04

What people eat and why it matters

KEY POINTS

1 Diets are a common cause of malnutrition in all its forms and contribute to disease. They matter for nutrition and health outcomes at all stages of the life cycle.

2 Gaps in the availability and quality of data make it difficult to get a comprehensive picture of what people are eating around the world, but progress has been made in collecting, collating and analysing data, meaning our understanding of diets is improving.

3 The diets of infants and young children, including the extent of breastfeeding and dietary diversity, remain inadequate for good nutrition. New analysis shows there are differences between countries, income groups and urban and rural locations, and improvements are needed to ensure young children have access to nutritious diets in all countries.

4 Regardless of wealth, school-age children, adolescents and adults are eating too many refined grains and sugary foods and drinks, and not enough foods that promote health such as fruits, vegetables and whole grains. A significant proportion of packaged foods fail to meet criteria for foods contributing to positive health outcomes.

5 There is evidence that interventions to improve diets, such as fiscal measures and reformulation, can have positive outcomes. All stakeholders, including governments and businesses, need to take more concerted action to improve diets.

Introduction

In this chapter, we highlight the importance of diet as cause and solution of the global burden of malnutrition. To do so, we explore new and emerging data on the state of diets around the world.

Ensuring access to and consumption of a sufficient quantity of food that is culturally acceptable, affordable, nutritious and healthy for everyone presents a grand challenge as we look towards achieving the Sustainable Development Goals. Current dietary patterns – including the degree to which babies breastfeed – are a common cause of malnutrition in all its forms (Box 4.1).

Large data gaps on exactly what people eat and drink in many countries persist.[1,2] Historically, there have been significant challenges to obtaining adequate diet data in three areas.[3] First, while a few countries have been collecting data on food consumption on a regular basis for some years, reliable information in the vast majority of countries is old or unavailable. Conclusions about what people eat and how dietary patterns have changed over time have thus been based on estimates of national food supply data (what is produced, imported and exported in a country), rather than direct measurement of the food people consume. While numerous studies exist, many have a narrow focus and use different metrics, and therefore produce data of limited use in understanding dietary impacts outside a specific context.

Second, there is no consensus among researchers on a standardised way to measure diets that encompasses all aspects of the diet – adequacy and moderation in quantity, diversity, quality and safety (Box 4.1). Existing metrics developed to provide indicators of household food access and micronutrient intakes, such as dietary diversity scores, were not designed to, and do not capture, other aspects of diets, such as risks to obesity and diet-related non-communicable diseases (NCDs). Some comprehensive metrics have been developed in high-income countries, such as the Alternative Healthy Eating Index and various Mediterranean diet scores but incorporate cultural eating patterns that may not apply directly to low and middle-income countries.

Third, filling data gaps can be costly and intensive work for those people collecting the data and those providing it.

These challenges have led to increasing calls to improve the quality and availability of data.[4] This chapter reviews the steps made to improve data collection, collation and analysis. It shows progress in some critical areas: more collation and analysis of global databases and further efforts to facilitate data collection into the future, more disaggregated analysis, and deeper analysis of data sources on breast milk substitutes and packaged foods. Where possible, the findings from existing data on the diets of infants and young children, adolescents and adults are presented.

The emergence of better data on global diets – the factors influencing nutritional status and what people eat – helps identify critical issues and actions that can be taken by governments, businesses and civil society. For example, new data on the factors influencing variability in the cost and availability of fruits, vegetables, nuts, pulses, animal source foods, oils and fats in different settings and times, is informing the development of more targeted strategies to improve nutrition.

Diets of infants and young children

Optimal nutrition is critical during infancy and early childhood. Adequate diets and related feeding practices are essential to ensure health, growth and development of children to their full potential. There have been steps forward in our ability to understand how infant diets vary between countries, within countries and within wealth groups. UNICEF collates data on eight core 'infant and young child feeding (IYCF) indicators' – four relating to breastfeeding and four to 'complementary feeding' (Table 4.1). In 2016, analysis[5] of these indicators showed comparable data on breastfeeding for high and low-income countries, showing that high-income countries have shorter breastfeeding duration than do low-income and middle-income countries.

Global data shows that fewer than half (42.4%) of all newborns are put to the breast within the first hour of birth (known as 'early initiation'). It also shows that only 40.7% of babies are exclusively breastfed up to the age of six months. Fewer than half of children aged 20 to 23 months (45.1%) get any breast milk.[6] A new initiative launched in 2017 to galvanise international action to improve this – the Global Breastfeeding Collective – also found that progress in actions designed to protect and promote breastfeeding is extremely slow (Spotlight 4.1).

BOX 4.1
A healthy diet

A healthy diet is sufficient and balanced in terms of quantity, quality and safety:

- **Quantity:** sufficient dietary energy to maintain life, support physical activity and maintain a healthy body weight, and enough macro and micronutrients to meet nutrition and health needs, but with without excessive consumption of dietary energy.

- **Quality:** containing diverse nutrient-dense foods from basic food groups including vegetables, fruits, whole grains and cereals, dairy foods and animal and plant-based protein foods, while limiting foods and beverages high in saturated and trans fats, added sugars and salt.

- **Safety:** with foods free from biological, chemical and physical contaminants that lead to food-borne disease.

Based on the available scientific evidence on the link between diet, malnutrition and diseases, the World Health Organization (WHO)[7] recommends the following as a diet that prevents malnutrition in all its forms, as well as NCDs:

- High in fruits, vegetables, legumes (e.g. lentils, beans), nuts and whole grains (e.g. unprocessed maize, millet, oats, brown rice)

- Intake of animal source foods (e.g. dairy, meat, eggs, fish and shellfish) in moderation, and limit processed meats

- Low intake of refined sugars that are added to foods or drinks by the manufacturer, cook or consumer, and concentrated sugars naturally present in honey, syrups, fruit drinks and fruit juice concentrates

- Use of unsaturated fats or vegetable oils (e.g. found in fish, avocado, nuts, sunflower, canola and olive oils) over saturated fats (e.g. found in fatty meat, butter, palm and coconut oil, cream, ghee and lard). Industrial trans fats, or partially hydrogenated oils (found in processed food, fast food, snack food, fried food, baked goods, margarines and spreads) are not part of a healthy diet.

SPOTLIGHT 4.1

Results of the 2017 Global Breastfeeding Scorecard

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A step forward in 2017 to galvanise political and financial support to increase breastfeeding worldwide was the launch of the Global Breastfeeding Collective by UNICEF and WHO.[8] The Collective, a network of 22 international organisations, published a call to action, set seven priorities to improve national support for breastfeeding and introduced a new Global Breastfeeding Scorecard to track these priorities. The results published in 2018 show just how much more work is needed.[9,10] In brief:

- **Funding:** Only seven countries globally receive at least US$5 per birth to support breastfeeding programmes.

- **Regulation of marketing of breast-milk substitutes:** Just 35 of 194 countries have laws to cover all areas of commercial infant formula, while a further 96 are partially covered. Monitoring and enforcement are reportedly weak.

- **Paid maternity leave:** Of 178 countries examined, only 21 meet the criteria of providing at least 18 weeks maternity leave at full pay using social insurance or public funds.

- **Baby-friendly hospitals:** While the vast majority of countries have implemented the Baby-friendly Hospital Initiative at some point, 64 have not assessed or reassessed any facilities in the last five years, suggesting the initiative has become dormant.

- **Breastfeeding counselling:** Most countries reporting this indicator have incorporated infant and young child feeding counselling into at least 75% of their primary healthcare facilities. However, the data does not indicate how many women actually receive counselling.

- **Community support programmes:** Among the 93 countries that reported data, just over half indicated that such programmes existed in more than 75% of districts, but there is no information on how many women are reached with these programmes or on the quality of services provided.

- **National assessments:** Only 83 countries have completed the World Breastfeeding Trends Initiative assessment of breastfeeding policies, programmes and breastfeeding rates in the past five years. Meanwhile 54 countries, mostly high-income ones, have no comparable data on exclusive breastfeeding.

When it comes to solid food, the picture is even more dismal. Fewer than one in five children (15.6%) aged 6 to 24 months eat a minimally acceptable diet. Only two thirds (68.5%) of infants aged 6 to 8 months eat any solid food at all, and more than half (51.2%) of children aged 6 to 24 months do not get the recommended minimum number of meals[11] (Table 4.1).

New analysis of sales data also reveals that a significant (and likely unprecedented) worldwide change in infant and young child diets is underway. Globally, infant formula (0–6 months) sales increased from 7.1kg per infant in 2005 to 11.0kg per infant in 2017, representing a 54.9% (3.9kg) increase. Sales are growing across all regions except North America where there is a modest decline (Figure 4.1). The most significant absolute change in sales is in Asia, driven by China as home to the world's second-largest infant and young child population.[12]

Sales growth is strong not only in standard formula (for consumption by infants aged 0–6 months) but also in the follow-up (7–12 months) and toddler (13–36 months) formula categories, which can displace ongoing breastfeeding if marketed and consumed inappropriately. Because products in these latter categories are often branded, packaged and labelled in ways that resemble infant formula, their marketing may indirectly promote the use of infant formula and could be erroneously introduced in the first six months of life.[13] WHO has long maintained that these milks are unnecessary and supplant the feeding of breast milk.[14]

Despite this dismal picture, there are examples of rapid improvements in the diets of infants and young children from national policies and community-level action. Spotlight 4.2 highlights two such examples of where concerted and concentrated action made a difference.

TABLE 4.1
Indicators of infant and young child feeding practices

INDICATORS	WHAT THEY MEASURE	GLOBAL PREVALENCE (LATEST AVAILABLE DATA BETWEEN 2013–2018)
Early initiation of breastfeeding	Proportion of children born in the last 24 months who were put to the breast within one hour of birth	42.4%
Exclusive breastfeeding under 6 months	Proportion of infants 0–5 months of age who are fed exclusively with breast milk	40.7%
Continued breastfeeding at 1 year	Proportion of children 12–15 months of age who are fed breast milk	71.1%
Continued breastfeeding at 2 years	Proportion of children 20–23 months of age who are fed breast milk	45.1%
Introduction of solid, semi-solid or soft foods	Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods	68.5%
Minimum dietary diversity	Proportion of children 6–23 months of age who received foods from 5 or more food groups during the previous day	25.4%
Minimum meal frequency	Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more	51.2%
Minimum acceptable diet	Proportion of children 6–23 months of age who receive a minimum acceptable diet. Composite indicator of minimum dietary diversity and minimum meal frequency	15.6%

Source: Definitions: WHO.[15] Data: UNICEF, Division of Data Research and Policy (2018), Global UNICEF Global Databases: Infant and Young Child Feeding, New York, May 2018.

