nutrition; micronutrient deficiencies; acute malnutrition and diet-related NCDs; interventions across sectors; nutrition governance; and nutrition information systems. The plan calls for actions across sectors including agriculture, health services, community mobilisation, public awareness platforms, social protection, education, food, and water and sanitation. The plan drew from, and sits alongside, the Strategic Action Plan for the Prevention and Control of Non-Communicable Diseases in Tanzania 2016–2020.

Yet funding remains a challenge. In the financial year 2016/2017 only a quarter of the programme costs were fully funded, although the government subsequently increased this to 40% in the hope that the remaining 60% would be provided by development partners. As of 2018 it is uncertain how much of this funding shortfall will be met, and further resources are urgently required to ensure the most vulnerable groups get the help they need. There are some encouraging signs – for example, additional government spending on children under five years of age doubled from Tanzanian shillings (TZS) 500 (US$0.25 per child) in 2016/17 to 1,000 TZS (US$0.5 per child) in 2017/18 – but this is still a long way off the World Bank recommendation of US$10.0 per child per year.[37] Notably, those parts of the plan focusing on obesity and NCDs are not funded, nor are the actions on nutrition governance and nutrition information systems – putting them at risk of being scaled down or cut altogether. Resource mobilisation comes under the leadership of the Prime Minister's Office, and now the plan is costed but only part-funded, stakeholders must get together to plug the remaining financing gap in the same way they came together during its formulation.

Data on multiple and coexisting forms of malnutrition

Multiple forms of malnutrition at a national level

In 2014, the Global Nutrition Report coined the term the 'new normal' to reflect the reality that most countries in the world experience a serious burden of one or more forms of malnutrition. Recognising the multiple forms of malnutrition and their impact is a new challenge. Many governments are already showing leadership by recognising these multiple burdens when setting nutrition targets (Spotlight 2.3). Understanding how these forms of malnutrition overlap and coexist is also essential to develop effective policies and allocate resources to tackle them.

Building on previous assessments, this year's report sheds light on the nature of these multiple forms of malnutrition by analysing which countries experience high levels of three types of malnutrition at the national level.

Figures 2.8 and 2.9 demonstrate that 124 of the 141 countries for which there is sufficient data experience more than one form of malnutrition based on three metrics and their thresholds:[38] childhood stunting, anaemia in women of reproductive age, and overweight in adult women (for a full list of countries see Appendix 3).

The data shows that all 141 countries experience at least one form of malnutrition with only 17 countries experiencing just one form (Figures 2.8 and 2.9). Of these, 41 countries (29%) have high levels of all three forms and 83 countries (59%) have high levels of two forms of malnutrition.

Of the 41 countries with three forms of malnutrition, 13 are low-income countries and 19 are lower-middle-income countries. Africa is by far the hardest hit by the overlapping forms of malnutrition. Of the 41 countries that struggle with all three forms of malnutrition, 30 are in Africa.

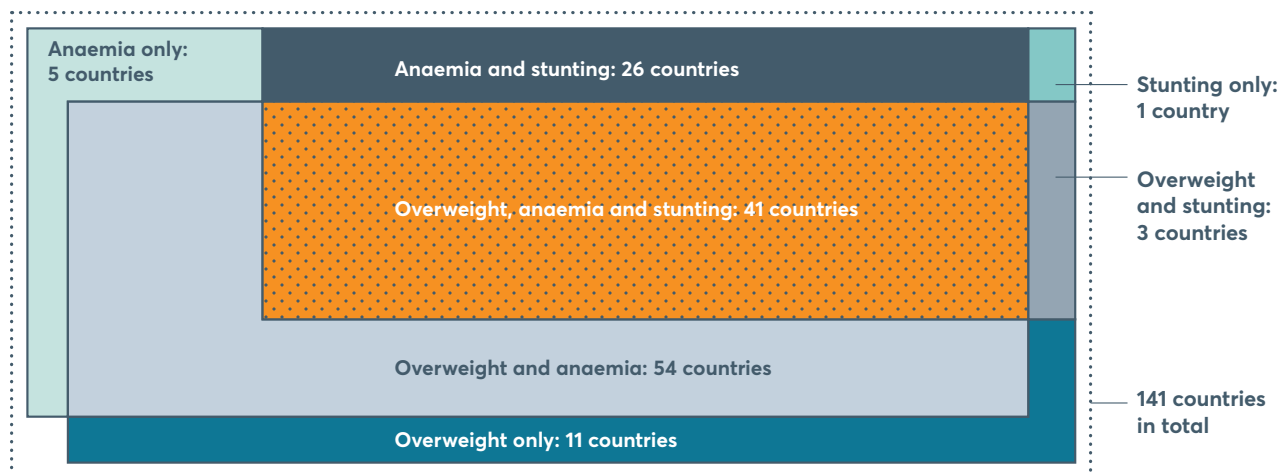## The challenge of coexistence of malnutrition in individuals

It has been well established for many years that undernutrition coexists with overweight and obesity at a country level. This 'double burden' is also found in communities and households, notably with stunted children living in households with overweight mothers. Several studies have been published to better understand these disparate outcomes between mothers and their children.[39] Newly emerging analysis also shows that conditions associated with stunting can coexist with overweight in the *same person*.[40] To make matters worse, conditions of deficiency such as low birth weight and undernutrition in early life can be associated with increased risk of NCDs later in life.[41]

