

Child-centred food systems: Ensuring healthy diets for children

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It is widely acknowledged that investing in children's nutrition early in life can enhance their survival, health, cognitive function and development potential. Yet there is a growing awareness of how different food systems are driving a double burden of malnutrition¹ and damaging both children's health and the environment.² The high levels of undernutrition in children and the rapidly growing burden of overweight and obesity, if left unchecked, will continue to adversely affect national development. It is therefore essential to locate children within the broader food system, in order to mobilise a collective and coordinated effort to create a food system that supports healthy, affordable and sustainable diets for children and adolescents.

This chapter addresses the following questions:

- What does a healthy diet for children look like?
- Why is it important to adopt a food systems approach?
- What other systems affect children's nutritional status?
- What do we know about the food system in South Africa?
- What are the opportunities to improve the quality of food for children?

What does a healthy diet for children look like?

The right to basic nutrition for children in South Africa is enshrined in section 28 of the Constitution.³ Children who eat enough of the right foods in the right way, at the right time of their development, in healthy environments, are more likely to survive, grow, develop and learn. They are better equipped to thrive, even when faced with disease, disaster or crises.⁴ Children in the first six months of life get their perfect nutritional requirements from breast milk. Thereafter, complementary foods appropriate for their developmental stage should be added until the child can share family food. A healthy diet for children should be diverse (see Box 3), including at least five of the eight food groups daily. Preference should be given to nutrient-dense foods and caregivers should try to avoid providing foods with low nutritional value such as sugar-sweetened beverages, candy,

Box 3: A healthy diet for infants and children

A healthy diet should include a diverse mix of foods from different food groups each day:

1. Breastmilk
2. Grains, roots and tubers
3. Legumes, nuts and seeds
4. Dairy (milk, yoghurt, cheese)
5. Modest amounts of flesh foods (meats, fish, poultry, and liver or organ meats)
6. Eggs
7. Vitamin A-rich fruits and vegetables (carrots, mangoes, dark green leafy vegetables, pumpkins, orange sweet potato)
8. Other types of fruits and vegetables⁴



chips and other foods high in sugar, salt and trans fats.⁵ Adding sugar to home-cooked foods should be avoided as it may set lifelong taste preferences.⁴ These guidelines are reflected in South Africa's age-specific Paediatric Food-Based Dietary Guidelines (PFBDGs), which were published in 2013⁶ but never officially adopted by the Department of Health.⁷

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While the guidelines for healthy eating are clear, children's health, nutrition and food choices are shaped and constrained in powerful ways by the broader food system

Why is it important to adopt a food systems approach?

In 2018, UNICEF and the Global Alliance for Improved Nutrition hosted a global consultation to identify what is needed to create a child- and adolescent-centred food system. They recognised that actors in the food system rarely consider the needs of children and adolescents and that children's food choices are increasingly shaped by food environments that are flooded by cheap, unhealthy food. More nutritious foods are often not available, accessible or affordable. Therefore they chose to adopt a food systems approach in order to harness collective action across the food system to support healthy, affordable and sustainable diets for children and adolescents.

The food system comprises "all the elements and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes".⁸ This includes complex interactions between the environment, people, inputs, processes, infrastructure and institutions across the food system, including how food supply chains and local food environments have a powerful influence on consumer behaviour as illustrated in Figure 6.

1. **Food supply chains** include all the activities involved in taking food from producers to consumers - from food production, storage, distribution, processing, packaging, retail and markets through to the disposal or recycling of waste and packaging.

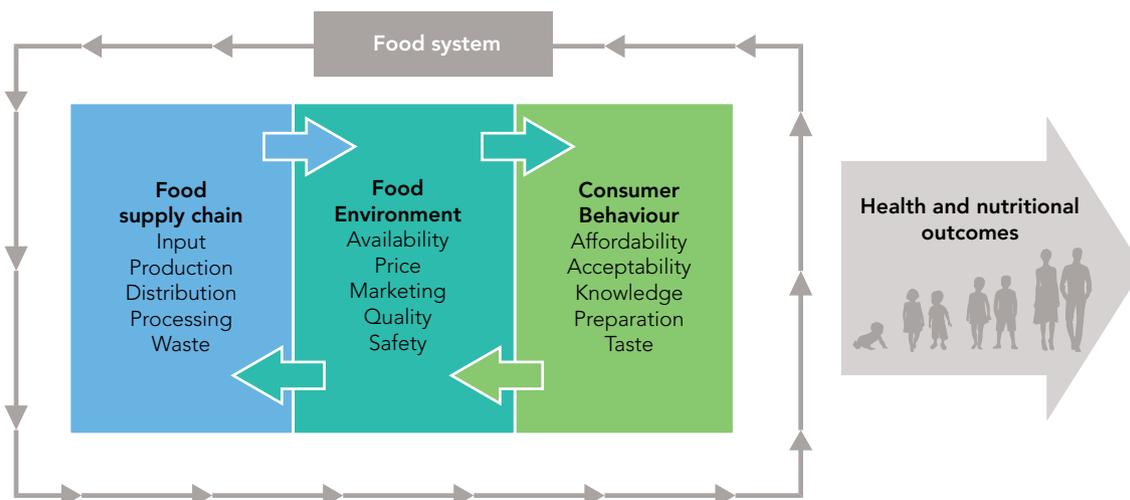
2. **Food environments**⁹ are market-driven, and the availability of both healthy and unhealthy foods is influenced by food suppliers (such as shops, markets, fast-food outlets and traders), food prices, marketing and regulations.
3. **Consumer behaviour** describes how people acquire, prepare and consume food. These behaviours are constrained by consumers' purchasing power and food preferences, including which foods they find affordable, accessible, convenient and desirable.

Children's dietary practices are also shaped by their care context as parents, caregivers, schools and early childhood development (ECD) programmes often act as gatekeepers, taking responsibility for procuring and preparing food and supervising the eating practices of younger children, while older children and adolescents are more independent.

Ideally, food systems should underpin all six dimensions of food security, as outlined in Chapter 1. In other words, nutritious food should be available, physically and economically accessible to all, safely and appropriately utilised, and stable and resilient in times of stress and shock. In addition, food systems should be empowering and enable the most marginalised to participate in decision-making and they should be environmentally, socially and economically sustainable.