FIGURE 4.1
Trends and patterns in per infant/child commercial breast milk substitutes sales by region,* 2005–2017

● Standard (0–6 months)   ● Follow-up (7–12 months)   ● Growing-up (13–36 months)   ● Special (0–6 months)
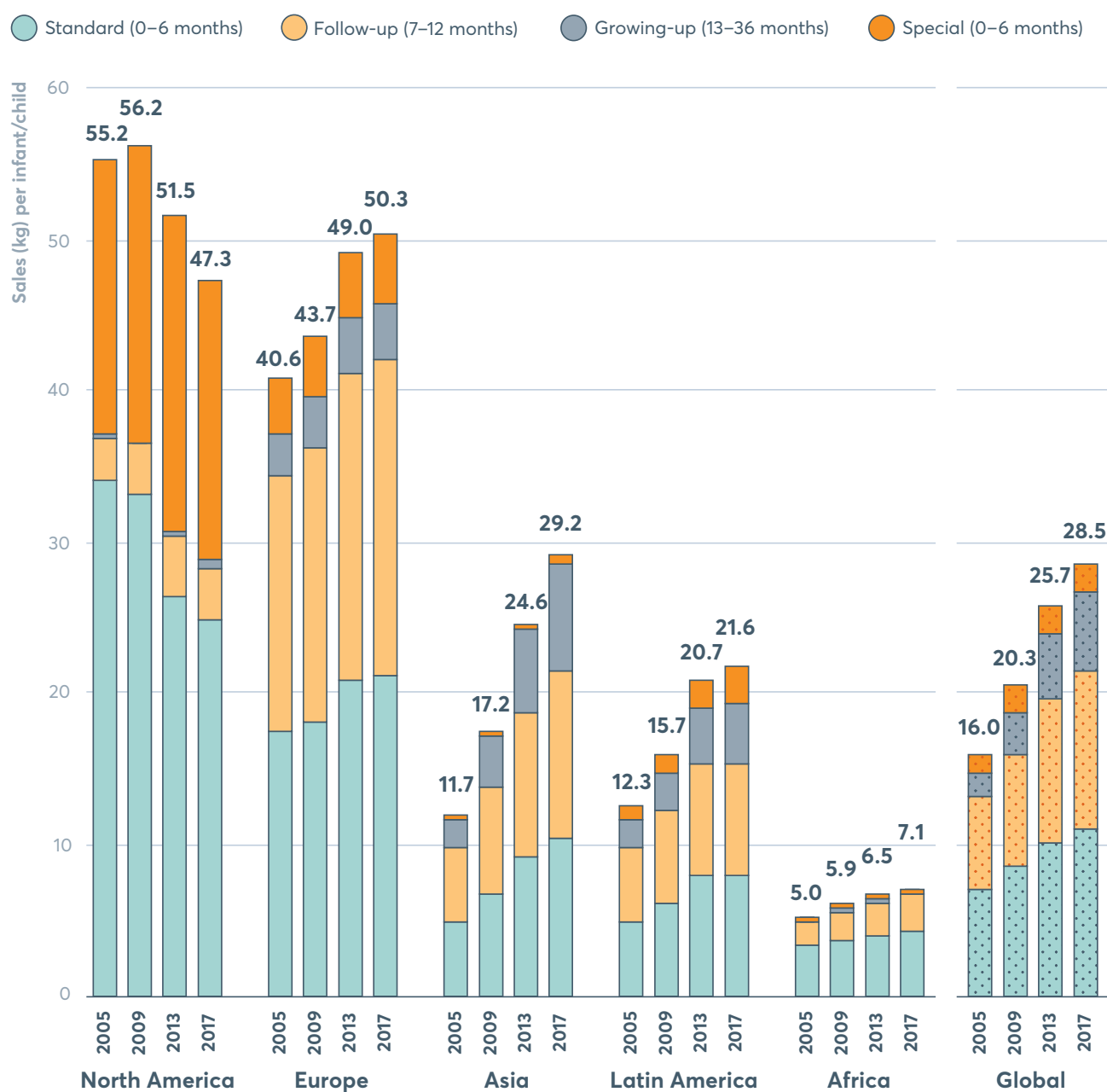
Source: Euromonitor International Market Information Database.[16]
Notes: Standard milk formula = milk formulas in powder and ready-to-drink liquid form, given to infants usually between birth and 6 months (age band defined for each country where possible). Values given are for dry-weight in kilograms. Follow-on milk formula = those in powder and ready-to-drink liquid form, given to babies aged between 7–12 months. Values given are for dry-weight in kilograms. Growing-up milk formula = in powder and ready-to-drink liquid form, given to babies/toddlers from 13 months onwards. Values given are for dry-weight in kilograms. Special baby milk formula = given to babies to prevent or treat allergies to standard milk formula (e.g. soy-based formulas). Values given are for dry-weight in kilograms.
*Excludes data for Oceania because of high volumes of formula purchased in Australia and New Zealand for informal 'grey channel' export to China. Excludes Caribbean islands.

Rapid progress to improve the diet of infants and young children is possible

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Diets among infants and young children are evidently inadequate for good nutrition. Nevertheless, there are encouraging signs that rapid progress is possible at a national and community level. For example, in Burkina Faso[17] throughout the 1990s and early 2000s fewer than one in ten infants under six months of age were exclusively breastfed. Yet the most recent data from 2014 shows that rates have shot up to more than half (Figure 4.2).

The government has shown strong commitment and ownership for all steps of the process. Burkina Faso's 2008 Employment Code now fully complies with the International Labour Organization convention on maternity protection, with legislation requiring women be given 14 weeks of fully state-funded maternity leave. Laws on the marketing of breast-milk substitutes prohibit advertising infant formula, follow-up formula, bottles and teats, and bans samples and gifts to mothers and gifts to healthcare workers.

All primary healthcare facilities now provide individual infant and young child feeding counselling, and 70% of districts have put in place community programmes for breastfeeding. There was a participatory development of the national IYCF plan, which ensured buy-in from all stakeholders and allowed for rapid roll out, with the use of mother support groups as a strong community platform for IYCF interventions.

FIGURE 4.2
Exclusive breastfeeding rates in Burkina Faso, 1992–2014
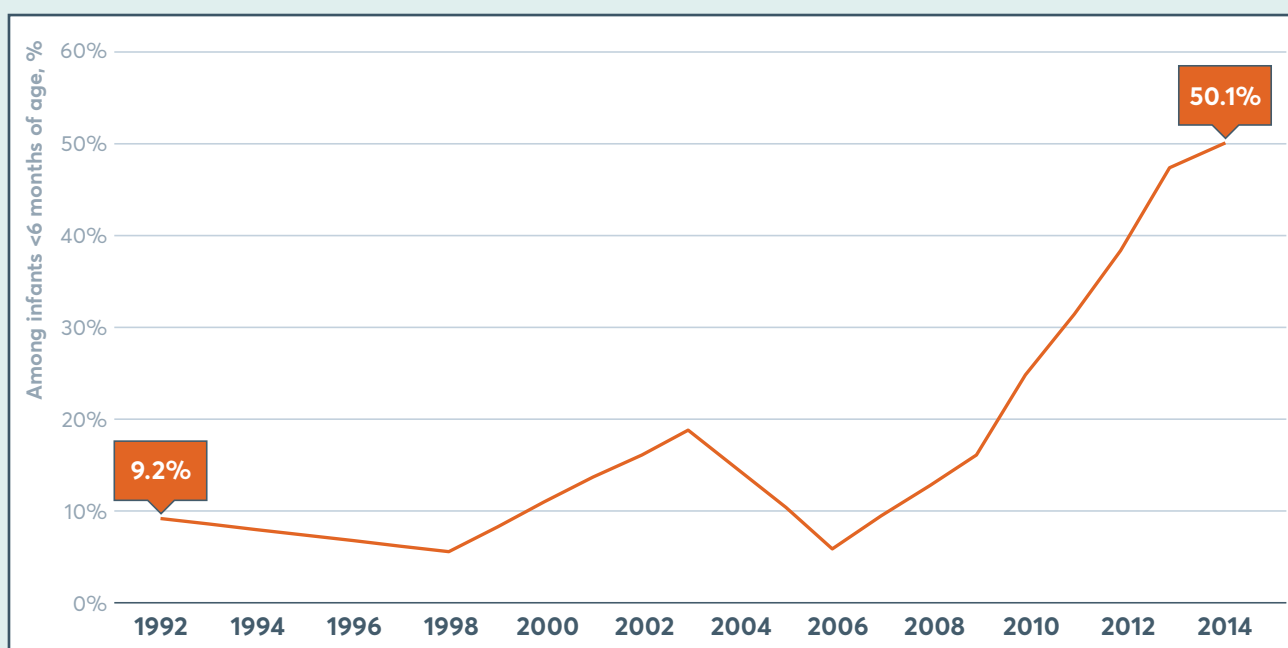
Source: UNICEF, Division of Data Research and Policy (2018). Global UNICEF Global Databases: Infant and Young Child Feeding, New York, May 2018.
Notes: For definitions of terms please see Table 4.1.

An example of a community-based initiative which has also shown very high rates of turnaround is the Alive & Thrive (A&T) initiative, a 12-year initiative to drive innovation, learning and nutrition impact at scale. Initially funded by the Bill & Melinda Gates Foundation, and working with partners and additional funding from the governments of Canada and Ireland, it is guided by a clear framework (Figure 4.3). Originally implemented in Bangladesh, Ethiopia, India and Viet Nam, A&T has expanded its work to new countries such as Burkina Faso, India and Nigeria, regional delivery mechanisms in Southeast Asia and West Africa, interventions for maternal and adolescent nutrition, and delivery channels through agriculture and social protection programmes.