New data analysis conducted by the Global Nutrition Report this year confirms that this double burden can exist in the same people at the *same time*, providing new evidence on the extent to which young children experience multiple forms of malnutrition. A UNICEF dataset[42] of nutrition data on children under five years of age from 106 countries shows that 1.87% of under-fives globally (8.23 million children) experience both stunting and overweight. Europe and Africa have the highest prevalence rates of coexistence: 2.7% and 2.3% respectively compared with 0.8% in the Americas. Much more work is needed to assess the degree to which overweight children, adolescents and adults may also be experiencing micronutrient deficiencies.

Another aspect of this discussion is the coexistence of overweight/obesity and household food insecurity.[43] In the US, women who are food insecure, particularly women with children, are more likely to be affected by obesity and consume poor quality diets.[44] In other settings, the relationships between obesity and food insecurity do not show the patterns seen in the US.[45] These relationships will undoubtedly vary from place to place and more work is needed to understand their dynamics, as explored in the *2018 State of Food Insecurity and Nutrition* report.[46]

FIGURE 2.8
Numbers of countries with overlapping forms of childhood stunting, anaemia and overweight in adult women, 2017 and 2018
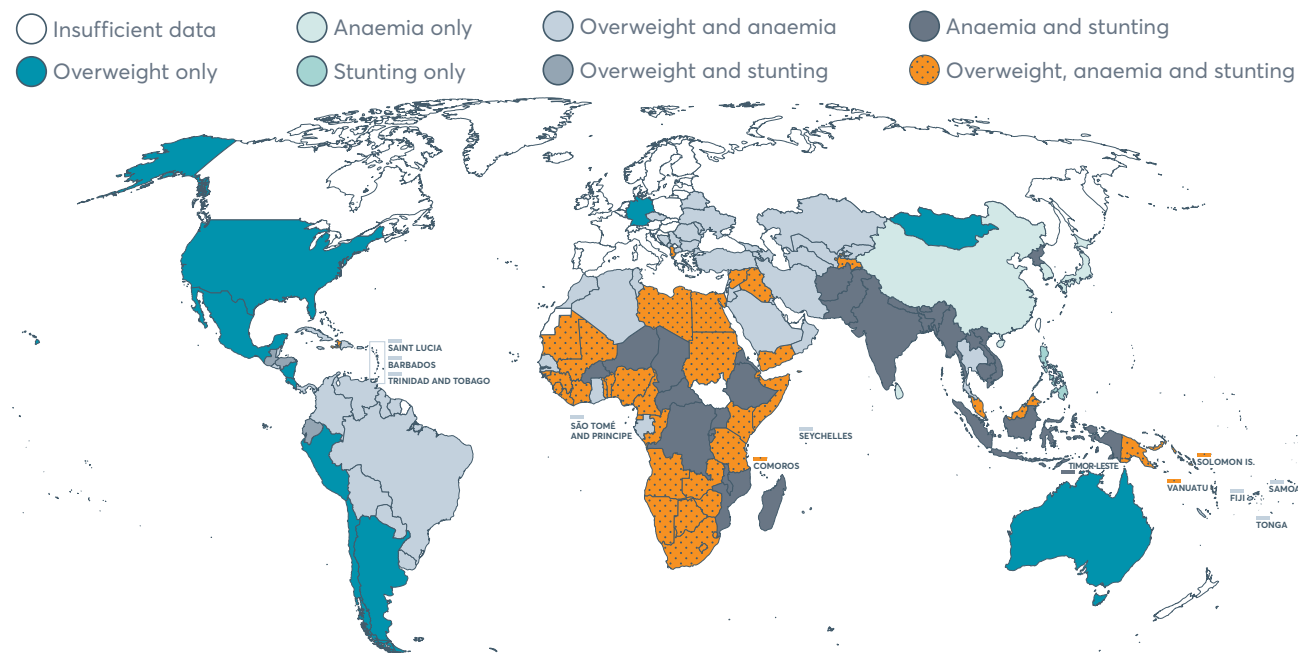
Anaemia only:
5 countries

Anaemia and stunting: 26 countries

Stunting only:
1 country

Overweight, anaemia and stunting: 41 countries

Overweight and stunting: 3 countries

Overweight and anaemia: 54 countries

141 countries in total

Overweight only: 11 countries

Source: UNICEF/WHO/World Bank Group: Joint child malnutrition estimates, NCD Risk Factor Collaboration, WHO Global Health Observatory.
Notes: Thresholds for a country having the form or not: 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%. Based on data for 141 countries.

FIGURE 2.9
Map of countries with overlapping forms of childhood stunting, anaemia and overweight in adult women, 2017 and 2018

○ Insufficient data   ○ Anaemia only   ○ Overweight and anaemia   ● Anaemia and stunting

● Overweight only   ○ Stunting only   ○ Overweight and stunting   ● Overweight, anaemia and stunting

SAINT LUCIA
BARBADOS
TRINIDAD AND TOBAGO

SÃO TOMÉ AND PRINCIPE

SEYCHELLES

COMOROS

TIMOR-LESTE

SOLOMON IS.