In 2018, The Economics of Ecosystems and Biodiversity (TEEB) elaborated on the food system framework focusing on the processes and invisible positive and negative flows of resources within the food system,¹ rather than the individual consumer. They highlighted the complexity and interconnectedness of food systems and how actions and changes have repercussions across the system.¹⁰ For example,

Figure 6: Key drivers of the food system



Adapted from: Turner C, Aggarwal A, Walls H, Herforth A, Drewnowski A, Coates J, et al. Concepts and critical perspectives for food environment research: A global framework with implications for action in low-and middle-income countries. *Global Food Security*. 2018;18:93-101.

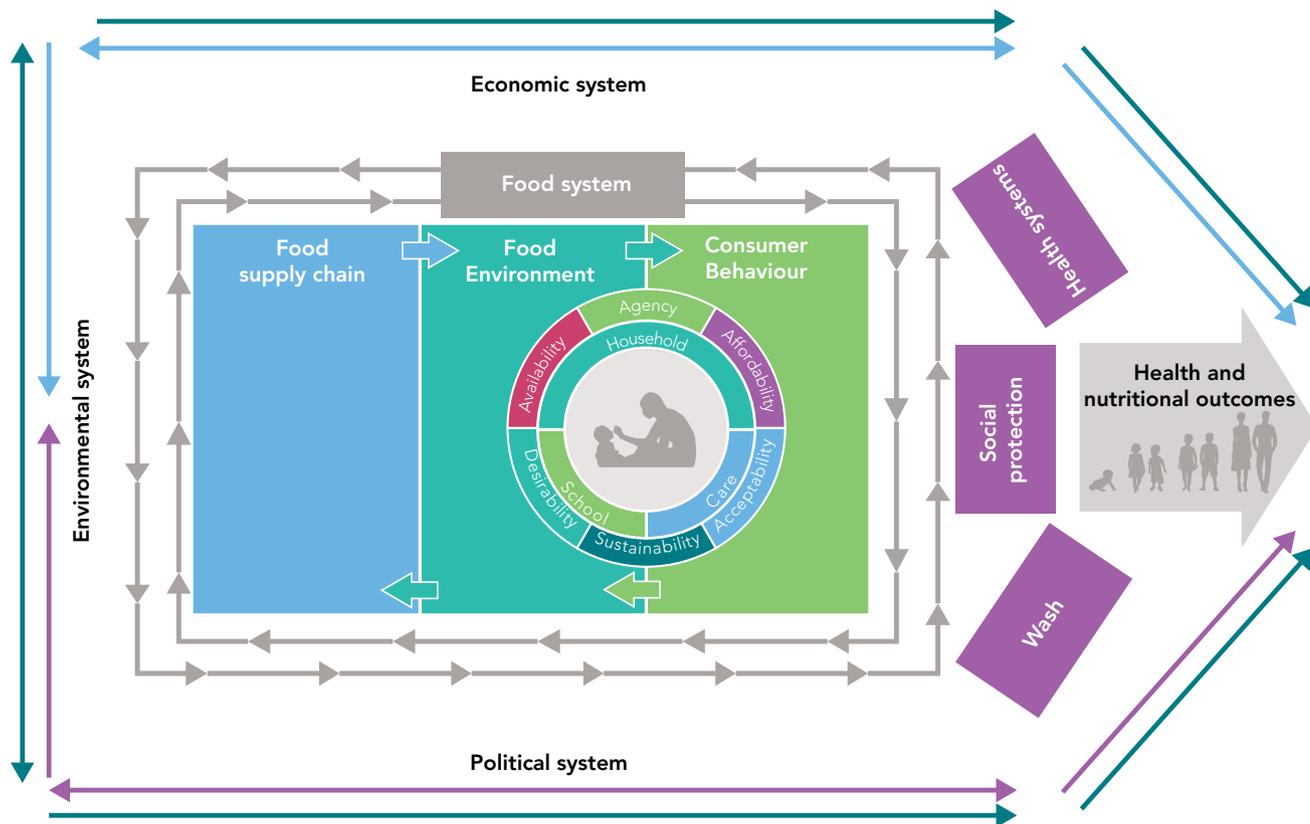
food producers' decisions and consumers' food choices are directly shaped by the broader social, political and economic forces impacting food systems. Similarly, producer and consumer decisions and choices can influence the food system through the principles of supply and demand.

Multiple food systems can co-exist.¹¹ For example, breastfeeding is a short supply chain where the mother (food supply) and the infant (consumer) are directly linked.¹² It can take place within a household that prepares and sells "vetkoek" and fizzy drinks at the local school, where they are simultaneously creating their own livelihood and contributing to the food environment for school children.¹³

Figure 7 illustrates the complex multi-dimensional feedback system that shapes the health and nutrition outcomes of children. The food available to children, children's care contexts and the six dimensions of food security have been integrated and then positioned at the intersection of food environments and consumer behaviour to highlight how they shape and are shaped by these two sub-systems. Unfortunately, the forces that shape (and continuously reshape) the food system have

increased the distance between consumers and the source of their food. This increased distance does not necessarily imply a longer physical distance, but rather indicates an increase in the number of actors in the food chain.¹⁴ It also does not imply that food has become less accessible. Instead, there has been an increase both in volume and in the number of choices available. Yet, this longer distance has led to more processed food and food that is less healthy for both humans and the environment. Economies of scale also mean that these ultra-processed foods are often cheaper than healthy foods, so that children in poor households have no choice other than to consume cheap, unhealthy diets. In other words, the desirability of food is shaped by structural determinants within and beyond the food system. As Friel puts it, "what, when, where and how much people eat does not happen by accident".¹⁵ The corporatization of the global food system has created the conditions that are cultivating the excess consumption of cheap, unhealthy food and beverages, manufacturing the epidemic of non-communicable diseases (NCDs) and harming the environment.^{2, 15, 16}

Figure 7: Diagrammatic illustration of systems and forces affecting the diet quality and quantity of children



Adapted from concepts in: Turner C, Aggarwal A, Walls H, Herforth A, Drewnowski A, Coates J, . . . Kadiyala S. Concepts and critical perspectives for food environment research: A global framework with implications for action in low-and middle-income countries. *Global Food Security*. 2018;18:93-101; UNICEF. UNICEF Nutrition Guidance: Improving children's diets during the complementary feeding period. New York: UNICEF. 2020; HLPE. Nutrition and food systems. HLPE Report #12. Rome: A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. 2017; HLPE. Food security and nutrition: Building a global narrative towards 2030. HLPE Report #15. Rome: A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. 2020.