FIGURE 4.3
Framework for implementing infant and young child feeding programmes at scale
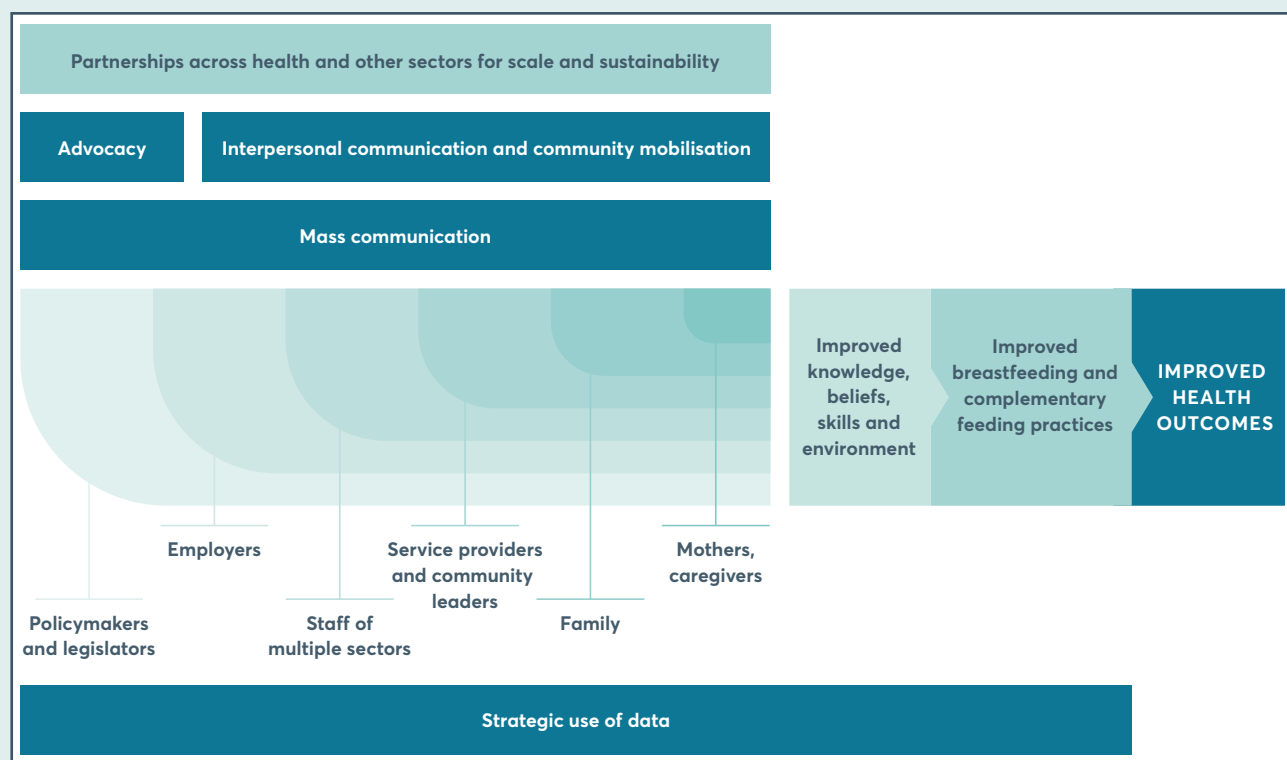
Source: Alive & Thrive, 2016.

Through its early work, A&T reached millions of mothers with children under two years of age through interpersonal and mass communication, and community mobilisation on IYCF. Thousands of trained frontline workers visited mothers at home to help with new behaviours. Mass media was used to drive demand for services and reinforce messages. In Bangladesh, IYCF television and radio spots ran for more than three years, while in Viet Nam, an award-winning TV campaign challenged misperceptions about the adequacy of breast milk and the need for water. A&T worked with BRAC to deliver interventions in Bangladesh. In Ethiopia and Viet Nam, A&T worked through government health systems, introducing the first-ever social franchise model for IYCF in health facilities in Viet Nam.

Systematic measurement, learning and evaluation have been essential. Data drove advocacy, and motivated decision-makers. Insights from diverse data sources, and rigorous monitoring and evaluation, allowed for learning and adjusting implementation. Policy advocacy was a four-part, iterative process to: establish and sustain partnerships, determine the evidence base, develop messages and materials, and create consensus around issues.

A&T is meeting its goal of improving nutrition at scale. Impact evaluations in Bangladesh, Burkina Faso, Ethiopia and Viet Nam showed significant IYCF behaviour changes.[18–21] In Ethiopia, an adapted strategy with agriculture extension workers and religious leaders increased child dietary diversity and contributed to a reduction in stunting (Figure 4.4).

In 2016, A&T commissioned studies to assess how well the original interventions were being delivered and whether behaviour changes were sustained two years after responsibility for all aspects of the programme, including funding, were transitioned to partners in Bangladesh and Viet Nam. Programmes continued, but not surprisingly, were modified, particularly frontline worker home visit and contact frequency. Yet, IYCF practices are better than before the start of the initiative.[22]

A&T has published more than 80 papers documenting its approach and impact. Programme tools are available for others to adapt and use.[23] Most of the important lessons A&T learned are experience-based: plan for scale and sustainability at the outset, build and nurture alliances that leverage the unique skills of each stakeholder, focus on a small set of measurable outcomes and monitor and communicate about them regularly, tailor social and behaviour change strategies based on an understanding of mothers' and communities' realities, derive innovations from those responsible for programmes and nutrition outcomes, and, last but not least, always use data strategically.

FIGURE 4.4
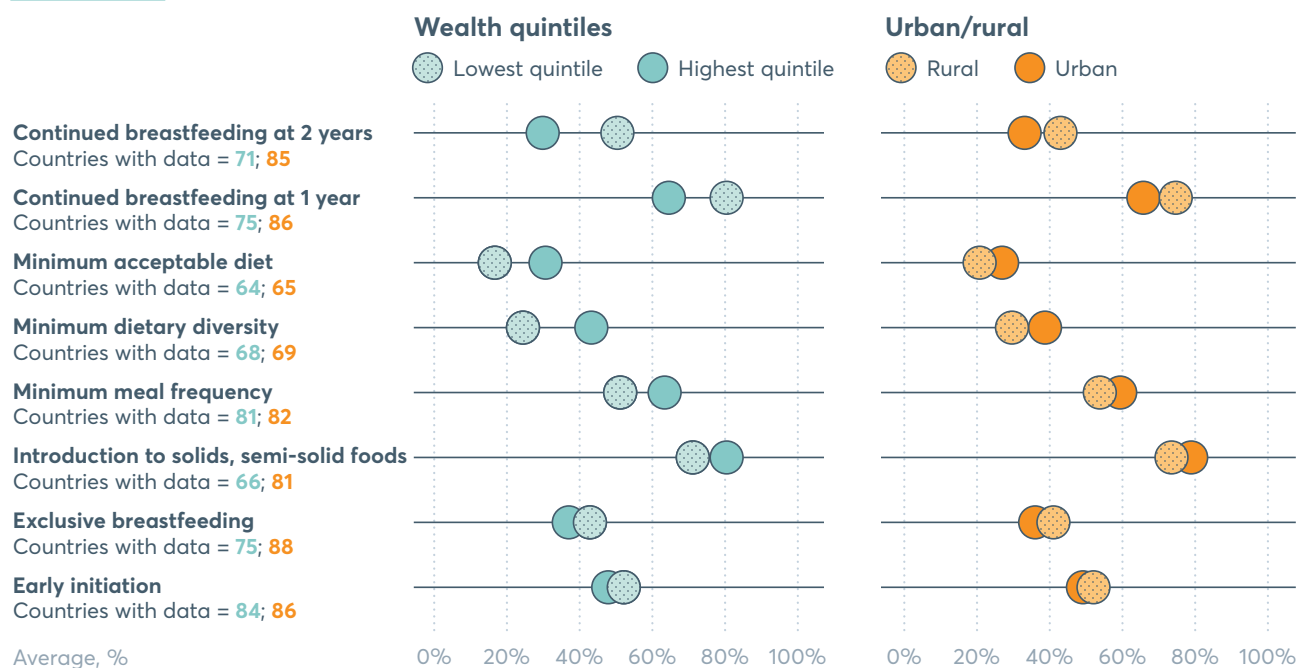Improvements in child dietary diversity and stunting in Ethiopia, 2015–2017
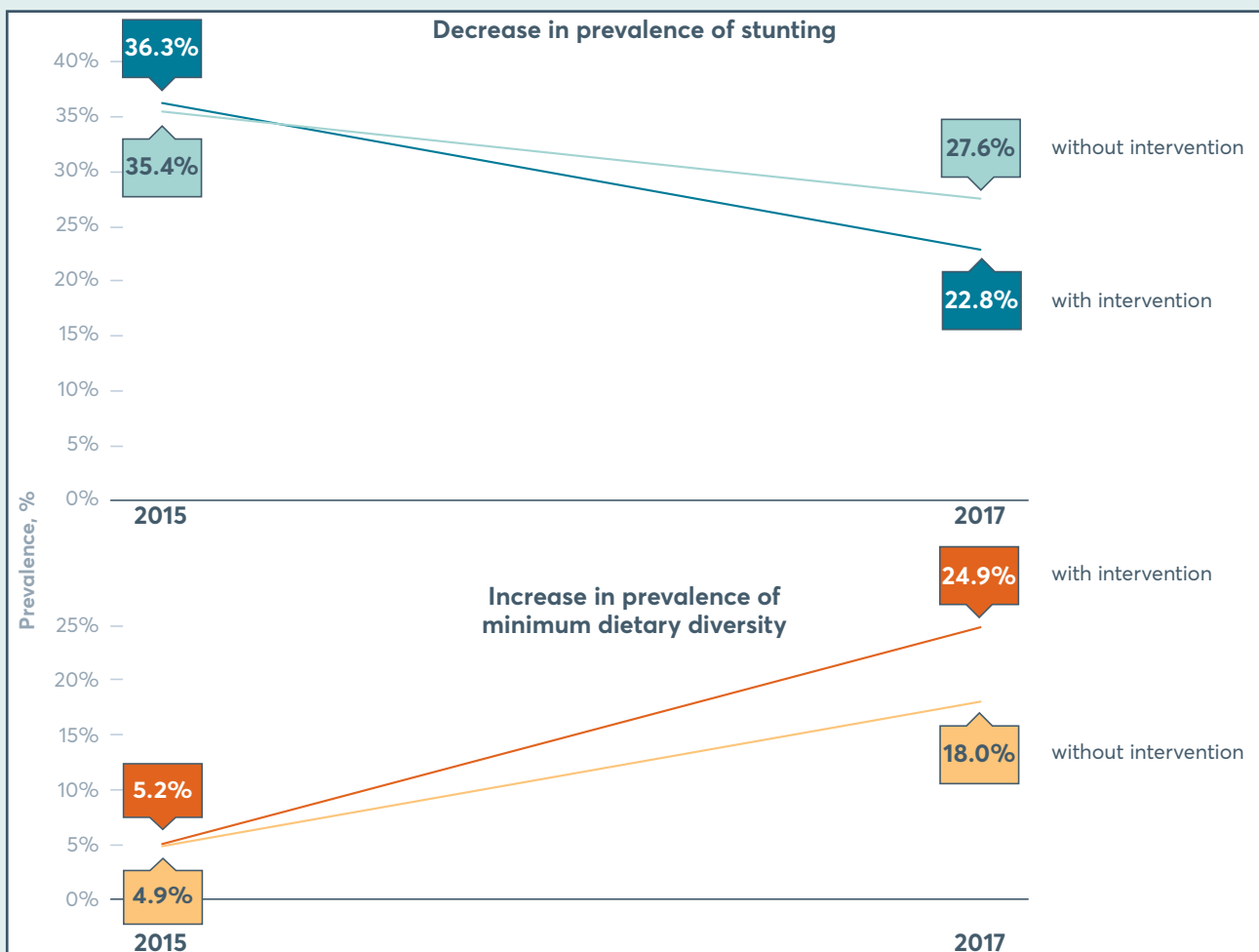
Source: Alive & Thrive, International Food Policy Research Institute, 2018.

