Policy Brief

Leveraging the food environment to improve diet quality in urban informal settlements:

Insights from Viwandani informal food vendors

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Executive summary

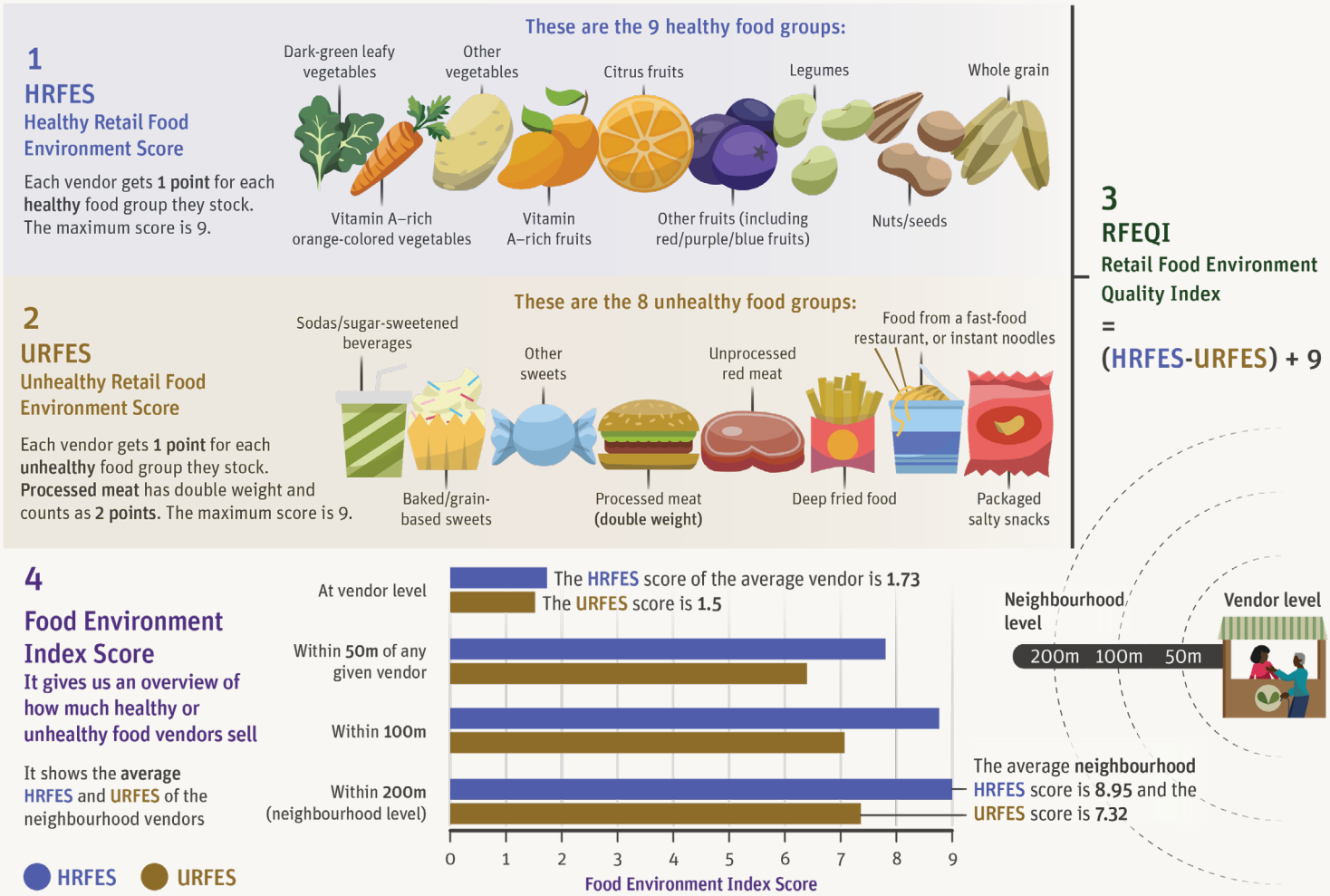
Urban informal settlements in Nairobi face a rapidly changing food environment that undermines diet quality and increases vulnerability to non-communicable diseases (NCDs). Findings from three complementary studies show that households rely heavily on daily food purchases, spend a significant share of their income on food, and consume diets characterized by low diversity and extremely limited intake of vitamin A-rich fruits and vegetables. Although healthy foods are available within a 200m radius (a proxy for walkable access), unhealthy foods are equally widespread—and often more convenient, affordable and appealing. The challenge is not simply a lack of a healthy food supply. It is an environment that systematically makes unhealthy choices easier. Addressing this requires targeted food environment policies, not only supply-side interventions. Income plays a mixed role, as higher income enables households to purchase both healthy and unhealthy foods, suggesting that availability alone is insufficient to shift consumption patterns without targeted policy interventions.