Case 2: How primary caregivers of children on the Child Support Grant access food in Mount Frere, Eastern Cape

A study conducted between 2014 and 2015⁶² in rural Mount Frere with primary caregivers of children in receipt of the Child Support Grant, demonstrates a markedly different food system landscape compared to urban areas. In this part of the world infrastructural constraints influence the decisions and choices caregivers make about what food to buy and where to buy it. Study findings showed that in 2015 accessing food in Mt Frere came with high transport costs –the average caregiver lived about 15kms from town and paid at least R10 each way for herself and then R4 for each big grocery item (e.g 10kg mealie-meal, sugar). This led to some caregivers opting to buy bulk items in nearby village shops even though the prices were higher, and only buying smaller food items such as soups, canned food, meat/meat products in town.

Another infrastructural issue that plagued many caregivers in the rural town was a lack of electricity in many of the town's villages. In this rural setting, caregivers' ability to access and provide diverse diets for their children was impeded by issues that went beyond food prices, such as food storage concerns. Caregivers did not only have to contend with the cost of a fridge (which many cited as too high) but had to deal with the lack of electricity even when they had a fridge.

"I do have a fridge, but I do not have electricity so I cannot use my fridge, so I would need to take the food that needs a fridge to a friend who has electricity....." (CSG Recipient, Mt Frere)

For caregivers who lived closer to town, the choice of where to buy groceries was influenced mainly by price and

perceived freshness of the food items, and so caregivers go to different shops for different grocery items

"I buy mealie meal, flour, rice, potatoes, butternut, cooking oil, samp, onion, carrots. I buy a few things....[at Boxer stores]...I buy at Shoprite as well [because] the veg at Shoprite looks fresh almost every time I buy it and they sometimes have certain items on sale." (CSG recipient, Mt Frere)

Many households ran out of food before the end of the month, barely making it to the next grant payment.

"It is always on the last week where you totally run out and you realise that wow, things are bad. That last week is the worst maybe you have mealie-meal but you do not have sugar." (CSG recipient, Mt Frere)

During these periods, women demonstrated resourcefulness when they ran out of food; they leveraged the grant in reciprocal exchanges that kept them from destitution.

"We ask around in the village, maybe someone you know, like a neighbour. You say, "Can you please give me some maize meal", you know that you are going to mix that with whatever you have in the house, maybe next time she will also need the same from you...we swap items – maybe you have mealie-meal or potatoes and maybe that is just what she needs. We try and make it to the day we get paid." (CSG recipient, Mt Frere)

What other systems affect children's diets and nutritional status?

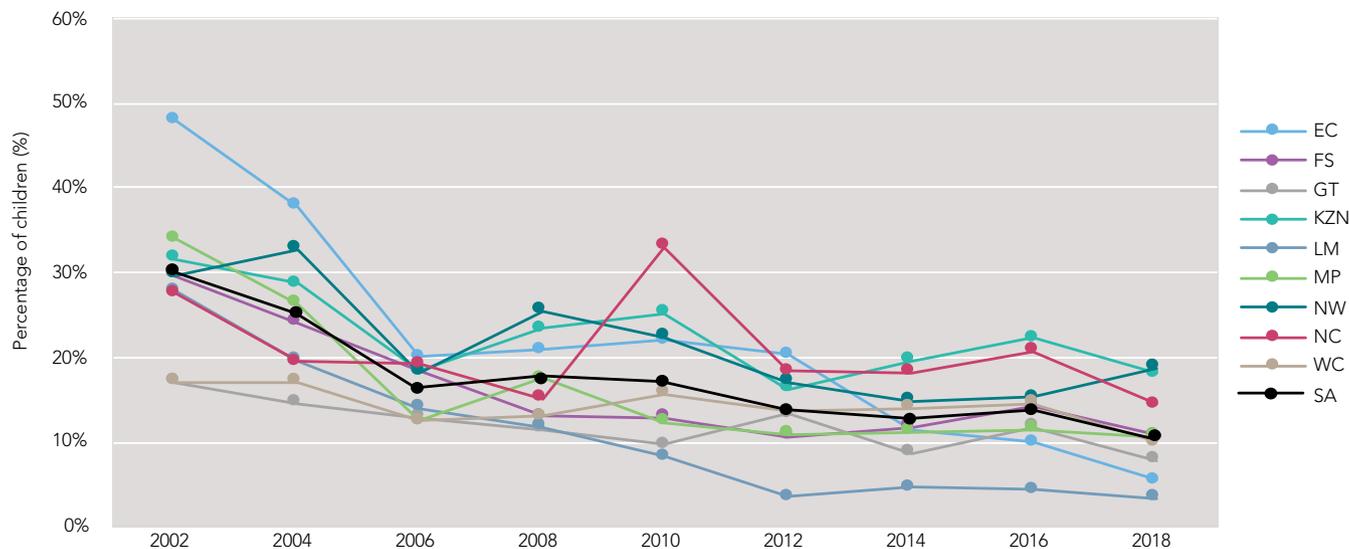
The food system does not exist in isolation. Other critical systems that affect children's nutritional status are the health, WASH (water, sanitation and hygiene) and social protection systems.⁴ Some of these systems (see Figure 2) are discussed in more detail in later chapters. Therefore, this chapter only provides a brief overview of the interaction between these systems and the food system.

The healthcare system plays a central role in modifying the impact of the food system on child health. Infections such as diarrhoea impair children's ability to utilise nutrients, increasing their risk of malnutrition, while malnutrition impairs children's immunity and increases their risk of

infection. At the same time, the increase in overweight and obesity is fuelling an epidemic of NCDs that is placing increased strain on the healthcare system, with malnutrition and diet-related diseases the world's largest drivers of morbidity and mortality.¹⁰ Healthcare services provide essential preventive, promotive, curative and rehabilitative care, from preconception to adolescence and play a vital role in preventing and treating malnutrition. Yet service gaps, overcrowded and inadequately resourced health facilities and conflicts, disasters or pandemics that deflect children and caregivers away from health-care services may impact negatively on children's nutritional status.

Poor water, sanitation and hygiene (WASH) may contribute towards persistently poor child health and malnutrition

Figure 8: Child hunger by province, 2002 – 2018



Source: Statistics South Africa (2019) General Household Survey 2018. Pretoria: Stats SA. Analysis by Winnie Sambu.

such as stunting (see Case 5). This interaction is often mediated through the oral-faecal cycle, where pathogens are transmitted via fluids, fields/floors, flies and fingers to foods,¹⁷ and then to the child, causing infection leading to growth faltering. In addition, challenges in accessing adequate refrigeration and storage mould people’s dietary choices and food preparation practices, often leading to a preference for processed or fast foods to save time and energy (see Case 2).^{18, 19}

Social protection programmes such as social grants, health insurance, unemployment benefits and public works programmes²⁰ can reduce food insecurity by providing access to cash and/or food relief.²¹ However, their impact on nutrition is dependent on: i) the households’ access to well-functioning local food markets, ii) the relative value of the benefit (cash or food), and iii) the duration and reliability of the benefit.²¹

What do we know about the food system in South Africa?