VANUATU

FIJI

SAMOA

TONGA

Source: UNICEF/WHO/World Bank Group: Joint child malnutrition estimates, NCD Risk Factor Collaboration, WHO Global Health Observatory.
Notes: 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%. Based on data for 141 countries.

Building on recent efforts to highlight the relationship between stunting and wasting as shown in Spotlight 2.5 in a smaller set of countries, the Global Nutrition Report also analysed nutrition data on children under five years of age[47] to determine the extent to which children can experience wasting and stunting at the same time. Analysis shows that 3.62% of under-fives globally are both stunted and wasted – 15.95 million children. Asia and Africa have the highest prevalence rates: 5.0% and 2.9% respectively compared with 0.2% in Europe. While the physiological mechanisms leading to this are not well understood, important evidence indicates that these children are at an elevated risk of dying that compares with that of severe wasting.[48]

Until recently, the global prevalence of children who are wasted and stunted at the same time has not been known, even though data to calculate it is readily available. This gap is important not only because these children are at high risk of death and therefore in need of nutrition support, but also because reporting on nutrition deficits separately underestimates the burden of these forms of undernutrition on the global child population as a whole.[49]

Going beyond the national level – new insights from geospatial and subnational data

Geospatial data is transforming development. For nutrition, it is providing new information on how the burdens of malnutrition and rates of change vary within countries. Spatial analysis studies have identified both where there are hotspots of malnutrition and inequities in child stunting.[50] Two new studies in 2018 provide an even more comprehensive assessment of the situation across Africa and in India.

Spotlight 2.6 describes a geospatial analysis of undernutrition in 51 African countries conducted by researchers at the Institute for Health Metrics and Evaluation. By drilling down to the subnational level, the analysis reveals a striking heterogeneity in levels and trends of undernutrition. Even where countries appear to be on track to achieve global targets, the picture is different at the subnational level. Future work by the research team will provide insights into other key nutritional indicators such as childhood overweight, exclusive breastfeeding in the first six months of life and anaemia in women of reproductive age and will expand the existing analysis to all low and middle-income countries. The researchers are also investigating overlapping burdens of child growth failure and overweight in the same population at this very detailed level.

Coexistence of stunting and wasting in countries

Carmel Dolan and Tanya Khara

A group of experts have highlighted the relationship between wasting and stunting: the Wasting-Stunting Technical Interest Group,[51] coordinated by the Emergency Nutrition Network. In 2017, they undertook an innovative analysis to generate the first multiple country prevalence and burden estimates of coexisting forms of both wasting and stunting in children aged 6 months to five years.[52] Using Demographic Heath Surveys and Multiple Indicator Cluster Surveys data from the last 10 years, the analysis yielded 84 country prevalence estimates, pooled prevalence and burden estimates and explored age, sex, regional and contextual differences. They found countries classified as fragile and conflict-affected have a significantly higher prevalence (3.6%) than those defined as stable (2.2%).[53]

The life-limiting and mortality risk associated with the coexistence of wasting and stunting should make this a priority issue for urgent action. Added to this, the transitory nature of child wasting (children can experience several episodes of wasting in their early years) means that relying on cross-sectional data underestimates[54] the true burden of children having these two deficits at the same time.

Two points arise from this analysis. First, the Global Nutrition Report receives its yearly data on stunting, wasting and overweight among children under the age of five from population-level surveys and the annual global joint child malnutrition estimates. These could quite easily and systematically report on the prevalence of children wasted and stunted at the same time and, as with the severe acute malnutrition caseload, also compute the likely numbers of children in need of attention. The data highlighted earlier has already signalled that the joint estimates has a gap to fill.

Second, given the high mortality risk associated with being wasted and stunted at the same time, the extent to which these children are being detected and adequately supported through existing nutrition services and interventions to lift them out of this high-risk group needs further investigation. There is interesting emerging evidence that weight-for-age in addition to mid-upper arm circumference (MUAC) is the most reliable way of detecting children who are at most risk[55] and the potential therefore to capitalise on community and health clinic entry points where child growth is routinely monitored.

Our analysis clearly points towards the need to break away from the silos of wasting versus stunting, treatment versus prevention and severe versus moderate wasting that have typified the international nutrition architecture over the last decade. It is in combination that wasting and stunting confer the highest mortality risk to potentially a larger proportion of the child population than that affected by severe wasting. So it makes sense for treatment or prevention approaches to deal with wasting and stunting together where they coexist. This analysis calls for us to do better at bridging these divides.

SPOTLIGHT 2.6

Using geospatial data to track nutrition progress in Africa

Aaron Osgood-Zimmerman, Anoushka I. Millear, Rebecca W. Stubbs, Chloe Shields, Brandon V. Pickering, Damaris K. Kinyoki, Nicholas J. Kassebaum and Simon I. Hay

We all use geospatial data – think of weather forecasts, satnavs and geotagged social media posts. But it can also help policymakers, programme designers and organisations working on the ground to alleviate child undernutrition. The latest data-driven geospatial estimates for Africa provide a revolutionary new resource – a detailed public health tool aimed at targeting interventions to those populations with the greatest need. Spatially resolved data gives us an indication of progress – or lack of it in certain localities.

