Commentary on South Africa’s syndemic of undernutrition, obesity, and climate change

Significance:
The 2019 Lancet Commission on Obesity describes the clustering of three global problems – undernutrition, obesity, and climate change – as the Global Syndemic. The syndemic holds major health and economic consequences for South African individuals, their families and society as a whole. In this Commentary, we discuss how the syndemic presents itself in South Africa, how it arises in the context of the broader food system, and what can be done about it.

What is the problem?
Malnutrition in all forms continues to be the most preventable cause of ill health globally. The 2018 Global Nutrition Report shows that 88% of countries (124 out of 141) had a double burden of malnutrition (i.e. the co-occurrence of two of the three main forms of malnutrition: undernutrition, undernutrition, micronutrient deficiency) and 29% (41 countries) faced a triple burden of malnutrition.9

This compounding burden is concentrated in low- and middle-income countries (LMICs)9 that are experiencing rapid urbanisation and a shift towards consumption of ultra-processed food and beverage products.6 This nutrition transition coincides with an increase in motorised transportation and contributes to the growing prevalence of obesity, as well as increases in greenhouse gas (GHG) emissions fuelling climate change.8 While LMICs produce the fewest GHG emissions, they are disproportionately affected by the negative impact of climate change on food production and the productivity of croplands that further constrains their already low levels of nutrition and food security and consequent high rates of malnutrition.7

In 2019, The Lancet Commission on Obesity described the clustering of three global problems – undernutrition, obesity, and climate change – as the Global Syndemic.8 In contrast to previously siloed perceptions of undernutrition, obesity, and climate change, the Global Syndemic model calls for a systems thinking approach to address the intersection of these challenges. The food system is a main factor which underpins the interaction of undernutrition, obesity, and climate change, and alone contributes to one third of anthropogenic GHG emissions.9 It gathers all the elements and activities that relate to land use for agriculture, production, processing, distribution, and waste management around food (summarised as the food supply chain, food environment, and consumer behaviour).10 While food systems are the backbone of human health, the currently ‘broken’ global food system is costing us not only a healthy environment, but also healthy and productive years of our lives.

The syndemic holds major health and economic consequences for individuals, their families and society. In South Africa, the combined cost of undernutrition (ZAR62 billion per year)11 and obesity (ZAR33 billion per year)11 is 10% of the country’s GDP.12 These challenges are further compounded by a debt burden that sits around 80% of the country’s GDP.13 Resources are clearly limited, hence, addressing the intertwined issues presented by the syndemic requires common strategies.

This Commentary focuses on how the Global Syndemic presents itself in South Africa, and on one of its major common drivers, the food system.

Manifestation of the syndemic
Food and nutrition insecurity are serious challenges and the natural environment in the context of climate change is a significant contributor.14 South Africa is experiencing comparatively more severe impacts than average in terms of temperature and rainfall variability.15 There has also been increasing drought, flooding, and changes in the timing of the rainy season.16 Agriculture contributes around 2.5% to South Africa’s GDP, but it utilises around 6% of the total labour force – a significant labour market in a country with high rates of unemployment.17

The 2020 Economic and Recovery Plan for South Africa provides a summary of the multiple socio-economic challenges that the country faces. These include gender inequality, a high unemployment rate, widespread poverty, declining economic growth and declining investment.18 These challenges are further compounded by a debt burden that sits around 80% of the country’s GDP.19 Resources are clearly limited, hence, addressing the intertwined issues presented by the syndemic requires common strategies.

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**Why is this happening?**

To understand the key drivers of the syndemic and their interaction, we conceptualised a model (Figure 1) using Downs et al.’s food environment typology. Figure 1 summarises the interaction between the elements in the food environment typology and climate change, and provides an opportunity to identify entry points for action. In this section we unpack Figure 1 by discussing how the issue of poor nutrition is driven by diet, how diet is influenced by the food environment, how the food environment subsequently forms part of and is influenced by the food system, and how the food system and climate change have a bidirectional impact on one another.

![Conceptual model of the food environment typology and its elements driving the syndemic.](https://doi.org/10.17159/sajs.2023/14776)

**Figure 1: Conceptual model of the food environment typology and its elements driving the syndemic.**

**Nutritional status is determined by diet**

South African diets are characterised by high fat and sugar intakes, with 40% of children in Grades 8–11 regularly consuming food high in fat (cakes, biscuits) and 50% consuming sugary beverages. One quarter of South Africans’ dietary intake consists of sugar, alcohol or fat. The mean per capita sugar and salt intake exceeds the amount recommended by the World Health Organization, while the reverse is true for fruit and vegetable intake. Furthermore, in 2017, 36% of households were categorised as having a low dietary diversity score with 60% in rural areas and 47% in urban slums.