The South African food system is characterised by cultural and socio-economic diversity, high levels of income inequality, a young (but ageing) population and continued urbanisation. The food landscape confronting children and their caregivers consists of a highly commercialised food system, with the majority of households purchasing all their food. Subsistence production is limited and shrinking. Based on the General Household Survey from 2017, only 15% of households are involved in agricultural activities.²² More than half of these

households are female-headed households in rural areas and 78% of them engage in agricultural activities as an extra source of food. However, only 2% of those engaged in household agricultural activities manage to generate an income from their activities. The two provinces where agricultural activities are highest (Limpopo and Eastern Cape) reported the lowest levels of child hunger (see Figure 8).

On a national level, South Africa has a relatively well-endowed agriculture sector, albeit based on limited arable land and significant water constraints. It is often argued by the mainstream agricultural sector and many agriculture economists that the country is food secure, as it is generally a net exporter of agricultural and food products, with agricultural production levels having grown steadily to meet the growing demand for human consumption, animal feed and alternative industries such as biofuel.^{23, 24} Yet gross inequalities and poverty renders almost two-thirds of children in South Africa at risk of food insecurity and hunger.²²

The COVID-19 pandemic has foregrounded the failures of the food system to provide sufficient, healthy, nutritious food and to serve the most vulnerable people in South Africa, including children of all ages. Progress achieved since 2002 in the reduction of hunger (See Figure 8) may well be reversed, with indications from the NIDS-CRAM data of adverse effects on employment, food security and widening inequality: 40% of the NIDS-CRAM sample reported a loss of employment as a result of COVID-19 and 22% of adults and 15% of children were reported to have gone to bed hungry during the period March to June 2020.^{25, 26}

The growth in conventional agriculture since the 1960s (currently estimated at 2%)²³ has also come at a high environmental cost, with the unsustainable expansion of cultivation into fragile ecological systems.^{1, 27} Current food systems over-produce products of low nutritional value and food products that are harmful to health such as sugary drinks, while significantly under-producing beneficial foods such as seeds and nuts, fruits and vegetables.¹ The chain of food production, processing and marketing is increasingly concentrated in a small number of transnational corporations, primarily driven by profit, with ultra-processed food becoming increasingly available and affordable. This imbalance, together with the demand for exports in pursuit of financial gain, often results in fresh fruit being unaffordable and unavailable to the children of the producing country. The 14% inflation in fruit prices in South Africa during 2019/20 is a case in point.^{28, 29} Furthermore, the consumption of fresh vegetables in South Africa has declined whilst consumption of ultra-processed foods increased dramatically between 1994 and 2012,³⁰ with far-reaching public health consequences for children and adults alike.

The rapid spread of formal supermarkets and fast-food chains influences consumer behaviour and food consumption

patterns. This expansion, while offering consumers a wider range of products, also entails major organisational changes in the whole food supply chain. The procurement processes of supermarkets and large processors set the rules of the game for farmers and first-stage processors in terms of volumes, quality and pricing. Corporations have immense power in structuring consumer perceptions of food quality and health, from input into apparently neutral dietary-based guidelines to advertising, while the poorest marginalised consumers are excluded from this process.³¹ Formal retail expansion had been accompanied by growth of the informal food retail economy, which has helped extend the reach of ultra-processed foods into informal settlements and former homelands, which trap many of South Africa's poor.

These power dynamics permeate the food system at different levels and scales. An example is that of women's³² role in nutrition, illustrated by the fact that women's income is more likely to be channelled towards food procurement than that of men. Women tend to spend social grants on food, whereas men tend to spend their income on non-household-related purchases.³³ Gender roles in caring for children are important in this regard. Indeed, women's role in improving nutrition outcomes, coupled with the unequal power

Case 3: Sugar cane production in South Africa

In 2018, South Africans consumed almost 40kg of sugar per person, equivalent to more than 100g of sugar per day. Sugar cane production has grown exponentially over the past 20 years, yet the sector has been undermined by exports from an even bigger and faster growing industry in Brazil, which started flooding the local market about seven years ago, aided by World Trade Organization agreements. Ironically, the effect of Brazilian sugar on the South African industry was no different to how South African exports dominated and undercut sugar cane production in six other southern African countries. The cumulative effect of changes in European markets, adverse climate conditions and increasing local labour costs contributed to the subsequent financial challenges facing the South African sugar industry.⁴² This then fuelled their aggressive opposition⁴³ to the implementation of the South African health promotion levy (HPL) or 'sugar tax'. The HPL translated into about a 10% increase in the retail price of sugar-sweetened beverages in South Africa, as of 1 April 2018. Although the claim that the tax would lead to job losses in the beverage industry proved to be unfounded in Philadelphia, USA,⁴⁴ the per capita volume

of taxed beverages purchased in South Africa declined, whilst per capita volumes of untaxed beverages purchased remained constant, with the reduction being greater in low socio-economic households.⁴⁵ A community-based study in a low socio-economic neighbourhood demonstrated that the reduction in energy (kJ) and sugar consumption from sugary beverages was a result of both behaviour change and the responsive reformulation by industry.⁴³ Although select primary brands retained a high sugar content, many other brands now contain < 4g sugar/100ml (the cut-point for taxation). This is good news as it reduces the sugar and energy intake from sweetened beverages, but it raises new concerns, especially for children, as the safety of non-sugar sweeteners for children has always been questioned.⁴⁶ In South Africa, Regulation R733 requires the clear labelling of all packaged food products containing non-nutritive sweeteners.⁴⁷ The replacement of sugar with one or more non-sugar sweeteners (ongoing own research) has anecdotally also resulted in an even more intense sweetness, which may drive a growing desire for sweet food choices.^{48, 49}

dynamics involved in decision-making regarding how food is used and for whose benefit, once it is accessed, calls for a gendered lens to inform both policy and programming.³⁴ In summary, the availability and affordability of highly processed foods are considered important drivers of poor nutrition.³⁵⁻³⁸ Household income and food expenditure, including intra-household expenditure, do not correlate with a healthy diet. For the most vulnerable groups, nutrient-rich foods such as animal-source foods, fruits and vegetables are not affordable, with both price levels and volatility affecting household purchasing power, welfare, food security and nutrition.³⁹

At another scale, international forces also shape the South African food system. Supply chain policies that focus on economic growth rarely consider the need to increase access to affordable healthy food. A broad example is that of the Department of Trade and Industry aiming to create a favourable environment to attract investment from multinational companies. Yet, economic policies focused on liberalization, particularly for corporate and multinational food processors, have negatively affected nutrition and food security and simultaneously increased the availability of highly processed foods, contributing to diet-related NCDs.⁴⁰

Multilateral institutions such as the World Trade Organisation (WTO) also shape food systems within countries. Often, smaller developing countries with more vulnerable economies are disadvantaged. Sugar production in South Africa is a case in point.⁴¹ A brief summary is presented in Case 3.