In 2018 the journal *Nature* published the results[56] of a comprehensive geospatial analysis of child growth failure, which covers stunting, wasting and underweight, in 51 African countries from 2000 to 2015. Drawing from more than 200 geo-referenced household surveys representing more than 1.2 million children[57] to estimate child growth failure prevalence on a 5×5km grid, it drills down to unprecedented levels of detail. This provides highly relevant information on key nutrition indicators not only by country, but also by local administrative subdivisions such as provinces, districts and communities. This is significant because national estimates tend to mask disparities at the local level, where most health and nutrition-policy planning and implementation occur.

The results show a mixed picture, with some encouraging undernutrition improvements – particularly in western, northern and southern coastal countries – sitting alongside high levels of child growth failure, especially across the Sahel. But it is probably no coincidence that many countries with slower average gains, such as Central African Republic, Chad, Somalia and most others in the Sahel, received less international assistance for newborn and child health and have experienced periods of conflict. There is also a strong correspondence between areas with a high prevalence of wasting in 2015 and countries identified by the UN as being at imminent risk of famine. At this rate, most of Africa will fail to meet the SDG target of ending all forms of malnutrition by 2030.

Figures 2.10A–C show the changes in prevalence of moderate and severe stunting at 5×5km resolution in 2000, 2005, 2010 and 2015. Figure 2.10B shows the annualised decrease in stunting from 2000 to 2015, relative to rates needed from 2015 to 2025 to meet the WHO global nutrition target of a 40% reduction by 2025. Based on past performance, purple pixels have already met the target, blue pixels are exceeding the pace needed to meet the target, those at 100 (green) are on track, and yellow and orange pixels must speed up. Figure 2.10A shows the probability that the stunting target was achieved in each 5×5km pixel in 2015. The probability that dark blue pixels have met the target in 2015 is greater than 95% and for dark-red pixels is less than 5%. Maps reflect administrative boundaries, land cover, lakes, and population; pixels with fewer than 10 people per 1×1km and classified as 'barren or sparsely vegetated' are shaded in grey.

Stunting is the most prevalent form of child growth failure across all years and countries, but once again, the data shows wide disparities. Greatest improvements up until 2015 were in coastal central Africa, particularly some parts of Ghana, Gabon and Equatorial Guinea. Imo state in Nigeria showed stellar progress, nearly halving mean stunting prevalence in the 10 years from 2005 to 2015. Conversely, the Northern Province of Zambia, northern Nigeria and southern Niger showed the least gains.
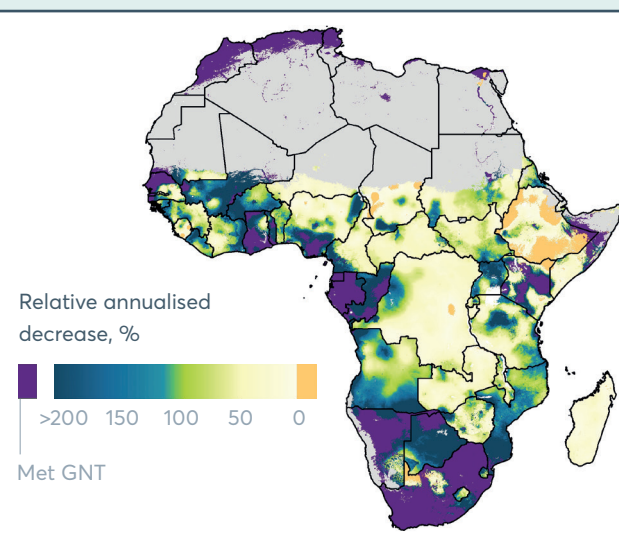
Overall, the results suggest a gloomy outlook. No country in Africa is likely to achieve all the WHO global nutrition targets in all of its territory if current trends continue, emphasising the need to adopt evidence-based, precision public health programmes to track and improve progress. Routine and up-to-date measurement of child growth failure is needed to inform these programmes, and to do so we must continue to fill geographical information gaps and improve data collection.
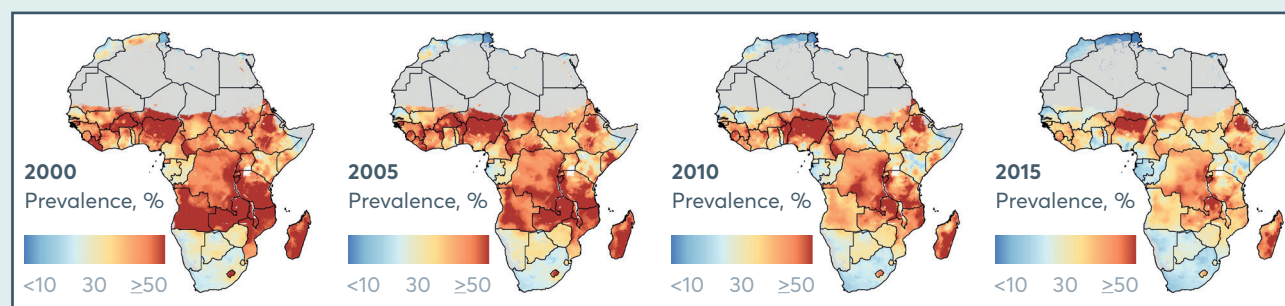
FIGURE 2.10A
Probability that the WHO's moderate and severe stunting target has been achieved in 2015 (5×5-km per pixel level)
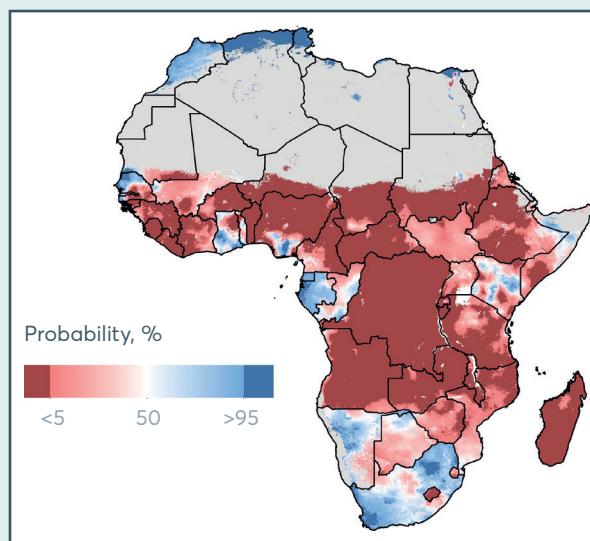
FIGURE 2.10B
Relative annualised decrease in moderate and severe stunting, 2000–2015