In 2017, UNICEF further disaggregated the core set of IYCF indicators by sex, urban/rural, wealth quintile, maternal education and region in the country. This data disaggregation shows there are differences across the IYCF indicators with urban/rural and with wealth.[24] Between urban and rural areas (Figure 4.5), rural areas have better continued breastfeeding (at 1 and 2 years), exclusive breastfeeding, and early initiation of breastfeeding compared with urban areas. Yet urban areas emerge as better than rural in indicators that track minimum acceptable diet, minimum dietary diversity, minimum meal frequency and introduction to solids and semi-solid foods. The gaps between the prevalence of practices are greatest for continued breastfeeding (a difference of 9.8 percentage points for continued breastfeeding at 2 years, and a difference of 8.7 percentage points for continued breastfeeding at 1 year), and minimum dietary diversity – for which rates are greater in urban areas than rural areas by 9.1 percentage points.

When looking at the differences between wealth quintiles (within countries) of complementary feeding practices in Figure 4.5, there is a 14.1 percentage point gap between the lowest and highest wealth quintiles for children with a minimum acceptable diet. Prevalence in the lowest quintile is almost half that reported in the highest quintile. Children from the lowest wealth quintile have 51.4% minimum meal frequency compared with 63.6% in the highest quintile. The same for minimum dietary diversity: highest wealth quintiles have 43.3% minimum dietary diversity whereas children from the lowest quintile have 24.4%. The smallest difference in prevalence between quintiles is reported in early initiation – there is a gap of 4.3 percentage points between the lowest and highest quintile.

FIGURE 4.5
How infant and young child feeding practices differ across wealth quintiles, and urban and rural areas

Source: UNICEF, Division of Data Research and Policy (2018), Global UNICEF Global Databases: Infant and Young Child Feeding, New York, May 2018.
Notes: Based on unweighted means, the latest available since 2011. Includes only countries for which there is comparable data across each indicator.

Owing to the methods of data collection, this data does not capture the extent of intake of packaged, processed foods now more widely available in the marketplace (Figure 4.11), many of which are high in fats, sugars and salt. Independent research indicates that in low and middle-income countries, babies and young children are consuming packaged snack foods such as soft drinks, juice/juice drinks, savoury snacks, sweet biscuits, cakes and sweets on a regular basis, albeit it with significant variation between settings.[25,26]
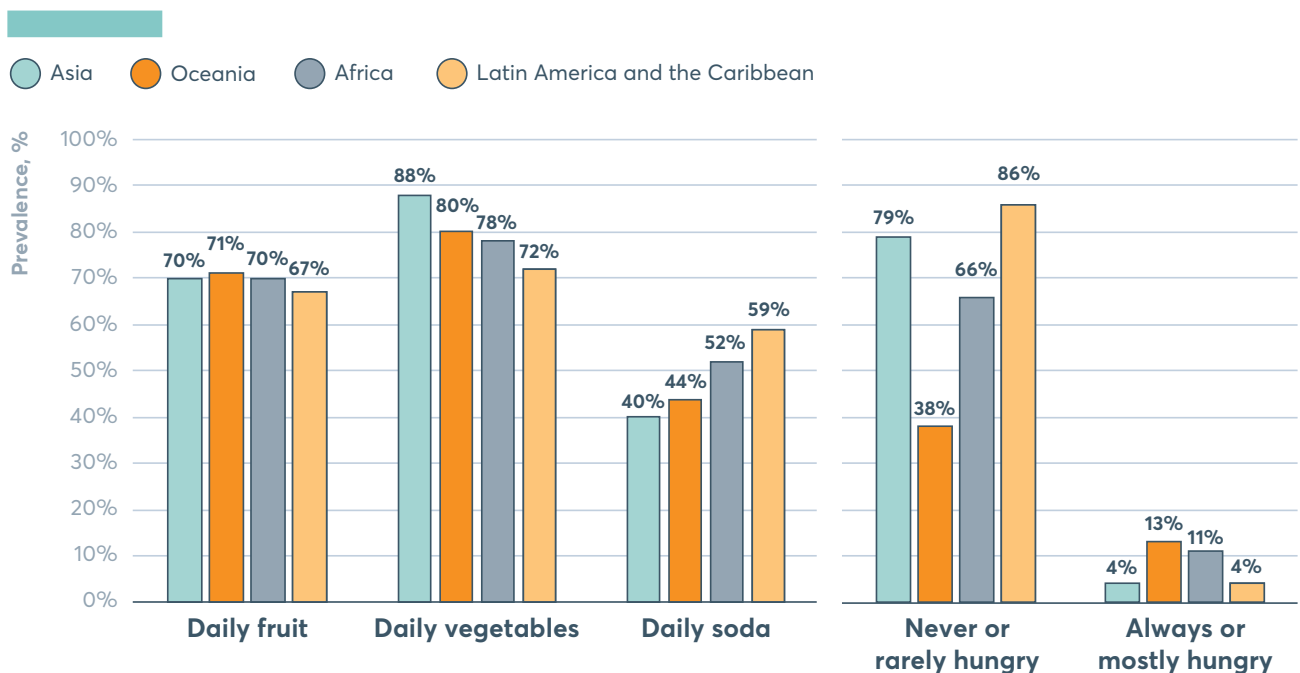
Diets of adolescents

The Global School-based Student Health Survey is a survey on school-age children and adolescents (ages 13–17), developed by WHO and the Centers for Disease Control and Prevention that started in 2003.[27] Resulting datasets compile survey results for 103 economies, comprising 92 countries and 11 territories covering all income groups: 14 low-income countries, 30 lower-middle-income countries, 34 upper-middle-income countries, and 19 high-income countries (six territories do not have income group classifications assigned by the World Bank). The survey offers data disaggregated by boys and girls, and urban and rural. Questions relevant to diet are: how many times per day did you eat fruit or vegetables or soda in the past 30 days? And how often did you experience hunger?

New analysis of this existing dataset shines a light on the diets of young people. As Figure 4.6 shows, on average, 63.3% of school-aged children (aged 13-17) from 83 economies[28] reported eating fruits and vegetables daily. Around a third (30.3%) of young people do not eat fruit daily while 13.9% do not eat vegetables daily and 7.5% of children do not eat fruits and do not eat vegetables daily. Oceania has the highest consumption of fruit and Asia the highest of vegetables. Children in Latin America consume the most soda daily (59.3% compared with Asia at 40.0%), while 43.7% of children reported consuming soda at least once a day. Around 1 in 20 children reported feeling hungry, with more hunger among school-age children in Africa and Oceania.

FIGURE 4.6
Prevalence of daily fruit, vegetable and soda intake among school-age children and adolescents

Source: Global School-based Student Health survey. Data accessed 4 May 2018.
Notes: Based on results from 83 economies with data (on children and adolescents aged 13 to 17 years). Europe has been excluded due to lack of data.

Adult diets

One element improving our understanding of what the world eats has been the development of global databases that collate national and subnational surveys and generate estimates based on dietary data. These can help policymakers better understand what people are eating and how to shape and invest in the public health and food policy agendas of the country.[29] The databases include the Global Dietary Database, the Global Burden of Disease (GBD) and the Food and Agriculture Organization (FAO)/WHO Global Individual Food Consumption Data Tool (GIFT), as well as more analysis of existing global surveys.

The Global Dietary Database and Global Burden of Disease database

Two of the new data platforms are the Global Dietary Database based at Tufts University in the US and the GBD, based at the University of Washington in the US.[30]

These data platforms provide insights into dietary patterns and risk factors for public health research and policy. Systematic global data on dietary intakes is important for quantifying the disease burden that comes from suboptimal diets, and which food groups or nutrients have potential beneficial or harmful risks on disease. It also allows for disaggregation of dietary data by age, sex and time and provides impetus for national governments to improve local and national disaggregated data on diets to support them to identify intervention targets for nutrition programmes and initiatives to reduce the burden of diet-related NCDs.[31]

The Global Nutrition Report presents data from the GBD published in 2016 assessing how different dietary factors can be risk factors and attribute to the burden of disease.[32] Risk factors associated with diet included in the GDB study include: *diet low in* fruits, vegetables, legumes, whole grains, nuts and seeds, fibre, seafood omega-3 fatty acids, polyunsaturated fatty acids, calcium, milk and *diet high in* red meat, processed meat, sugar-sweetened beverages, trans fatty acids and salt.

Sources of the GBD data

To estimate the mean intake of each component of diet, the GBD study uses data from nationally and subnationally representative nutrition surveys and household budget surveys. It also uses sales data from Euromonitor International for fruits, vegetables, legumes, nuts and seeds, red meat, processed meat, milk and sugar-sweetened beverages, as well as data on availability of fruits, vegetables, legumes, nuts and seeds, milk and red meat from FAO food balance sheets. For nutrients, it estimates their national availability by using data from FAO's Supply Utilization Accounts and the US Department of Agriculture's National Nutrition Database for Standard Reference. For each dietary factor, it estimates the age pattern of consumption based on nutrition surveys (i.e. 24-hour diet recall) and applies that age pattern to sales and FAO data. Data from 24-hour dietary recall are considered the gold standard and data from other sources are adjusted accordingly.

Limitations of the GBD data

There are limitations of the GBD data that should be noted. Standardised primary individual-level dietary data collection and analysis is not available in many countries and regions of the world.[33] Thus, the GBD relies on various surveys and modelled data and does secondary data analysis to understand how key dietary indicators relate to undernutrition and NCDs. Dietary data is from mixed sources and is not available for all countries; particularly limited data is available from nationally representative 24-hour dietary recall from developing countries. The 24-hour diet recall is considered the gold standard method of dietary assessment while evidence from validation studies suggests it is not highly reliable due to underreporting of intake. In the absence of national food composition tables, many countries rely on data from other countries

(e.g. US Department of Agriculture food composition tables) to estimate nutrient intake and this approach can under or overestimate the true intake of nutrients in those countries.

Determining risk of dietary factors

The GBD study identified four types of distributions of exposure: theoretical minimum risk, plausible minimum risk, feasible minimum risk and cost-effective minimum risk.[34] For the dietary data, the GBD uses the 'theoretical minimum-risk exposure level' (TMREL). By definition, TMREL is the exposure level (i.e. intake level of a food or nutrient) that minimises the risk of death from all causes related to a single risk factor. The goal was to have an objective approach to estimate the optimal intake for each dietary factor rather than using the conventional, subjective 'expert-opinion' approach. To do so, the GBD study looked across many studies to assess the relationship between each dietary risk and disease endpoint and calculated the level of intake associated with the lowest risk of mortality from that disease endpoint. This gives a disease-specific optimal level of intake. Thereafter, it calculated the TMREL as the weighted average or midpoint of these numbers using the global number of deaths from each disease as the weight.

The GBD study established the minimum risk exposure (TMREL) of 15 dietary factors (Table 4.2).

What the GBD data tells us about how socioeconomic status relates to adult diets

Disaggregating the data by wealth shines a light on the relationship between a country's economic status and intake of certain foods and nutrients. In Figure 4.7, countries from the GBD database were disaggregated across the four country income groups – from low to high income – and the average intake of key food groups and nutrients was examined. The middle

line shows the minimum risk of mortality for these foods and nutrients. If the country income group was to the left of the middle line, it was below the minimum risk threshold; if the group was to the right, it was above.