What are the opportunities for improving the quality of food for children?

There are a number of challenges that need to be addressed in the South African food system:

- Food value chains are dominated by strong economic and political interests, where food is regarded as a commodity with the primary purpose of delivering profits rather than meeting the nutritional needs of children.^{37, 50}
- The emphasis on innovation and the almost unlimited possibility for technological development in food science in the race to achieve zero hunger, has resulted in a food supply that is far removed from its natural origins. This has become a major driver in the growing obesity epidemic, whilst the tide of hunger and undernutrition, especially in children, continues unabated.
- Nutrition is used as a persuasive marketing tool, where single foods and single nutrients are used out of context⁵¹ to promote brand-specific sales.¹⁵

- Discursive narratives frame healthy eating as a behaviour choice, placing the primary responsibility for poor diets on individuals, rather than recognising the responsibility of all stakeholders in the food chain for delivering sufficient nutritious food, produced with sensitivity to the environment, for all human beings.
- The nutrition of children is shaped by a complex system and requires a whole of government and a whole of society approach, yet a lack of political will and policy coherence continues to undermine progress.

There is global consensus that transformation of food systems is critical and long overdue. The cost of inaction – and allowing undesirable action to continue unchecked⁵⁰ – cannot be ignored. Such transformation should include re-evaluating the type of commodities, the quality of food and the mechanisms through which it should be made accessible and affordable for children to consume healthy, nutritious food every day. In addition, food should be provided in a sustainable way to ensure that the planet can continue to produce adequate quality food while respecting the diversity, livelihoods, and well-being of communities and the fragile lands that nurture much of what we eat.⁵² The fostering and empowerment of the most vulnerable, yet structurally-weakened, stakeholders in the food system is critical. To achieve this, food systems should become child-centred, pro-poor and sustainable. See Table 6, for a diagrammatic illustration of the opportunities and threats to healthy diets for children in the food system.

Towards a child-centred food system

A child-centred food system is one that not only reduces malnutrition but also makes healthy diets available, affordable, appealing and aspirational for children (0 – 17 years).⁵³ Hawkes and colleagues⁵³ advise that such an approach should start with the lived realities of children and their caregivers and then use a child-centred assessment to identify necessary actions throughout the food system. This is critical to avoid the pitfalls of starting the assessment upstream (e.g. agriculture), which carries the risk of identifying actions that would fail to translate into better diets for children because of other moderating factors in the broader food system, in particular within the supply chain and within households. Similarly, it avoids the limitations of remaining at the level of individuals and households, without addressing the upstream elements of food systems. Where possible, double-duty thinking to address both under- and overnutrition should be applied to all interventions, as the causes of undernutrition and overweight are very similar.

Table 6: Threats and opportunities towards a nutrition-sensitive and child-centred food system

	Food supply chains	Food environments	Consumer behaviour
Threats	<ul style="list-style-type: none"> • Overt focus on increasing production of staple foods • High cost of fruit and vegetables • Corporatisation • Gaps, contradictions and incoherence in food and nutrition related policies • Unemployment and poverty 	<ul style="list-style-type: none"> • Obesogenic school food environments • Marketing of unhealthy foods to children • Rising cost of healthy food • Lack of complementary interventions to enhance social protection 	<ul style="list-style-type: none"> • Inadequate capacity and resources to deliver nutrition interventions • Vulnerability of children to inappropriate marketing • Availability and affordability of highly processed food of poor nutritional quality
Opportunities	<ul style="list-style-type: none"> • Produce foods that contribute to nutritious, safe, affordable and sustainable diets • Create livelihoods in the formal and informal food economy • Use public procurement for institutional and school feeding to stimulate local food production • Limit manufacturing of unhealthy food options 	<ul style="list-style-type: none"> • Adopt pro-equity policies • Apply HPL towards healthy food environments for children • Make healthy food cheaper than unhealthy food options • Provide targeted income support and social protection • Prohibit marketing of unhealthy food to children 	<ul style="list-style-type: none"> • Align school feeding and nutrition education in schools with healthy and sustainable eating guidelines • Equip health professionals with relevant social marketing and advocacy skills and integrate social justice and ethics into the education of marketing, agriculture and business graduates • Mandate front of pack labels on unhealthy packaged foods • Establish a mandatory nutrition information system at all food outlets • Cap unhealthy options at food outlets e.g. no up-sizing • Promote healthy eating

When these actions are environmentally sensitive, they become triple-duty actions⁵⁴ – the ultimate objective – good for people and the planet.

Opportunities for intervention

It is clear that solving the double burden of malnutrition in South Africa will not come through a single intervention or in a short time. It requires sustained, multiple, small interventions that are well-aligned and coordinated to meet a common vision. These interventions will have to deliberately incentivise all actors in the food system to prioritise children and should aim to address multiple issues simultaneously. See Chapter 9 for a discussion of double-duty actions designed to address the double burden of malnutrition. The effectiveness of actions will also depend on the political economy⁵⁵ at local, national and global levels (Table 7 provides some examples of such actions).

In essence, these interventions should be informed by a food systems approach that aims to improve nutrition through enabling the engagement of actors at all levels of the system. A systems approach would focus on how these actors connect and reinforce one another to ensure the food system delivers healthy, affordable and sustainable diets to children. Taking such an approach would prioritise the design of new agricultural and food system policies to support healthy diets.

An example is that of improving the affordability of nutrient-rich foods, both economy-wide and for the poorest households. For the poorest households, affordability could be increased by targeted income support, nutritional assistance and agricultural development programmes that encourage diversification and consumption of home-produced foods. At the level of a whole economy, this could be done by achieving lower prices through improved agricultural and trade policies.