Probability, %

<5   50   >95

Relative annualised decrease, %

>200   150   100   50   0

Met GNT

FIGURE 2.10C
Prevalence of moderate and severe stunting, 2000–2015

2000
Prevalence, %

<10   30   ≥50

2005
Prevalence, %

<10   30   ≥50

2010
Prevalence, %

<10   30   ≥50

2015
Prevalence, %

<10   30   ≥50

■ **Source:** Osgood-Zimmerman A., Millear A.I., Stubbs R.W. et al, 2018.[58]

Geospatial data can also be used to analyse the root causes of malnutrition in all its forms, and one study did just that.[59] The International Food Policy Research Institute (IFPRI) used district-level aggregate data from the 2015–2016 National and Family Health Survey covering 601,509 households in 604 districts in India to understand the *causes* of the spatial variation. India holds almost a third (31%) of the world's burden for stunting, and because India is so diverse from state to state, it is important to understand how and why stunting prevalence differs. Researchers used mapping and descriptive analyses to understand spatial differences in distribution of stunting. The mapping showed that stunting varies greatly from district to district (12.4% to 65.1%), with 239 of 604 districts having stunting levels above 40% (Figure 2.11).

Using regression decomposition models, the study compared districts with low (less than 20%) versus high (more than 40%) burdens of stunting and explained over 70% of the difference between high and low-stunting districts. The study found that factors such as women's low BMI accounted for 19% of the difference between the low versus high-burden districts. Other influential gender-related factors included maternal education (accounted for 12%), age at marriage (7%) and antenatal care (6%). Children's diets (9%), assets (7%), open defecation (7%) and household size (5%) were also influential. This study is important in that it reinforced the multisectoral nature of stunting by highlighting that differences between districts were explained by many factors associated with gender, education, economic status, health, hygiene, and other demographic factors. India's national nutrition strategy – which is focused on addressing district-specific factors – draws on analyses such as these along with district-specific nutrition profiles to enable diagnostic work and policy action to reduce inequalities and childhood stunting.