When data is disaggregated by country income (Figure 4.7), it shows that all income groups exceeded or reached the minimum risk of death (using the measure of TMREL in Table 4.2) of the daily intake of sugar-sweetened beverages and salt. Wealth may not be a guarantee for a healthy diet either – the data from high-income countries shows they are taking in too little of legumes, vegetables, polyunsaturated fats, whole grains, fruit, calcium, milk, nuts and seeds which would minimise their risk of death. High-income countries also exceed the minimum risk exposure for sugar-sweetened beverages, salt, processed meat, red meat, saturated fat, trans fat and omega 3 fatty acids. Low and lower-income countries' intake of legumes exceeded that of upper-middle and high-income countries which indicates a lower risk of mortality associated with that food group. This data indicates that all country income categories are consuming too little of fruits and vegetables – an important source of micronutrients highlighted in Chapter 3.

The consequence of our diets

What the GBD data tells us about the link between diets and disease

The GBD database has also linked these food groups and components with disease using disability-adjusted life years (DALYs – one represents losing the equivalent of one year of full health) (Figure 4.8).[35] The data shows that diets low in fruits, whole grains and nuts and seeds contribute most to the disease burden, and of disease, mostly ischemic heart disease. The data also shows that high intake of salt is a risk factor contributing to DALYs related to ischemic heart disease, stroke and haemorrhages. Ischemic heart disease and diabetes DALYs make up most of those attributable to dietary risks.

TABLE 4.2
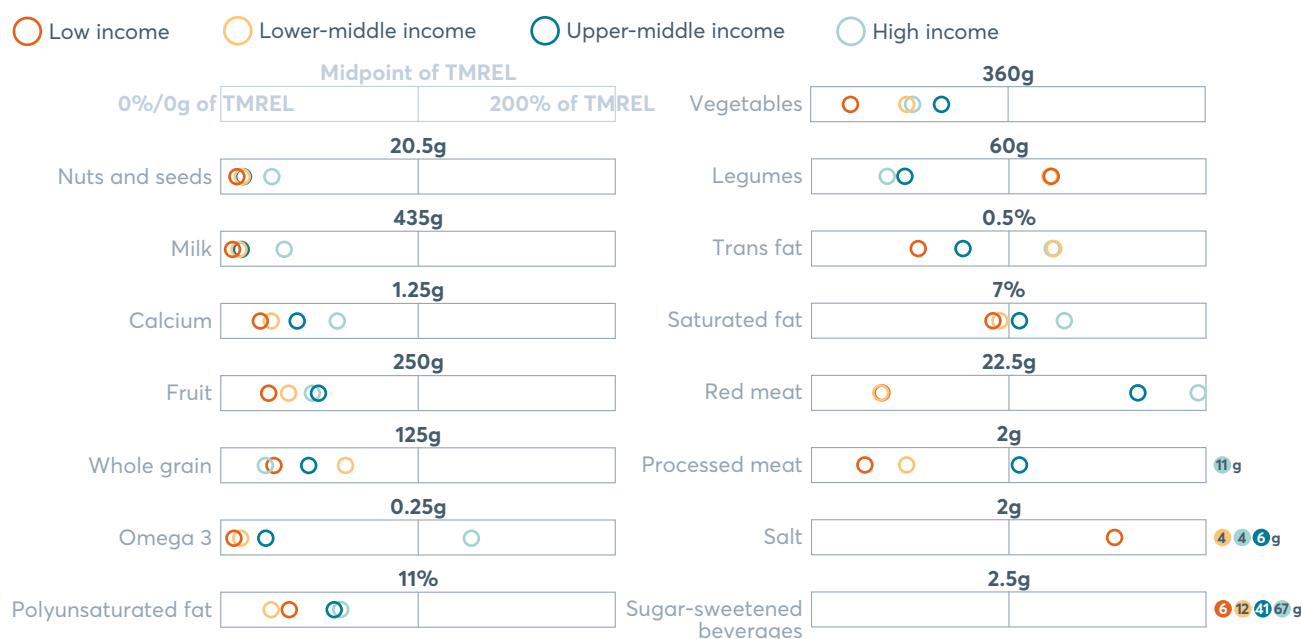Minimum risk exposure (TMREL) of 15 dietary factors

DIETARY 'RISKS'	EXPOSURE DEFINITION	THEORETICAL MINIMUM RISK EXPOSURE LEVEL
Diet low in fruits	Average daily consumption of fruits (fresh, frozen, cooked, canned or dried fruits, excluding fruit juices and salted or pickled fruits)	200–300 grams per day
Diet low in vegetables	Average daily consumption of vegetables (fresh, frozen, cooked, canned or dried vegetables, excluding legumes and salted or pickled vegetables, juices, nuts and seeds and starchy vegetables such as potatoes or corn)	290–430 grams per day
Diet low in legumes	Average daily consumption of legumes (fresh, frozen, cooked, canned or dried legumes)	50–70 grams per day
Diet low in whole grains	Average daily consumption of whole grains (bran, germ and endosperm in their natural proportion) from breakfast cereals, bread, rice, pasta, biscuits, muffins, tortillas, pancakes and other sources	100–150 grams per day
Diet low in nuts and seeds	Average daily consumption of nut and seed foods	16–25 grams per day
Diet low in milk	Average daily consumption of milk including non-fat, low-fat and full-fat milk, excluding soy milk and other plant derivatives	350–520 grams per day
Diet high in red meat	Average daily consumption of red meat (beef, pork, lamb and goat but excluding poultry, fish, eggs and all processed meats)	18–27 grams per day
Diet high in processed meat	Average daily consumption of meat preserved by smoking, curing, salting or addition of chemical preservatives	0–4 grams per day
Diet high in sugar-sweetened beverages	Average daily consumption of beverages with ≥50 kcal per 226.8 gram serving, including carbonated beverages, sodas, energy drinks, fruit drinks, but excluding 100% fruit and vegetable juices	0–5 grams per day
Diet low in fibre	Average daily intake of fibre from all sources including fruits, vegetables, grains, legumes and pulses	19–28 grams per day
Diet low in calcium	Average daily intake of calcium from all sources, including milk, yogurt and cheese	1.00–1.50 grams per day
Diet low in seafood omega-3 fatty acids	Average daily intake of eicosapentaenoic acid and docosahexaenoic acid	200–300 milligrams per day
Diet low in polyunsaturated fatty acids	Average daily intake of omega-6 fatty acids from all sources, mainly liquid vegetable oils, including soybean oil, corn oil and safflower oil	9–13% of total daily energy
Diet high in trans fatty acids	Average daily intake of trans fat from all sources, mainly from partially hydrogenated vegetable oils and ruminant products	0–1% of total daily energy
Diet high in salt	24-hour urinary salt measured in grams per day	0–4 grams per day

Source: Global Burden of Disease, the Institute for Health Metrics and Evaluation.

FIGURE 4.7
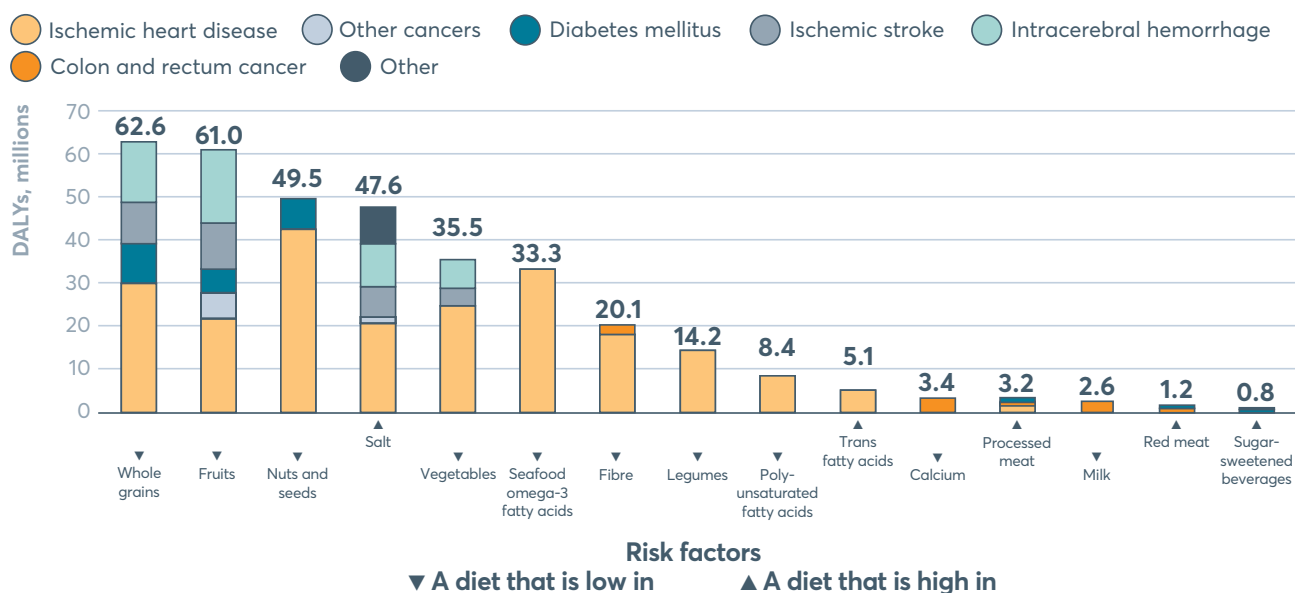Consumption of food groups and components across income groups, 2016

○ Low income   ○ Lower-middle income   ○ Upper-middle income   ○ High income

Source: Global Burden of Disease, the Institute for Health Metrics and Evaluation.
Notes: Men and women aged 25 and older. Chart ordered by mean. TMREL: theoretical minimum risk exposure level.

FIGURE 4.8
DALYs related to each dietary risk factor

○ Ischemic heart disease   ○ Other cancers   ● Diabetes mellitus   ● Ischemic stroke   ○ Intracerebral hemorrhage
● Colon and rectum cancer   ● Other

Risk factors
▼ A diet that is low in   ▲ A diet that is high in

Source: Global Burden of Disease, the Institute for Health Metrics and Evaluation.
Notes: One disability-adjusted life year (DALY) represents losing the equivalent of one year of full health. The total number of DALYS due to diet is less than the sum of the number of DALYs attributable to all individual components because 1) the risk is not additive and 2) the effect of foods are mediated through nutrients.
Other cancers = acute lymphoid leukaemia, acute myeloid leukaemia, breast cancer, chronic lymphoid leukaemia, chronic myeloid leukaemia, gallbladder and biliary tract cancer, kidney cancer, liver cancer due to alcohol use, liver cancer due to hepatitis B, liver cancer due to hepatitis C, liver cancer due to other causes, multiple myeloma, non-Hodgkin lymphoma, oesophageal cancer, other leukaemia, ovarian cancer, pancreatic cancer, thyroid cancer, uterine cancer. Other Alzheimer's disease and other dementias, asthma, atrial fibrillation and flutter, cataract, chronic kidney disease due to diabetes mellitus/glomerulonephritis/hypertension/other causes, gallbladder and biliary diseases, gout, hypertensive heart disease, low back pain, osteoarthritis.