Threats to the food supply chain, food environment and consumer behaviour have already been highlighted earlier in this chapter and are reflected in Table 6, together with opportunities to create a more nutrition-sensitive and child-centred food system.

Although there are particular opportunities where “pockets” of food systems dedicated to children exist, such as school nutrition programmes, a child-sensitive food system implies a changed approach to the food system in the country as a whole and requires political and economic interventions to transform food supply chains, food environments and consumer behaviour, as illustrated in Table 6.

Within the food supply chain, the production of food, both agriculturally and commercially should consider the diversity of food supply with conscious decisions framed by a pro-health, pro-nutrition, pro-equity approach. This should not be left to individual producers opting-in, but should rather

Table 7: Examples of child-centred, nutrition sensitive and pro-equity activities

Where	What
Political system	Make healthy foods cheaper than unhealthy foods, particularly fresh foods over ultra-processed foods.
	Develop political will to overcome financing, infrastructure, land tenure and trade policy to support a supply of healthy food in South Africa.
	Increase targeted income support and social protection including food relief that nurtures human health and the environment.
	Use public procurement strategies and investments in the public sector (e.g. the NSNP) to ensure a healthy food environment.
	Regulate food environments in and around education and care facilities such as schools and ECDs.
	Extend the HPL to tax unhealthy food items (i.e. foods high in sugar, salt, saturated fat and trans-fat).
	Ensure safe environments for children. Safe in terms of peace keeping so that physical movement through play can be encouraged, but also safe living conditions including safe water, sanitation and refuse removal services in homes, schools and care facilities as the absence of these often results in unsafe handling of food.
Economic system	Make healthy food choices the easy option by clearly identifying unhealthy foods through front of package labelling (FoPL) and similar information on ready-to-eat and menu options at food outlets.
	Make healthy food (specifically vegetables and fruit) cheaper than unhealthy food (through subsidies or a voucher system).
	Tax unhealthy food items.
	Regulate marketing of unhealthy foods to limit the power of corporations to structure consumer perceptions on food quality and desirability.
	Regulate proliferation of unhealthy food products. Consider a food and nutrition review of proposed new food products.
Food supply chain	Align the agriculture and food production agenda with positive nutritional outcomes for children and adolescents to deliver nutritious, desirable, affordable food from sustainable sources.
	Create tasty foods that are healthy (adhere to criteria for nutrients of concern) and in line with the Food-Based Dietary Guidelines. Limit proliferation of unhealthy food products.
	Revitalise and diversify local food systems to reduce the contribution of transportation to climate change and to create livelihoods in local agriculture, manufacturing and distribution of healthy foods.
	Foreground healthy diets for children as primary objective in actions to promote food security and economic growth.
Food environments	Promote eating patterns that nurture human health and the environment.
	Increase programmes that support and encourage consumption of locally produced healthy food.
	Provide a healthy NSNP that complies with the DBE stipulated 30% of recommended daily nutrition and procure locally produced food when possible.
	Ensure NSNP and ECD programmes serve healthy food and that the food environments at schools and educare facilities do not market or sell unhealthy food options.
	Make healthy foods cheaper than unhealthy options.
	Introduce incentives to ensure health facilities, clinics, schools and ECD programmes uphold pro-health, pro-equity, planet friendly principles.
	Incentivise the sale of healthy prepared foods (e.g. at transport nodes and commuter routes) and provide supportive infrastructure that allows safe production and storage of healthy prepared food.
Consumer behaviour	Link pro-health and pro-nutrition measures to social protection programmes to encourage healthy food choices and more physically active lifestyles in safe environments for children. For example, through the introduction of a voucher system as described below.
	Make healthy food choices the easy option by clearly identifying unhealthy foods through FOPL of packaged foods and similar information on ready-to-eat and menu options at food outlets.
	Include appropriate information on healthy sustainable eating in basic education, health services, social services, etc.

Note: Many of these activities are discussed in more detail in following chapters.

fall within an overarching framework that encourages general compliance. Minimum guidelines for producers may be needed and government procurement for food provisioning through hospitals, prisons, schools, ECD programmes, social development food relief, amongst others, should be aligned with these guidelines. The inclusion of locally produced fresh produce in the Brazilian school feeding programme provides an example of such an approach. The environmental footprint of all food production and packaging should be guided by minimum criteria prioritising health and the environment over profit. In some cases, targeted government strategies to ensure that healthy food will be available at a cheaper price

than unhealthy food options may be required. Subsidisation of vegetables and fruit may be considered.

A pro-equity alternative could be a targeted subsidisation of the most vulnerable through a voucher system linked to social grants. Such a voucher system would facilitate the purchase, preparation and distribution of fresh vegetables and fruit at prices that are fair to the farmer, whilst the retailer or vendor can claim a specified amount linked to the difference in price from a central source. This may incentivise healthy food procurement as it will essentially provide additional financial support on top of the relevant grant.

Strategies that should be considered to shape innovation

Case 4: Taxing sugary beverages is good for children

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Childhood obesity rates are high in South Africa – with 13% of 6 – 14-year-olds being overweight or obese – and significantly higher than the global prevalence of 10%.^{63,64} Children who are overweight and obese are more likely to be obese into adulthood and develop non-communicable diseases at a younger age.³ Childhood obesity has been linked with increased rates of cardiovascular disease, type two diabetes, as well as social and psychological problems, both during childhood and later in life.⁶⁶

According to the World Health Organization, people should not consume more than six teaspoons of sugar a day. Most 330ml fizzy sugary beverages contain nine teaspoons of sugar, while fruit juices have 10. The carbonated sugary drinks have almost no nutritional value, do not satisfy hunger and are particularly harmful to the body in liquid form.^{65,67,68}

In a review of obesity and sugar-sweetened beverages (SSBs), good evidence was found that drinking SSBs incrementally contributed to overweight and obesity in children.⁶⁹ Between 2005 and 2010, South Africa has seen a doubling in the consumption of SSBs.⁶⁹⁻⁷¹

South African modelling has shown that a tax on sugar can save 72,000 lives and R5 billion in health service expenditure.⁷²

How do children benefit?

Losing weight is often difficult for obese people, with most interventions focusing on individual diets and failing to sustain successful weight loss over the long term, so it is best to build healthy eating patterns from a young

age.⁷³ It has also been shown that children's eating preferences are determined by their parents and the availability of nutritious food. Therefore, in line with the South African healthy eating guidelines, promoting good (and affordable) nutrition from childhood is an important prevention intervention to improve immediate and long-term health and quality of life.