Food safety concerns further exacerbate vulnerability, as fruits, vegetables, and street foods are often contaminated. Unsafe foods compromise both nutrition and health outcomes. Transforming the urban food environment, through vendor-focused interventions, agroecological supply chains development, and strengthened food safety systems, presents a strategic opportunity to improve diet quality, reduce NCD risks, and enhance health outcomes for informal settlement households. This policy brief targets policy makers at both national and county governments; working in various ministries including Agriculture, Education, Health, and Trade among many others. It is also relevant for research and development partners working on urban food systems and NCD prevention in informal settlements.

Key messages

- **The 200-metre food environment paradox:** Within a short 200 m walk, consumers can access almost the full range of both healthy and unhealthy foods. Although neighbourhoods score extremely high for healthy food availability (HRFES = 8.95/9), unhealthy options are nearly as widespread (URFES = 7.32/9) and are often more convenient and heavily promoted. Availability alone is therefore insufficient; thus, policy must also address the density, placement, and promotion of unhealthy foods to enable healthier choices
- **Households depend on daily food purchases and allocate over a third of their total household expenditure to food.** This makes the food environment a direct, daily determinant of nutritional status, and any policy that shapes what vendors sell immediately shapes what families eat.
- **Poor diet quality is common in informal settlements,** characterised by low diversity and low consumption of healthy foods
- **There is low diversity of fruits and vegetables, particularly the vitamin A-rich fruits and vegetables, at the market level.** Only 23% of vendors sell fruits and 39% sell vegetables. The figures for vitamin A-rich varieties are far worse: just 6% and 8% of vendors respectively. Vitamin A-rich foods recorded the lowest dietary intake of any food group in the study.
- **Income enabled purchase of both healthy and unhealthy foods, but higher income was also associated with increased consumption of some unhealthy food groups:** Income growth alone will not shift diets toward healthier patterns. Higher-income households are more likely to purchase both healthy and unhealthy foods, with a preference toward unhealthy options. Economic development must be paired with improvements to the food environment; otherwise, rising incomes may accelerate the nutrition transition in the wrong direction.
- **Support retail formats that promote healthy foods.** Evidence shows that stall/tabletop vendors and cereal shops are key sources of healthy foods in informal settlements, while supermarkets and kiosks tend to concentrate more unhealthy options. Policies should therefore prioritize and incentivize vendor types that supply healthy food groups through supportive licensing, infrastructure provision, and market facilitation to strengthen the availability of fresh and nutritious foods in local food environments.
- **Informal vendors are critical last mile food security providers in informal settlements - and are invisible to policy:** Every fruit and vegetable seller surveyed operates informally and is unregistered. These vendors are the primary last-mile food providers for informal settlement households. Policies that do not recognize, support, and integrate informal traders will fail to reach the communities that need intervention most.

How are the scores in our analysis calculated?