Opening up national-level data on food consumption[36]

Efforts are underway to collate datasets relevant to all forms of malnutrition and make them available for all via an open access platform. This is essential to enable policymakers and implementers to respond to the reality that most countries are dealing with multiple malnutrition challenges.

FAO/WHO GIFT is collating existing subnational and national datasets to provide an open-access platform to make individual quantitative food consumption data from all countries around the world available to anyone who wants it.[37] FAO/WHO GIFT collates global age and sex-disaggregated data collected through individual quantitative 24-hour dietary recalls or records (tools describing all foods and beverages consumed by individuals). The harmonised datasets are shared through the FAO/WHO GIFT platform in the form of microdata and as ready-to-use food-based indicators in three areas: food consumption, nutrition and food safety. There are 5 datasets already available, 11 in the pipeline to be shared and 50 others to be shared within the next 4 years. The FAO/WHO GIFT inventory contains information on 114 surveys conducted in 42 low and lower-middle-income countries. Ultimately, FAO/WHO GIFT aim to create a 'snowball effect', encouraging as many groups as possible to share its data. Further initiatives are also underway to improve and facilitate dietary collection in the future, especially for low and middle-income-country contexts, as illustrated in Spotlight 4.3.

SPOTLIGHT 4.3

Progress in collecting diet data

Mary Arimond, Anna Herforth and Jennifer Coates

A range of new initiatives has emerged in recent years to facilitate the collection of diet data. One exciting new development is the Gallup Diet Quality Worldwide project, a module in the Gallup World Poll aimed at providing comparable global information on adult diets – something that has never been done before. It takes five minutes to complete the survey, which covers minimum dietary diversity for women, a proxy indicator of micronutrient adequacy among women of reproductive age, a dietary diversity score for all adults, and an indicator of diet patterns to protect against diet-related NCDs. The module is being piloted in Brazil in 2018 and will disaggregate, track and compare trends by age, sex and other categories. If successful, the aim is to roll the programme survey out across more than 140 countries by 2021.

The International Dietary Data Expansion (INDDEX) Project[38] is developing INDDEX24 to improve data collection. INDDEX24 is an integrated dietary assessment platform comprising a cloud-based repository for storing, managing and accessing global dietary survey inputs such as food composition data, and a mobile application for conducting interviewer-administered 24-hour dietary recalls on a tablet. These two components are linked so the process of getting actionable dietary data can be faster, standardised and more intuitive. The platform is expected to be available for public use in 2019.

Intake is a new initiative, launched in 2017 by the Center for Dietary Assessment at FHI 360,[39] which aims to support the collection and use of dietary data in low and middle-income countries. It provides flexible and demand-driven technical assistance to meet the challenges of dietary survey and sample design, planning, implementation, analysis and use of data. Intake is developing novel multidimensional metrics of diet quality for women of reproductive age in low and middle-income countries, which do not need food composition data for tabulation thus making them simpler and easier than many 'whole-of-diet' measures previously developed for high-income settings.

Understanding the cost of diets

Another advancement is the new data analyses methods that provide a more accurate picture of the cost of diets[40] and their affordability.[41] For example, the Indicators of Affordability of Nutritious Diets in Africa project (IANDA) is developing metrics using existing data from food price monitoring systems and being tested in Ghana and Tanzania.

Another new development is the Fill the Nutrient Gap tool. Described in Spotlight 4.4, it represents a new method for understanding what people can afford to consume and the potential impacts of the affordability of diets on fulfilling nutrient needs.

Exploring data and trends in packaged, processed foods

Sales data

Packaged, processed foods, such as baked foods, dairy products, sugar-sweetened beverages, processed meats, chips and crackers, cake mixes, pies, pastries and sweets now comprise a significant share of many diets around the world yet there is still relatively little data on their role in diets. New analysis of existing sales data and new data on the nutrient composition of packaged foods is helping to shine a light on the behaviour of consumers in purchasing these foods as well as in their nutrient quality.

SPOTLIGHT 4.4

Fill the Nutrient Gap

Saskia de Pee, Janosch Klemm and Giulia Baldi

Fill the Nutrient Gap (FNG) is a new situation analysis and decision-making process[42] that supports multisectoral decision-making by identifying context-specific challenges to having a nutritious diet. It has been developed by the World Food Programme, with inputs from the International Food Policy Research Institute; University of California, Davis; Harvard University, Epicentre; Mahidol University; UNICEF and Save the Children. FNG identifies the likelihood of nutrient gaps among target groups and categories of households (for example, by wealth or location) and the barriers and opportunities to filling those gaps.

FNG analysis has two components. Firstly, a review of 100–200 secondary sources of information, including datasets, reports and published papers on malnutrition characteristics and trends, availability and physical and economic access to nutritious foods and existing initiatives to improve them, food choices and preferences, and the enabling environment for nutrition. Secondly, a cost-of-the-diet linear programming analysis which estimates, based on prices of locally available foods, the lowest cost of a nutritious diet for different target groups and a household made up of particular members. By comparing this cost with secondary data on household food spending, the proportion of households that cannot afford a nutritious diet can be estimated. The cost-of-the-diet is also used to model potential impact of different interventions to improve availability or access to nutritious foods and income.

Figure 4.9 shows the non-affordability of nutritious diets in 11 countries where FNG has been conducted. The data shows a range of non-affordability depending on the region in each country – for example, across different regions of El Salvador, 9% to 44% of households cannot afford a nutritious diet, whereas the range is much greater in Lao People's Democratic Republic (17% to 95%).

Other data from FNG shows that a nutritious diet for an adolescent girl is often the most expensive in the household due to her higher nutrient needs, particularly for micronutrients, during rapid growth and development. Adolescent girls require nutrient-dense foods (i.e. high in vitamins or minerals per 100 calories), such as animal products, vegetables, nuts, fruits and pulses – which tend to be more expensive. This in turn means that an adolescent girl whose family is already struggling to afford a nutritious diet will run a high risk of micronutrient deficiencies.

FIGURE 4.9
Range of non-affordability of a nutritious diet across areas in different countries[43]

Data for different area of the country

Proportion of households that cannot afford a nutritious diet, %
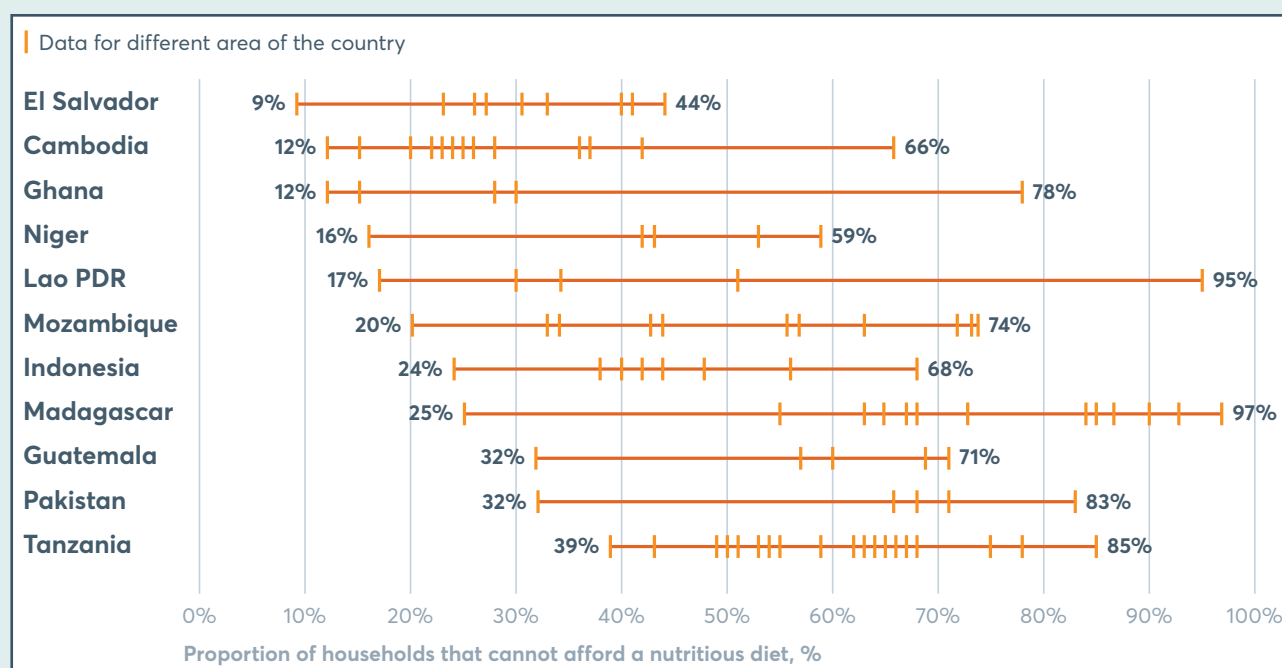
Source: Fill the Nutrient Gap summaries.[44]
Notes: The nutritious diet includes, per person, the average energy needs and the recommended intake for protein, fat, 4 minerals and 9 vitamins. The modelled household size and composition varies by country, but typically includes a breastfed child aged 12–23 months, a school-age child (6–7 years), an adolescent girl (14–15 years), a lactating woman and an adult man. Each data point represents an area of the country. Lao PDR: Lao People's Democratic Republic.
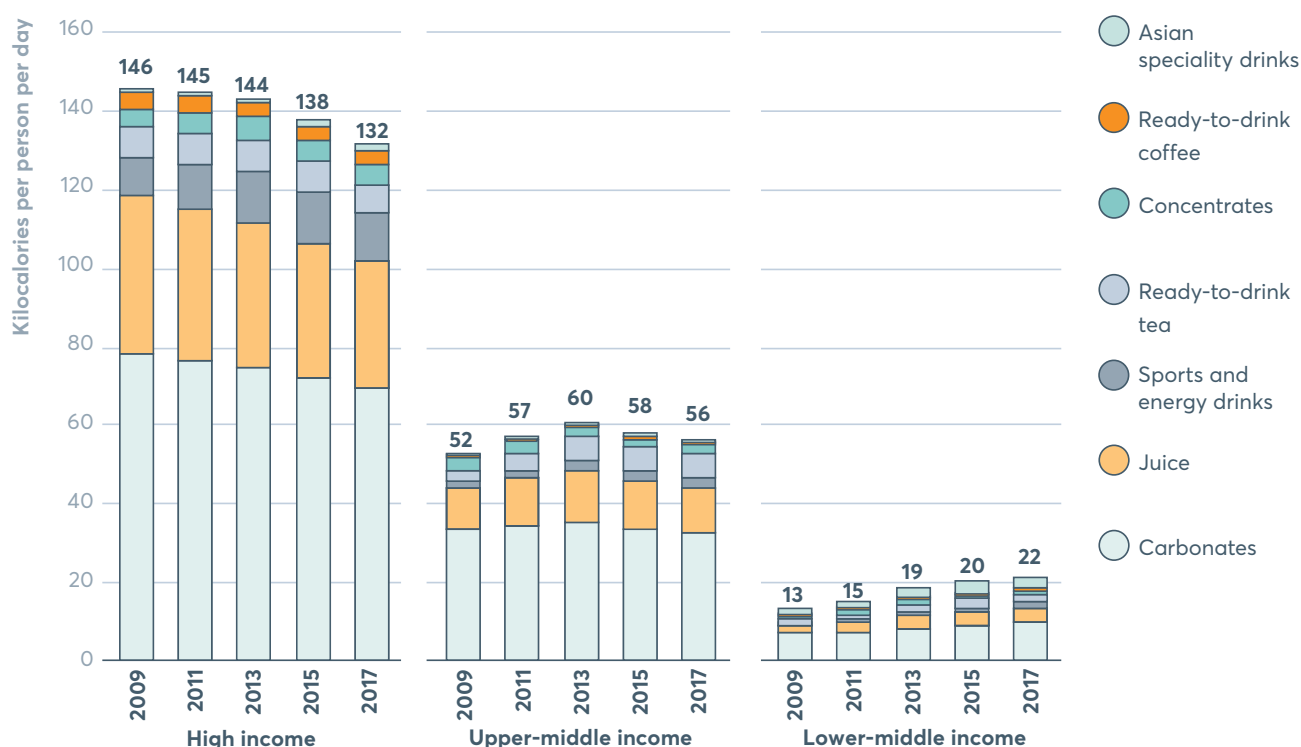
By focusing on ability to meet nutrient intake needs (a prerequisite for reducing malnutrition) and modelling the outcomes of different locally feasible interventions, the potential impact of complementary contributions by different sectors can be assessed and understood. Examples include lowering the prices of locally available nutritious foods, increasing the availability of nutritious foods in specific areas of the country, introducing biofortified crops, fortifying some staple foods, providing home-grown school meals, providing multi-micronutrient supplements to pregnant and lactating women, introducing fortified complementary foods to young children, and modifying social safety nets.