Taxing the sugar content of SSBs has a number of potential benefits for children. Firstly, poorer households and children will buy fewer SSBs, increasing the possibility of spending that money on healthier food which is a positive step. Secondly, the structure of the SSB tax in South Africa encourages manufacturers to decrease their sugar content. Thirdly, children are influenced by their parents' drinking habits so if parents consume less this will have a positive influence on children.^{74,75} Finally, the tax raises awareness about the harm that SSBs do in our society.

For example, before the introduction of the tax there was extensive media coverage, and a poll on News 24 found that 47% (11,992) of respondents were in support of a sugar tax. A further 28% (7,012) readers were not in favour of it, while 25% (6,492) did not care. As anticipated, after the introduction of the tax, carbonated beverages prices increased significantly compared to non-taxed beverages. Many manufacturers decreased the sugar content to avoid the tax, thus making the drinks healthier.⁷⁶

The sugar tax alone will not solve the double burden of malnutrition in SA, but it will help decrease the harmful consumption of SSBs by children.

in the production of packaged foods include restrictions on the marketing of unhealthy foods to children, FoPL to identify foods high in nutrients of concern, and a review of proposed products prior to production, with the purpose of limiting the proliferation of unhealthy food options flooding the market. These guidelines should apply equally to imported products. Where reformulation of products is considered to comply with the reduction of nutrients of concern, particular attention should be paid to unintended consequences that may put children at risk, such as marked increase in use of artificial sweeteners following the introduction of the HPL in South Africa.

Within food services, menu guidelines should prioritise nutritious foods and cap the proportion of unhealthy food choices. Urban planning should manage and restrict the density of unhealthy food outlets within neighbourhoods, while simultaneously facilitating healthy food outlets – where possible supporting small-scale livelihood-creating enterprises.

Opportunities for sharing information on healthy eating (both from an individual perspective and a planetary perspective) should be optimised and aligned across all government and non-government structures. As an example, a school setting that is pro-health, pro-nutrition and pro-equity would imply that the information provided as part of life orientation in the school curriculum, the food available as part of school feeding, the items available for sale in and around school, the management of the school and sports grounds, and the sponsorships of school events should all be aligned and support the “pro” principles. How the sports grounds at a school are managed should be as health-promoting as the items for sale from vendors.

Policy and regulations in the South African food system

Individual dietary practices and food choices are directly dependent on the external food environment and other factors such as poverty and inequality. These limit the food choices of people living in poor households and contribute to unhealthy dietary practices, often driving a vicious intergenerational cycle of malnutrition, poverty and ill health.

Government can – and should – shape the food system to benefit the poor and most vulnerable. Several ‘hard’ and ‘soft’ governmental policies⁵⁶ should be part of a strategic plan, based on pro-equity, pro-health, planet-friendly and child-centred principles, to ensure effective action.

Food policies are significant factors that influence food and nutrition security. The South African government has a myriad policies and strategies in place hosted by

different departments and with different objectives, some of which are in line with international policy frameworks.³⁴ Evidence indicates that the potential of these policies and legislative mandates is undermined by inadequate and ineffective implementation as well as incoherent actions and interventions undertaken by stakeholders from different parts of the food system, and across different sectors. Policy initiatives of different accounting structures contain gaps and contradictions, with minimal structure for coordination, co-creation and cooperation.⁵⁷ For example, the Child Support Grant – one of the most comprehensive social protection systems in the developing world – is reported to reduce absolute food insecurity and to have positive impacts on early child growth^{57, 58} However, high rates of stunting persist in households receiving the grant, with evidence indicating its relatively low value has been undermined by rising food prices, high unemployment, lack of coordination with potentially complementary interventions and the ready availability of cheap, non-nutritious foods.^{59, 60}

The situation is aggravated by inadequate capacity and resources (e.g. nutrition professionals and community health workers) that compromise the quality and reach of existing interventions.⁶¹ As a result, South Africa’s policy aspirations remain far from the real lives of many South Africans.

Conclusion

The food system has consistently failed those trapped by the structural underpinnings of inequality, with a confluence of systems undermining their ability to access safe, nutritious and affordable food. Without radical transformation involving government policy reform, widespread grassroots and civic action and accountability throughout society, the food system will continue to be dominated by cheap, unhealthy, ultra-processed food products, and healthy foods will become increasingly unaffordable. Ecological costs are outstripping the ability for nature to heal and regenerate, and future generations will be condemned to passing on intergenerational poor health and inequality.

A coordinated and coherent nutrition-sensitive approach across multiple sectors would help move the food system towards a pro-poor, pro-health, sustainable and child-centred focus and complement existing nutrition and health system strategies to optimise children’s nutrition, health and development, as illustrated in Figure 6. As the food system is directly influenced by health, water and sanitation, environmental, technological, political, economic, social and demographic drivers, it is essential that these sectors are also sensitised about their roles and responsibilities in improving

children's nutrition outcomes by ensuring that healthy foods are available, accessible, sustainable and easy to use.

This can be achieved through the use of incentives and disincentives that encourage actors across food supply chains to protect, promote, and support healthy diets for children. Such initiatives could include support for innovation through tax subsidies funded through the HPL; the creation and

support of livelihoods in the informal food production sector; the diversification of agriculture in line with local guidelines for healthy eating; nutrition-focused financing policies; local procurement; investment in infrastructure such as safe and adequate housing, water, sanitation; and a review of social protection strategies to shield the most vulnerable.

Case 5: Challenges and opportunities for water, sanitation, hygiene (WASH) and infant nutrition in South Africa

Douglas Momborgⁱ

There is a growing recognition of how environmental conditions, including inadequate access to water, sanitation and hygiene (WASH) contribute towards poor child health outcomes.⁷⁷

Each of these components represents a separate field of work, which is dependent on the presence of the others. For example, without toilets, water sources become contaminated; without clean water, basic hygiene practices are not possible; and the provision of handwashing facilities and soap is essential for good hygiene.⁷⁸

Relationship between WASH and nutrition

The UNICEF Conceptual Framework⁷⁹ recognises how child malnutrition is shaped by both dietary intake and disease, and how these immediate causes are shaped by household food security, living conditions and access to health care services. The Lancet series on Maternal and Child Nutrition in 2008 & 2013 highlighted how hand washing, water quality, treatment, sanitation and hygiene could help reduce the incidence of diarrhoea by 30% and therefore reduce the risk of stunting. Drawing on these findings, the Lancet Maternal and Child Nutrition Frameworks have incorporated WASH as an essential element of their multi-sectoral approach to promote young children's development – advocating for access to clean water, sanitation infrastructure, and the promotion of hygiene behaviours across the life-course.⁸⁰⁻⁸³