In a world where national-level data on obesity is discouraging, local-level data can be used to identify if and where there is progress. This local-level analysis in high-income countries is showing distinct differences in levels and rates of change in childhood obesity. For example, in the UK, the National Child Measurement Programme measures BMI among all children aged 4–5 years and aged 10–11 years, enabling local authorities to identify where obesity is high, and factors associated with it. The latest data analysis released in 2018 shows that excess weight, obesity, overweight and severe obesity are more common in the most deprived areas compared with the least deprived.[60,61] Amsterdam in the Netherlands tracks childhood obesity in different districts of the city. Based on this data, it has identified target neighbourhoods for reducing obesity among the most disadvantaged children in the city with its Healthy Weight programme. Spotlight 2.7 describes the success this programme is having in tackling obesity among children. In the US, local data shows that obesity is slightly declining in 35 localities. This has facilitated a process of identifying what factors are driving these improvements. Spotlight 2.8 highlights the key findings of the Childhood Obesity Declines Project.
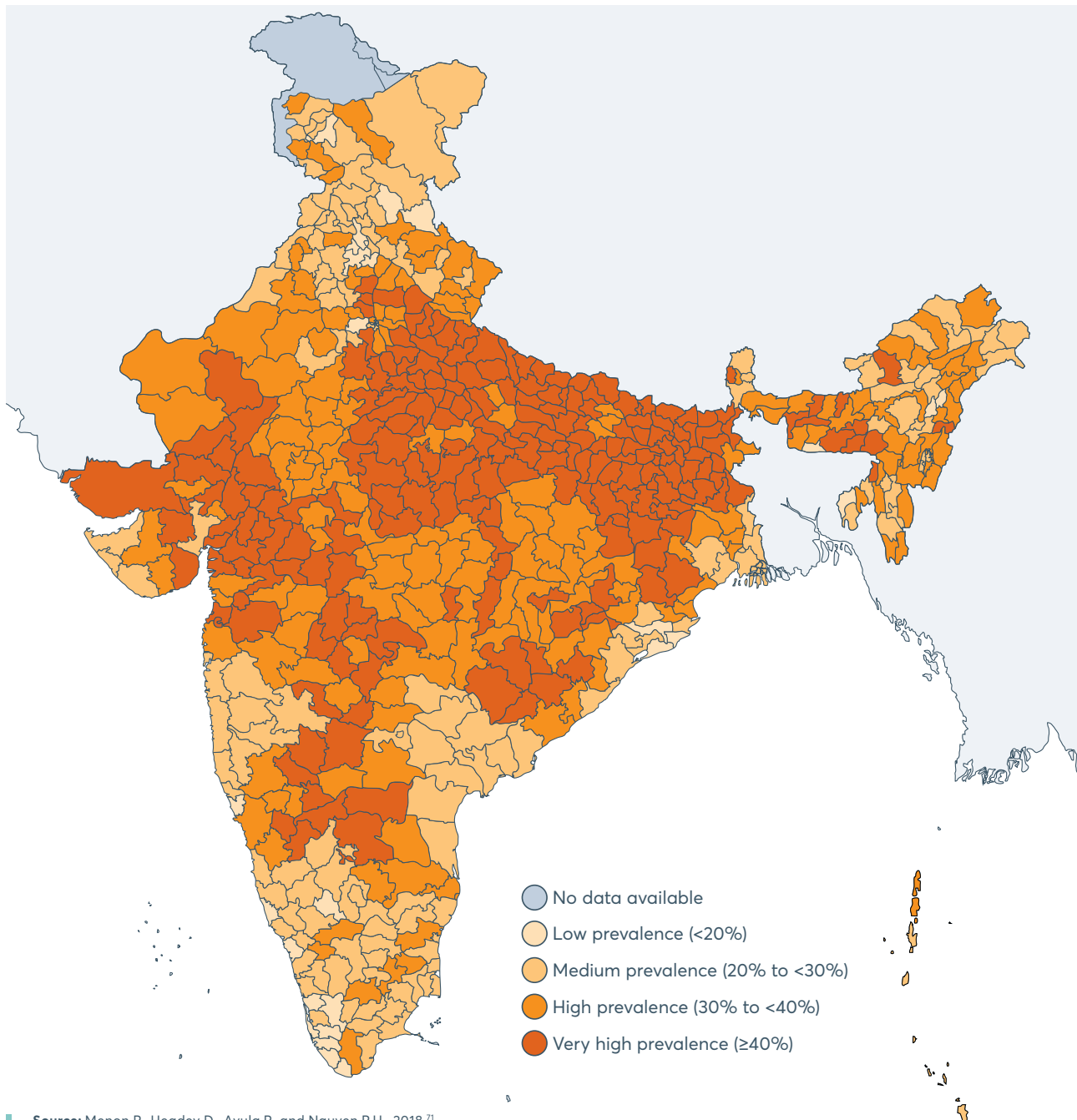
These changes reflect a greater concentration of local-level action in cities around the world to tackle malnutrition in all its forms, including at the city level, as the example of Amsterdam illustrates. New multi-level city initiatives are being designed to tackle obesity, such as the *Pilas con las Vitaminas* programme in Quito, Ecuador,[62] and the Mayor of London's new Child Obesity Taskforce, which is developing an action plan to step up action on obesity in the city. Elsewhere, city networks are being set up to tackle these problems and enable shared learning. The Partnership for Healthy Cities, for example, was established in 2016 to bring together over 50 cities across the world to commit to implementing effective policies, including to promote healthy eating and prevent obesity.[63] Cities Changing Diabetes is another programme being rolled out in several cities across the globe; it assesses the causes of diabetes and then designs and implements interventions to reduce it – on the basis that two thirds of people with diabetes live in cities.[64] The C40 cities network on climate change also has a Food Systems Network which brings together cities taking action on food to improve both diets and environmental sustainability.[65]

Scores of cities around the world have also developed urban food policies designed to tackle different aspects of food-related problems that are not necessarily directly related to malnutrition, but could be levered to address it.[66] 179 cities have now joined the Milan Urban Policy Pact (2015)[67] and many have programmes designed to tackle food insecurity and malnutrition throughout low, middle and high-income country settings, from Dakar to Toronto. For example, the urban agriculture programmes in cities from Antananarivo,[68] Madagascar, to Rosario, Argentina, are providing the land and support needed to start food growing in cities. Lessons learned from these policies and programmes indicate they show promise for urban food policy as a space for improving nutrition.[69,70]

FIGURE 2.11
Maps of stunting prevalence in Indian districts, 2015–2016

- ◯ No data available
- ◯ Low prevalence (<20%)
- ◯ Medium prevalence (20% to <30%)
- ◯ High prevalence (30% to <40%)
- ◯ Very high prevalence (≥40%)

Source: Menon P., Headey D., Avula R. and Nguyen P.H., 2018.[71]

Tackling childhood obesity in the Amsterdam Healthy Weight Programme

Corinna Hawkes

In 2012, Amsterdam realised it faced an obesity crisis among young people, with rates substantially above the Netherlands' national average. Data showed clearly that particular areas of the city were affected, notably those with high levels of low-income children from migrant and minority ethnic backgrounds. The then Deputy Mayor responsible for public health, care and sports quickly saw the gravity of the problem and propelled childhood obesity to the top of the city's agenda. Through him championing the issue, in late 2012 the city council formally committed to Amsterdam's new approach to childhood obesity.