**Diet is determined by food environment**

How people make decisions about which foods to acquire, prepare and consume is determined by the food environment, which at its core is the physical, socio-cultural, economic, and political context in which individuals engage with the food system. In other words, what people eat is dependent on what food is affordable, accessible, available, and desirable. These elements of the food environment are discussed in the sections below.

**Price**

One key driver of dietary patterns is the price of healthy foods compared to highly processed foods. South Africans have been facing a worsening food environment and compromised purchasing power for healthier diets, which cost almost 70% more than less healthy alternatives. In turn, a lower than recommended consumption of fruits and vegetables is partly explained by their high cost, which has risen more rapidly than that of other foods. The Pietermaritzburg Economic Justice and Dignity Group’s Household Affordability Index study (2021) showed how the cost of a basic nutritional food basket for a lower-income family increased by around 7% from September 2020 to August 2021. This period coincides with a three-year drought in South Africa as well as the COVID-19 pandemic – potential reasons for disruptions to food production and consequent price increase.

**Availability**

Unhealthy dietary patterns of high intake of fat, sugar and salt are also influenced by the proximity to and the number of fast-food outlets. A 2016 study found that in Gauteng, South Africa’s most densely populated province, fast-food outlets (n=1559) vastly outnumbered their healthier counterparts, formal grocery stores (n=709). Furthermore, the distribution of food availability followed a social gradient, where grocery stores were predominantly available in higher socio-economic areas, while fast-food outlets were concentrated in areas with lower to middle-income and predominantly black South African communities. A similar trend was reported for Cape Town.

**Manufactured demand**

Food marketing has been shown to be a major influence on food attitudes, choices and literacy without cognitive effort or awareness. Food marketing also socialises consumers to form emotional connections with food or develop consumption behaviour outside of traditional meals. Evidence suggests that industry practices (including food placement on shelves and in-store location marketing), subconsciously skew consumer choices towards less nutritious food options. This phenomenon has been well documented and shown to form lifelong consumer behaviours, particularly among children who are the most vulnerable to persuasive messaging. Unhealthy food marketing in South Africa has also been observed at alarming rates in settings where children gather, such as schools. This has been observed even where the food and beverage industry actors have made public pledges to desist from such practices.

**The food environment is determined by the food system**

The choices that consumers make about food in their environment is dependent on the food systems that create these environments. Food marketing and consumption are influenced by the food system. The bi-directional relationship between the food system and climate change in Figure 1 relates to two key elements in the food system, the food supply chain and underlying consumer behaviour. A helpful start in explaining how consumer behaviour influences the climate is Bennett’s Law in agricultural economics, which states that “as people become wealthier, they switch from simple starchy plant-dominated diets to a more varied food input that includes a range of vegetables, fruit, dairy products, and especially meat”. The consumer-driven diversification of food supply, a trend well documented in developing countries, requires more resources to produce, with negative consequences on the environment and climate. These consequences include the loss of natural ecosystems due to increased demand for land conversion for agricultural production, and twice as much carbon emissions from meat production than that of vegetables. While consumer behaviour has a clear impact on the environment, the reverse is also true. Climate change influences consumer behaviour as it decreases the potential kilocalorie production and hence the quantity of food available and ultimately consumer choice.
Further, climate change-induced decrease in crop yields across the globe influences food supply chains, forcing nations to retain food production and production capabilities for regional purposes. While South Africa is a net exporter of agricultural products, it is dependent on the imports of foods (such as fertiliser and plant-protection chemicals) required to produce this surplus that is exported. As such, the indirect impact of climate change on the international food supply impacts South Africa.

Food systems are affected by changes in agricultural practices, forced migration due to climate change and destruction of food infrastructure due to climate-related hazards. While the increasing numbers of floods and droughts in South Africa already pose a severe economic threat to the agriculture sector and its ability to provide food, the Intergovernmental Panel on Climate Change (IPCC) estimates that agricultural productivity will further decline from 21% to 9% in sub-Saharan African by 2080 due to climate change. Unless the negative impacts of climate change on food production are anticipated and mitigated, climate change will only serve to worsen food security for South Africans, further increasing under- and overnutrition.

While production in the food supply chain is impacted by climate change, there are also elements in the supply chain which impact the environment. For example, South Africa generates around 10.2 million tonnes of food waste each year, which has both environmental effects due to resulting GHG emissions during decomposition and also increases food insecurity through wastage being factored into food prices.

**What can be done?**

The 2018 Global Nutrition Report Executive Summary emphasises five critical steps to tackle this syndemic. These steps below provide a good starting point to address the syndemics in South Africa and transform the food system so that it promotes environmental sustainability, human health, social equality, and economic prosperity.