Although the links between WASH and nutrition seem quite straightforward, the interactions and determinants are not linear. Findings from a recent systematic review demonstrated that the literature covering the links between WASH and nutrition often only considers individual components, either water, sanitation, or hygiene, or a selective configuration of the three components with WASH as a consolidated concept rarely featuring.⁸⁴

These incongruous findings have made planning interventions more difficult. Recent results from randomised controlled trials on the effect of WASH interventions have echoed this and demonstrated only a marginal effect of WASH interventions on linear child growth.⁸⁵⁻⁸⁸ In addition, low-cost WASH interventions often fail to improve health because they require much more user effort, time, and compromise than is required from residents of high-income countries.⁸⁹ On the other hand, other studies have suggested that the smallest deviations from behaviour, such as water treatment, can have disproportionate effects on health-related outcomes.⁹⁰

Access to water and sanitation

The Sustainable Development Goals (SDGs) aim to ensure universal and equitable access to safe water and adequate sanitation and the National Development Plan (NDP)⁹¹ aims to increase the percentage of households with access to a functional water service by 2030, thereby also contributing to SDG 6.⁹²

In 2015, 89% of South African households had access to piped or tap water – 46% of households had access to piped water in their dwellings, a further 27% accessed water on their property, while 14% relied on communal taps, and 3% relied on neighbours' taps.^{92,93} Although household access to water generally improved, 4% of households still had to fetch water from rivers, streams, stagnant water pools, dams, wells and springs.^{92,93}

While the proportion of people with access to an improved water source has increased, the standards for this access have not been maintained at the same rate, and the percentage of households with access to a water service which was "available when needed" declined over the same period – from 64% to 50% in rural areas; and from 94% to 82% in urban settings.⁹⁴ As a result, the share of

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households in urban areas with access to a safely managed water service declined from 90% to 82% between 2006 and 2017, despite this being an SDG indicator.⁹⁴

In terms of sanitation coverage, the percentage of households who reported living more than 200 meters away from the outside yard toilet facility increased from 1% in 2014 to 6% in 2015 and over the same period approximately 270,000 South African households still relied on buckets.⁹² In 2019, 7% of people in informal dwellings still practiced open defecation, predominantly due to a lack of convenient access to hygienic sanitation facilities.⁹⁴ Where open defecation, poor drainage and high population densities occur simultaneously, it increases the risk of gastrointestinal infections, worms and cholera, particularly for children. The most recent South African General Household Survey (2018) pointed out that progress in terms of sanitation provision has stalled, with the final 20% proving to be the most difficult to address.⁹⁵

The past decade has seen significant increases in children's access to water, sanitation, and formal housing, however there has been little or no change in the proportion of children living in informal housing.⁹⁴ While part of the improvements in access to water and sanitation is driven by increased urbanisation, approximately 43% of children still reside in rural areas which are the least provisioned with WASH infrastructure with significant differences remaining within and between provinces.⁹⁴

WASH and Nutrition Policy Environment in South Africa

A range of policies advocate for multi-sectoral approaches to improve children's nutritional status, including the National Food and Nutrition Security Plan for South Africa,⁹⁶ the National Sanitation Policy,⁹⁷ and the National Integrated Early Childhood Development Policy⁹⁸. Yet none of these policies explicitly link WASH and nutritional status in children nor do they provide clear guidance on how WASH should be operationalised in order to address the burden of child malnutrition.⁹⁹

Sustainable access to water and sanitation at scale also depends on good governance, financial resources and technical factors such as infrastructure and improved knowledge. While the primary responsibility for service delivery of water and sanitation lies with the state, a number of stakeholders take part in the implementation including local government and private contractors. Yet party politics, competing priorities between different levels of government, limited managerial capacity, poor

financial resource administration, corruption and weak institutions, all limit government's capacity to deliver sustainable results at scale.¹⁰⁰

Operationalising WASH to address undernutrition

Addressing the challenge of maternal and child malnutrition has proven particularly difficult. Complicating this are infectious disease outbreaks which are occurring more frequently and affecting a growing number of people. The World Health Organization and UNICEF have highlighted how safe water, sanitation and hygienic conditions are essential for protecting human health during infectious disease outbreaks such as COVID-19.¹⁰¹ While the expectation that increased attention to WASH and improved WASH behaviours, such as regular hand washing, will help reduce the incidence of COVID-19 and other infections that may affect nutritional status, access to WASH infrastructure has not improved at the same rate as the health and hygiene messaging. It is therefore imperative to note that it is impossible to ask mothers and children to regularly wash their hands if there is not sufficient access to WASH infrastructure at home or at school. The lack of local and district level data has also made it difficult to draw direct links between the provision of WASH infrastructure and the nutritional status of children.⁹⁹

This is further confounded by several factors. Firstly, the associations and interactions between WASH exposures and growth outcomes are not necessarily linear. Secondly, WASH indicators are not necessarily standardised or sensitive enough to affect the desired complex biological changes intended, such as improving linear growth. Thirdly, children's sensitivity to environmental exposures changes across the life course so the timing of WASH interventions is also critical. Indeed, a recent study conducted in Soweto demonstrated that water, sanitation and hygiene are all risk factors for undernutrition in the first year of life, yet hygiene has greatest impact during the first month of life where it helps reduce the risk of stunting and overweight, access to water has the greatest impact when a child is around 12 months old helping to reduce underweight,¹⁰² while access to safely managed sanitation facilities is critical throughout the first year of life reducing the risk of stunting, wasting and underweight. Improvements to both household and community level sanitation are therefore required in order to improve child nutrition. In addition, it is important to develop age-appropriate indicators in order to better target interventions.¹⁰²

Recommendations

Based on these findings, several recommendations have emerged. This includes:

- The establishment of a database of tools, policies and implementation strategies around best practice at national, provincial and local levels of government.
- A national dashboard of priority indicators to strengthen monitoring and accountability.
- The integration of data at national, provincial, district and ward levels (including indicators for nutritional status and relevant health-related outcomes) to drive effective intersectoral action.

- The use of consistent terminology and indicators, such as those recommended by the SDGs.
- The integration of government and associated actors and stakeholders, including non-governmental and community-based organisations into scientific studies, to ensure better integration between research, policy and programming.

The current context of COVID-19 has placed a spotlight on the importance of WASH and its role in preventing infection and we would be remiss if we did not try and capitalise on the momentum that this has created.

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