Spurred into action, the authorities devised the Amsterdam Healthy Weight Programme. The vision was clear: for all of Amsterdam's children to have a healthy weight by 2033.[72] The city set two interim targets – the '5,000 metre mission' for all 0–5 year olds to be a healthy weight by 2018 and the 'half marathon mission' for all 0–10 year olds to be a healthy weight by 2023.

From the very start, the programme leadership was placed in the Department of Social Development so that obesity would not be siloed as a purely health issue. It was also treated as a long-term problem with multiple causes at many different levels, requiring shared responsibility among multiple partners. Using the 'rainbow model' of health determinants, they devised a 'whole-system approach' to introduce solutions into the many domains of children's lives.

Actions are broken down by prevention, cure and facilitation. Prevention targets a child's first 1,000 days, pre-school and primary school, neighbourhoods, healthy urban design, food, teenagers, and children with special needs. Cure focuses on helping children who are already overweight or obese to regain a healthier weight. Facilitation covers learning and research, digital tools and communication for professionals. Numerous activities were implemented in the first phase of the programme from 2012 to 2017 including public drinking fountains, restrictions on food advertising in sports stadiums and pools, guidance for healthy snacks in schools, establishment of health ambassadors, treatment of children affected by severe obesity, healthy playgrounds, engagement with food businesses, and healthy eating consultations with parents.[73]

The programme benefitted from having local-level data on childhood obesity that enabled it to identify where the problems were greatest, which led to a focus on five target neighbourhoods. Priority neighbourhoods were assigned a community manager and programme based on their needs. Welfare organisations, civil society, minority ethnic organisations and local shops were brought together to promote healthy lifestyles. Efforts were made to work together to overcome challenges. For example, planners and public health officials had to work together but – at least to start with – had little idea how they impacted on each other's work. Over time, the planning and health departments began collaborating on small-scale activities and eventually on creating healthy public spaces. Physical activity was an important part of this – another example of different disciplines working together came by incorporating 'healthier urban design' into the programme.

There are no evaluations explicitly linking the changes made by the Amsterdam Healthy Weight Programme to changes in obesity. But overweight and obesity prevalence is levelling off, with a decrease in the percentage of children of all age groups between 2012 and 2015 from 21% to 18.5%. The decrease is steeper among groups of very low social economic status than among groups of very high social economic status.[74]

Lessons learned about what made the programme effective are transferrable to other cities. These include strong political leadership; building a programme on the understanding that obesity is a complex problem and that change will happen by learning by doing, and doing by learning; collaboration and commitment across departments; acceptance that change will not happen overnight; combining top-down government intervention with community-led change; targeting the most deprived neighbourhoods; and gathering data for robust monitoring and evaluation.[75]

With the sense of a shared responsibility for reducing obesity now elevated in Amsterdam, the city is continuing its programme of work for 2018 to 2021.[76]

What is driving declines in child obesity in four localities in the US?

Laura Kettel Khan

Childhood obesity is a major problem in the US. Data captured by the National Health and Nutrition Examination Survey (NHANES) shows rates have more than tripled since the 1970s and nearly one in every five school students is now obese.[77] Yet NHANES data from 2003 to 2014 suggests that the rate for children overall may have stabilised at the national level, and there have been some encouraging signs in the past five years with more than 35 US jurisdictions (at the local or state levels) reporting small declines in obesity measures among some segments of their population, including young children from low-income families.[78]

Armed with this data, the National Collaborative on Childhood Obesity Research set up the Child Obesity Declines Project in 2013 to study and document what was driving these declines. The project examines the what, how, when and where of community-based obesity prevention strategies in four selected communities which have experienced very small but statistically significant declines: Anchorage, AK; Granville County, NC; New York, NY; and Philadelphia, PA. Researchers wanted to find out why data showed obesity declining in these communities, and more importantly, to discover what local success stories could potentially be replicated elsewhere.

Using a unique systematic screening and assessment methodology, researchers identified a variety of interventions in these settings, including schools and early childhood education, national, state, local and institutional policies, and wider health and community strategies. For example, banning sugary drinks in Philadelphia schools; serving fresh fruit and vegetables at lunchtime in New York; increasing physical education lessons by 50% in Anchorage; and holding an hour's compulsory physical activity in childcare centres in Granville County. Some of the strategies directly targeted children in schools and childcare centres, while others were aimed at helping low-income children and their families towards healthier behaviour in their neighbourhoods and communities. Strategies were organised according to a socioecologic model – a framework for understanding the various impacts of personal and environmental factors that determine behaviour. Each action was classified according to whether it influenced obesity at the individual, interpersonal, organisational, community or policy level.[79]

While no causal conclusions can be made about the data, there are some pointed patterns of success in these communities across a range of environments. All had similar patterns of strategies that fall in all four quadrants of the socioecologic model, indicating the promise of multi-layered, more intensive strategies; all had strategies that directly targeted younger children in those places such as schools and early childhood education settings where they spend a significant part of their day; and all had 'enabling' strategies that did not directly target children but which increased the opportunity for healthy behaviours by low-income children.