Euromonitor International sales data illuminates some patterns in worldwide purchasing behaviour. For example, the number of kilocalories purchased from sugar-sweetened beverages is highest in high-income countries but many have experienced moderate declines in recent years, whereas lower-middle-income countries have experienced a modest increase (Figure 4.10) over the same period. Figure 4.11 shows patterns and trends in per capita sales volumes in packaged food categories by region. Europe, North America and Oceania purchase the highest volumes of packaged foods, although sales growth is stagnant or declining. In contrast, regions that are home to the bulk of the world's population – Asia and Africa – are undergoing significant growth, albeit from a lower baseline. Globally, sales of total per capita volumes of packaged food rose from 67.7kg per capita in 2005 to 76.9kg in 2017.
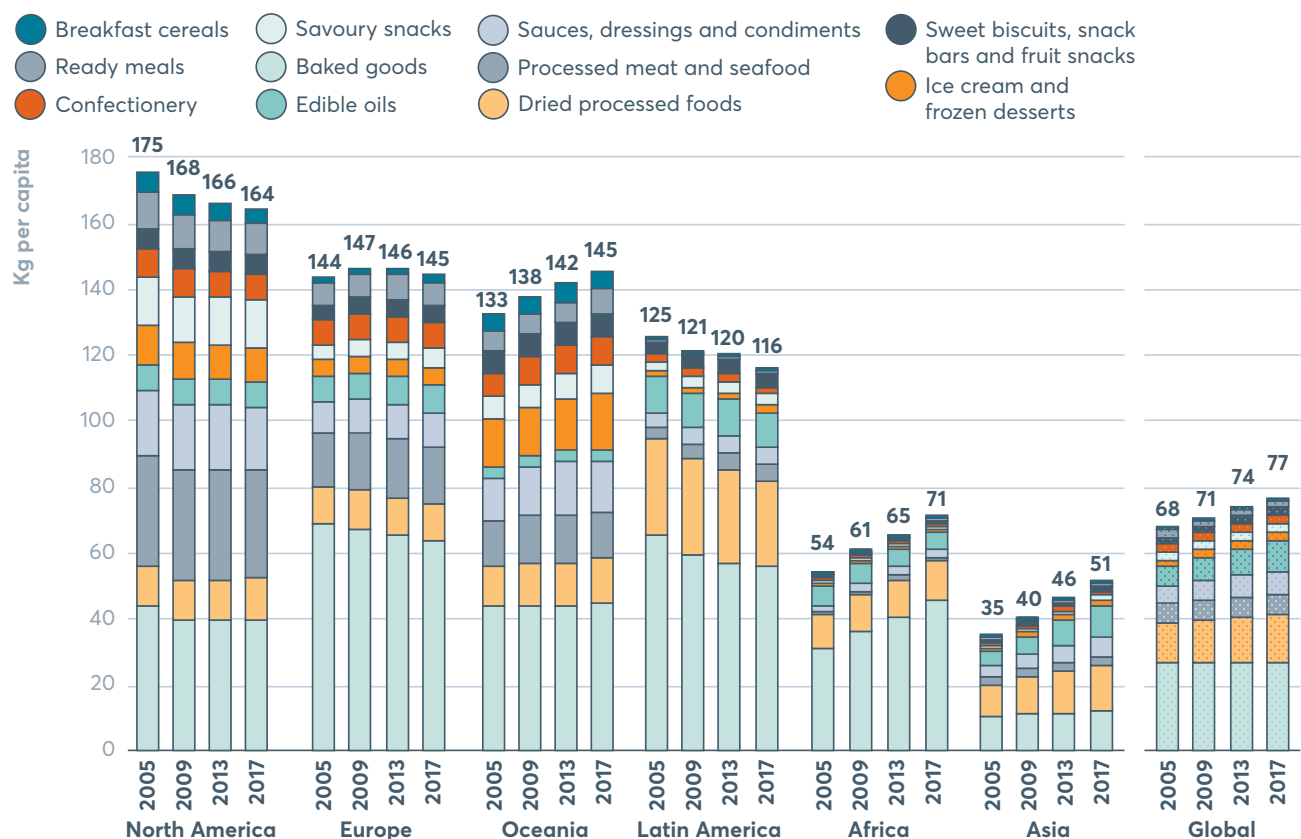
FIGURE 4.10

Trends in energy purchased from sugar-sweetened beverage categories, by country income level

Legend:
- Asian speciality drinks
- Ready-to-drink coffee
- Concentrates
- Ready-to-drink tea
- Sports and energy drinks
- Juice
- Carbonates

High income (Kilocalories per person per day)
2009: 146, 2011: 145, 2013: 144, 2015: 138, 2017: 132

Upper-middle income
2009: 52, 2011: 57, 2013: 60, 2015: 58, 2017: 56

Lower-middle income
2009: 13, 2011: 15, 2013: 19, 2015: 20, 2017: 22

▪ **Source:** Data from the Euromonitor International Market Information Database.[45]

FIGURE 4.11

Trends and patterns in per capita packaged food category sales by region, 2005–2017

Legend:
- Breakfast cereals
- Ready meals
- Confectionery
- Savoury snacks
- Baked goods
- Edible oils
- Sauces, dressings and condiments
- Processed meat and seafood
- Dried processed foods
- Sweet biscuits, snack bars and fruit snacks
- Ice cream and frozen desserts

North America (Kg per capita)
2005: 175, 2009: 168, 2013: 166, 2017: 164

Europe
2005: 144, 2009: 147, 2013: 146, 2017: 145

Oceania
2005: 133, 2009: 138, 2013: 142, 2017: 145

Latin America
2005: 125, 2009: 121, 2013: 120, 2017: 116

Africa
2005: 54, 2009: 61, 2013: 65, 2017: 71

Asia
2005: 35, 2009: 40, 2013: 46, 2017: 51

Global
2005: 68, 2009: 71, 2013: 74, 2017: 77

▪ **Source:** Data is from the Euromonitor International Market Information Database.[46]

Nutrient quality of packaged foods

While the trends in sales of packaged foods are relatively clear, there is widespread debate about how packaged foods contribute to poor diets. These debates centre on the nutrient quality and health impacts of consuming packaged foods which are industrially processed and manufactured from multiple ingredients. For example, some studies[47] conclude this increases the overall dietary content of added or free sugars, saturated and trans-fat, salt and diet energy density, while decreasing protein, dietary fibre, potassium, iron, zinc, magnesium and other micronutrients.[48] Other studies point to an association between intake and obesity,[49] dyslipidemia,[50] hypertension,[51] gastrointestinal disorders[52] and cancer, including breast cancer.[53]

New, large-scale data is helping to inform this debate by providing insights into nutrient content of the packaged foods supply. Since 2015, the George Institute for Global Health, with other partners, has been establishing large databases of the nutrient content of packaged foods, collected using proprietary mobile technology in eight markets: Australia, China, Hong Kong, India, New Zealand, South Africa, the UK and the US. Mexico's Institute for Public Health (INSP) has compiled a similar database.

In 2017, the Access to Nutrition Foundation[54] in partnership with the George Institute for Global Health used these databases to analyse the nutritional quality of 23,013 products sold by 21 of the world's largest food and beverage manufacturers in these nine markets. This 'product profile' is an important new element of the 2018 Global Access to Nutrition Index published in May 2018.[55] Its purpose is to build a picture of the role these companies' products play in consumers' diets and to establish a baseline against which to measure any improvements they make to the nutritional quality of their portfolios over time.

Up to five of the best-selling categories for each company in each country were included in the analysis, based on 2016 sales data from Euromonitor International. Some categories were not eligible for inclusion, such as baby foods, and minimally processed products that typically do not require nutrition labelling on-pack. (For the complete list, and for the full methodology, see the George Institute for Global Health report.[56]) The nutritional quality of each product was determined by applying the Health Star Rating system (developed and used in Australia, but applicable in any market). Products are rated between 0.5 stars (least healthy) to 5 stars (most healthy) and any product that scores 3.5 or above is considered healthy. The Health Star Rating assesses risk nutrients (overall energy, salt, total sugar, saturated fat) and positive nutrients (fruit and vegetable content, protein, fibre and in some cases, calcium), and scores products on the basis of nutritional composition per 100 grams or 100 millilitres.

While the full product profile includes analysis by company,[57] category and country, only the latter is presented here, that is the overall percentage of products in each of the nine countries that was rated as healthy.

Figure 4.12 shows the proportion of packaged food products in each country that has a Health Star Rating of 3.5 or more. These figures range from 37% of the products assessed in New Zealand, 34% in the US and Australia, 31% in the UK, to less than a quarter in South Africa, Mexico, India and China. The results suggest a disparity between developed and emerging markets. On average across all nine markets, 31% of products have a Health Star Rating of 3.5 or more, meaning 69% of products did not meet the healthy threshold and are thus of relatively low nutritional quality.