**Step 1: Breaking down silos and developing comprehensive programmes**. Efforts should focus on double or triple duty actions that simultaneously address the common drivers of two or more issues of the syndemic. In doing so, researchers, policymakers, and donors all need to strive to identify an evidence base of systemic drivers and actions. Engagement with all stakeholders is critical – including those affected by the challenges (people living with obesity, in an obesogenic food environment), those who intentionally or unintentionally create the unhealthy systems, and those who are trying to change these systems.

**Step 2: Prioritising and investing in the data needed and capacity to use it**. By better understanding and investing in geospatial data, the impact of climate change on the food system and its links to malnutrition and obesity can be better assessed.

**Step 3: Scaling up and diversifying financing for nutrition**. Fiscal policies, such as the sugar-sweetened beverage (SSB) tax, are great examples of triple duty actions. These can both incentivise consumers to make better nutritional choices and generate revenue that can be used to finance the sustainable transformation of the food system. Evidence from New Zealand shows how a junk-food and SSB tax was estimated to not only reduce GHG emissions but also provide potential savings for the health system. Besides broader-scale nutrition financing initiatives like the one in New Zealand, solutions also exist on a smaller scale. For example, the provision of financial incentives and support schemes for small-scale farmers in South Africa could facilitate job creation, increase financial and food security, and could help reduce the effects of international food supply shortages by diversifying the food environment available to South Africans. Furthermore, small-scale farming systems are often more environmentally sustainable as farmers have more of a vested interest in the long-term productivity of the land, and local production helps reduce the climate emissions generated from the food import-export industry.

**Step 4: Focusing on healthy diets to drive better nutrition**. Government measures play a critical role in reducing the consumption of ultra-processed foods, which not only fuels obesity and nutrition-related non-communicable diseases but also contributes to stunting and micronutrient deficiencies by displacing more nutritious whole foods, and reducing climate change and biodiversity damage linked to its globalised supply chains. Evidence-based and tested policy recommendations such as marketing bans of unhealthy food and beverage products to children, and easy to decipher front-of-pack warning labels are needed.

**Step 5: Improving the targets and commitments that are driving actors**. Strong governance of actors in the food system is essential to prevent any further damage to health systems and the food environment. Governments should introduce mandatory evidence-based restrictions rather than allowing industries to self-regulate. There is no evidence that voluntary actions by the food and beverage industry safeguard public health. The introduction of the SSB tax (known as the Health Promotion Levy) in South Africa in 2016 is an example of how the government can drive actors and incentivise nutrition – in this case, the tax decreased the average number of SSBs being consumed per individual. While this is a step in the right direction, increasing the tax to the recommended 20% (as opposed to the current approximately 10%) will be necessary to magnify its effects. Moreover, given that the agriculture sector is a key determinant in both climate change and nutrition, additional work needs to be done by the government to translate their commitments to the IPCC into measurable targets that the agricultural system can commit to.

**Why is action not happening?**

Despite continuous endorsement by international organisations, there has been patchy progress in implementing evidence-based policies in South Africa. This has been explained by what the Lancet Commission on Obesity calls policy inertia – the combined effects of strong industry opposition to policies that attempt to regulate or modify commercial activities, and inadequate political will and government reluctance to take up the battle with industry and enact regulatory and fiscal policies. This is particularly relevant in South Africa, where trade liberalisation and the prioritisation of economic growth promotes a favourable political environment for industry actors. This talk to Step 5 in the proposed strategies above – stronger efforts are required to address the current incentive system for players in the food system.

One example of the latest opposition concerns the South African sugar industry that has attempted to influence government policies through its political practices. The industry has continuously distorted the scientific evidence linking SSBs to obesity, promoted ineffective voluntary actions, and weakened and delayed evidence-based policies including the SSB tax and front-of-pack nutritional labelling. Despite civil society organisations and public opinion polls that suggest support for fiscal policies, such as the SSB tax, these have not translated into adequate public demand for enhanced policy action. There continues to be a lack of fiscal and regulatory policies, including taxes on unhealthy foods, and strengthening the existing tax on sugary drinks which has not been increased in rate and scope since its implementation in 2018.

**Conclusion**

This Commentary only touches the surface of the numerous issues surrounding the syndemic of undernutrition, obesity and climate change in South Africa. However, with increasing malnutrition and worsening climate, costing billions of rands annually, this is an opportune time to review the drivers of these major challenges and search for comprehensive and efficient approaches in tackling complexities of the syndemic. The causes of these issues are not singular in nature as they arise from several issues including pricing, marketing, and the availability of nutritious food. There is a wide range of double and triple duty policy options to simultaneously tackle the syndemic; these include the breaking down of silos of action, improving the collection and utilisation of data, scaling up nutrition financing, focusing on healthy diets in the systems, and improving the governance structure for actors in the food system. Actions will demand a more coherent policy action and breaking down of current incentive structures between industry actors and their governance.
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Competing interests
We have no competing interests to declare.

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