NOTES

Chapter 2

1   Global Nutrition Report, www.globalnutritionreport.org

2   Children aged 0–59 months who are less than -2 standard deviations (SD) from median height-for-age of the WHO Child Growth Standards – a marker for chronic malnutrition.

3   Children aged 0–59 months who are less than -2 SD from median weight-for-height of the WHO Child Growth Standards – a marker for acute malnutrition.

4   Live births in each population and over a given period that weigh less than 2,500 grams.

5   Children aged 0–59 months who are more than two SD from median weight-for-height of the WHO Child Growth Standards – a marker for chronic malnutrition.

6   While in percentage there is a fall, it is possible that, with increase in population, the number may rise in absolute terms or stay the same.

7   Briend A., Khara T. and Dolan C. Wasting and stunting – similarities and differences: policy and programmatic implications. Food and nutrition bulletin, 36(sup. 1), 2015, pp. S15–S23.

8   Emergency Nutrition Network (ENN), 2018. Time to overcome the separation. Available at: www.ennonline.net/attachments/2870/WaSt-policy-brief-June-2018.pdf

9   Olofin I., McDonald C.M., Ezzati M. et al. Associations of suboptimal growth with all-cause and cause-specific mortality in children under five years: a pooled analysis of ten prospective studies. PLoS One, 8:5, 2013, e64636.

10   McDonald C.M., Olofin I., Flaxman S. et al. Nutrition Impact Model Study. The effect of multiple anthropometric deficits on child mortality: meta-analysis of individual data in 10 prospective studies from developing countries. Am J Clin Nutr, 98:4, 2013, 896–901. doi:10.3945/ajcn.112.047639; WHO, 2016. WHA Global Nutrition Targets 2025: Wasting Policy Brief. Available at: wwwwww.who.int/nutrition/topics/globaltargets_wasting_policybrief.pdf

11   The changing nature of wasting statistics means we are unable to present time trends for wasting.

12   Anaemia in pregnant women is defined as a haemoglobin level of <100g/L. For women who are not pregnant, anaemia is defined as a level of 120g/L.

13   Anaemia is used as a proxy indicator for iron deficiency. There are limitations to this because iron deficiency is only one of many causes of anaemia. Kassebaum N.J., Jasrasaria R., Naghavi M. et al. A systematic analysis of global anaemia burden from 1990 to 2010. Blood, 123:5, 2014, pp. 615–624.

14   WHO. Global Health Observatory Data Repository, http://apps.who.int/gho/data/?theme=main (accessed 11 October 2018).

15   NCD Risk Factor Collaboration, http://ncdrisc.org (accessed 11 October 2018).

16   NCD Risk Factor Collaboration (see note 15).

17   Adults aged ≥18 years with diabetes are defined as having fasting glucose ≥7.0 mmol/L, on medication for raised blood glucose, or with a history of diagnosis of diabetes. NCD Risk Factor Collaboration (see note 15).

18   NCD Risk Factor Collaboration (see note 15).

19   WHO, 2018. Noncommunicable diseases country profiles 2018. Available at: www.who.int/nmh/publications/ncd-profiles-2018/en

20   Development Initiatives, 2017. Global Nutrition Report 2017: Nourishing the SDGs. Available at: www.globalnutritionreport.org

21   Salt data for 2010 baseline is from Mozaffarian D., Fahimi S., Singh G.M. et al. Global Sodium Consumption and Death from Cardiovascular Causes. New England Journal of Medicine, 371:7, 2014, pp. 624–634.

22   Women Deliver, 2018. Improve Maternal and Newborn Health and Nutrition (factsheet). Available at: http://womendeliver.org/wp-content/uploads/2016/09/Deliver_For_Good_Brief_13_04.18-MNH.pdf

23   Underweight in adolescents and adults is defined as BMI <18.5 in women aged 20-49, or BMI of less than -2 SD in girls aged 15–19.

24   'Daily average income per person' refers to GNI per capita threshold data, as published by the World Bank and used for country income classifications, divided by the number of days in a year. Available at: https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2018-2019

25   Based on unweighted mean rates in 79 countries.

26   Based on unweighted mean rates in 80 countries.

27   Based on unweighted mean rates in 79 countries.

28   Based on unweighted mean rates in 80 countries.

29   Based on unweighted mean rates in 83 countries.

30   Under-5 stunting, under-5 wasting, under-5 overweight, anaemia, exclusive breastfeeding, adult diabetes (men and women), adult obesity (men and women)

31   Undernourishment refers to the proportion of the population whose dietary energy consumption is less than a pre-determined threshold. People with undernourishment are referred to as undernourished.

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