In 2018 the Access to Nutrition Foundation also published the Global Access to Nutrition Index 2018, which tracks company's policies, management systems and disclosure on seven key nutrition topics, including improving their product portfolio, responsible marketing and labelling and the affordability and accessibility of healthy products.[58] Key findings were that many packaged foods companies have stepped up their efforts to contribute to better diets over the last two years since the last index, as shown by an increase in the average score from 2.5 to 3.3 out of 10. Increasingly, companies' efforts to make and market healthier packaged foods are being embedded in their commercial strategies, rather than their corporate social responsibility

initiatives as was often the case in the past. Demand for products that enable healthy diets is becoming a major growth driver for businesses. However, the low average index score shows that most companies have much room to improve.

Governments are also taking actions to encourage and enable populations to consume fewer packaged, processed foods high in sugars, fats and salt. The ability to track policy actions has been facilitated in recent years by the development of two databases.
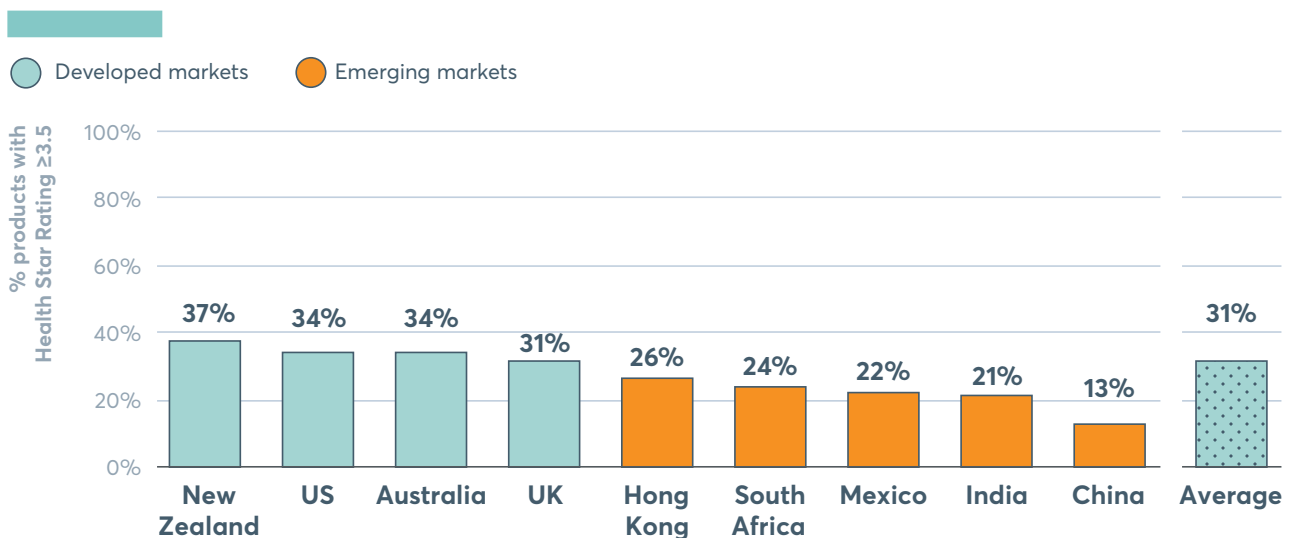
• The WHO Global database on the Implementation of Nutrition Action[59] (GINA), which includes more than 1,000 national policies in 191 countries and various intervention programmes being implemented in countries to promote healthy diets and address malnutrition in all its forms including obesity and diet-related NCDs. During WHO's 2nd Global Nutrition Policy Review in 2016–2017, 163 countries reported on their actions to promote healthy diets, including dietary guidelines, nutrition labelling, reformulation, trans fat ban, regulation of marketing to children, fiscal policies, portion size control, media campaigns and nutrition counselling.

• The World Cancer Research Fund database, NOURISHING, which monitors the implementation of 10 policies designed to improve diets associated with obesity and diet-related NCDs. Actions are reported across three food system domains: food environments, the food supply chain and behaviour change communication including front-of-pack labelling, marketing restrictions, fiscal measures, food reformulation and public awareness campaigns. As of September 2018, it has documented 475 implemented actions from over 100 countries.[60]

Spotlight 4.5 illustrates some of the steps governments are taking, based on analysis of policy actions tracked in these databases. Another important initiative is INFORMAS: the International Network for Food and Obesity/ NCDs Research, Monitoring and Action Support. This is a global network of public-interest organisations and research groups working to enhance knowledge of what governments and businesses are doing to improve diets. INFORMAS monitors and benchmarks efforts to create healthy food environments and rates public and private sector policies and actions to reduce obesity and NCDs based on good practice benchmarks.[61]

FIGURE 4.12
Proportion of packaged food products by country meeting Health Star Rating of 3.5 or more (threshold for 'healthy')

● Developed markets   ● Emerging markets

New Zealand: 37%, US: 34%, Australia: 34%, UK: 31%, Hong Kong: 26%, South Africa: 24%, Mexico: 22%, India: 21%, China: 13%, Average: 31%

(y-axis: % products with Health Star Rating ≥3.5)

SPOTLIGHT 4.5

Government actions on packaged foods and drinks high in fats, sugars and salt

Philip Baker, Kathryn Backholer, Oliver Huse, Jacqui Webster, Lorena Allemandi, Kaia Engesveen and Chizuru Nishida

Governments are using a range of measures on packaged foods and drinks high in fats, sugars and salt These include requiring labelling on food packages, restrictions on marketing, sugar-sweetened beverage taxes and food product reformulation strategies.

For example, more governments now require, or have produced voluntary guidelines on, front-of-pack nutrition labelling alongside the basic nutrient declaration (often referred to as back-of-the pack labels). Chile, Peru and Uruguay, for example, now mandate that foods high in sugars, salt, fats and/or calories carry a front-of-pack warning label. Brazil, Israel and Canada are considering similar actions. Some countries have adopted 'traffic-light' style labels, which provide an indicator on the amount of sugar, fat and salt in foods, including Ecuador, while others have adopted 'scores' which provide an indication of the nutrient quality, such as the NutriScore scheme in France and Belgium.

Since WHO updated its guideline on sugars intake for adults and children in 2015 (recommending that free sugars are limited to less than 10% of total energy intake and further suggesting to reduce to less than 5% of total energy intake for further health benefits),[62] more governments have been taking actions to reduce the affordability and appeal of sugary foods and beverages. One area where there has been a significant increase in the number of implemented policies is sugar-sweetened beverage taxes.[63,64] According to WHO, 59 countries now have such taxes in place.[65] Not all of these appear to have health-related objectives, but there has been a marked increase in adoption in recent years as part of national efforts to address obesity and diet-related NCDs, such as in Ecuador, the Philippines and South Africa. Some countries have adopted tiered or sliding tax designs (i.e. with higher rates on beverages with greater sugar content per unit volume), which aim to incentivise consumers to choose lower sugar options and manufacturers to reformulate products. Example countries include Chile, Ecuador, France, Mexico, Peru, Portugal and the UK. To date, few countries tax 100% fruit juices and sweetened or flavoured milk-based beverages, which are high in free sugars.

Observational studies show that sugar-sweetened beverage taxes are working effectively to achieve their aims. A two-year real-world evaluation of Mexico's 2014 sugar-sweetened beverage tax found that sales of targeted beverages fell by 5.5% a year after taxes were implemented and 9.7% the next year, thereby reducing sales by 7.6% on average over the two-year period.[66] The greatest fall in purchases was seen among households of lower socioeconomic position (17% decline). The two-year follow-up evaluation revealed that consumer response had been sustained.[67] Since this natural experiment in Mexico, a further three such tax evaluations have been conducted in Chile,[68] Berkeley (US)[69] and Philadelphia (US).[70] These have also demonstrated the desired policy effect of reducing sugar-sweetened beverage sales or consumption.

Steps now need to be taken in countries with high levels of sugar purchased from sugar-sweetened beverages but with no tax in place (e.g. Argentina, Australia, Canada, Germany, the Netherlands and New Zealand), highly populated middle-income countries (>100 million people) such as those where levels of sugar intake are low but rising quickly fast (e.g. Indonesia and Viet Nam).

Significant efforts have also been taken to reduce salt consumption in packaged, processed foods. This follows WHO setting a global salt target (to reduce global population salt intake by 30% by 2025, Figure 1.1) as part of the global NCD targets in 2013. Among the 163 countries reporting on actions to promote healthy diets to the 2nd Global Nutrition Policy Review, 77 countries provided detailed information on strategies implemented to reduce salt, including mandatory nutrient declarations, front-of-pack nutrition labelling systems that include salt, mandatory or voluntary reformulation and media campaigns. Most countries implemented either two or three of these strategies simultaneously. These government-led population-wide strategies are cost effective[71] and already demonstrating a positive impact.[72] While most are still in the early stages of implementation, a 2016 Cochrane review highlighted five countries (China, Finland, France, Republic of Ireland and England) that had already demonstrated a significant reduction in salt intake since initiation.[73] Four more countries (Argentina, Belgium, Italy and Portugal) have since reported reductions in salt intake. Together, if implemented effectively, these salt reduction programmes have the potential to avert more than 1.5 million preventable deaths currently attributed to high salt intake in these countries.[74]

Industrially produced trans fatty acids found in packaged foods are also being targeted with certain actions found to be effective. In 2018, WHO developed the REPLACE action package that serves as a tool for countries to act towards eliminating trans fatty acids.[75] It builds on the evidence that a number of countries have virtually eliminated trans fatty acids from the food supply through implementing systematic policy actions and monitoring programmes.[76] Since Denmark became the first country to eliminate industrially produced trans fatty acids from its food supply in 2004, Canada, the US and many countries across Europe have followed.

There has been far less progress in other areas, notably on restrictions on food marketing to children. This is despite evidence that children are highly exposed to food marketing of packaged foods high in sugars, salt and fats. For example, numerous studies in Latin America (e.g. in Argentina, Chile, Mexico and Peru) show that the food categories most frequently advertised to children are sugar-sweetened beverages, desserts, dairy products and savoury snacks. In Argentina, for example, it is estimated that children are exposed to 61 adverts of foods high in salt, sugars and fats per week.[77] Studies in countries such as Uruguay,[78] Chile[79] and Guatemala[80] have also analysed marketing strategies in food packages showing that health-oriented and child-directed strategies are more frequently present in food products with higher content of sugars and energy.

Yet Chile is the only country so far in the region to have implemented mandatory marketing restrictions and just nine other countries globally have put in place partial mandatory restrictions.[81] One positive step forward, however, has been the development of the WHO's regional nutrient profiling models for use and adaptation by governments when developing policies to restrict food marketing to children, now developed for five of the six WHO regions and under development in the remaining region (the African Region). These nutrient profile models are also being adapted by some countries to regulate the promotion and sales of foods and beverages high in fats, sugars, and salt in and around schools.

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43   WFP, 2018 (see note 42).

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45   This figure was prepared by Phillip Baker using data sourced from Euromonitor through an institutional license at Deakin University.

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