Context and problems

Low and middle-income countries (LMICs) are undergoing rapid dietary and lifestyle transitions, with diets shifting from traditional, wholesome, nutrient-dense foods toward inexpensive, energy-dense and highly processed products.[1,2,3,4] These changing dietary patterns have been associated with changing food environments across both urban and rural areas.[5] Consequently, this has led to a rise in diet-related NCD burden in LMICs.[6,7,8] Non-communicable diseases are an increasing public health concern in LMICs, accounting for nearly 75% of global NCD-related deaths.[9] In Kenya, adult obesity has tripled since 2000, with NCDs responsible for over half of all mortalities. Moreover, more than 50% of hospital admissions are due to NCDs.[10] Urban areas bear the greatest NCDs burden with the informal settlements disproportionately affected due to unhealthy food environments.[11] Addressing this challenge requires transformative food environment policies that not only promote healthier and more sustainable diets but also mitigate the environmental and health impacts of unsafe foods and poor dietary patterns.[12,13]

However, food environment studies have focused mainly on high-income countries[14,15], ignoring the most critical areas of developing countries like Kenya. Most LMICs, particularly in Africa, lack useful food environment data to inform policies. Additionally, most metrics and indices developed are not adapted to local contexts in developing countries. In particular, there are no metrics for assessing food environment with respect to healthy food groups, which protect against NCDs – and unhealthy food groups, which could exacerbate NCD risks. This limits the ability of policymakers to design targeted, evidence-based interventions in informal settlements.

Food safety is also increasingly a challenge in many developing countries, especially among vulnerable residents of informal settlements. Most foods have potentially a high load of chemical or pathogenic microorganism contamination.[2,16,17,18]

These challenges exacerbate health risks on the already overburdened vulnerable informal settlement, hence requiring urgent interventions to improve the quality of the food environment both in terms of healthy food diversity and safety. Initiatives such as the organic food project with funding from the Biovision Foundation Switzerland are therefore important in promoting greater diversity of fruits and vegetables consumption among the vulnerable households in informal settlements while also ensuring food safety of the foods by advocating for agroecological practices which limit the use of harmful chemicals.

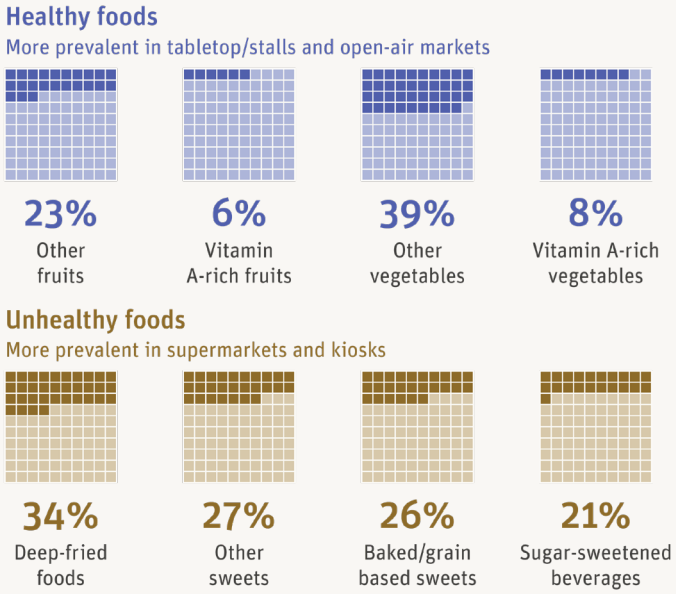
Evidence and Insights

Indices that characterise the food environment with respect to NCDs are useful to inform interventions focused on reducing the NCDs burden. Our finding shows that the informal urban food environment provides both healthy foods that protect against NCDs, and unhealthy foods that exacerbate NCD risks. The results show that out of a possible score of 9, the healthy food score, which we termed the Healthy Retail Food Environment Score (HRFES) at the vendor level, was 1.73. The HRFES improved to a score of 8.95 when the vendor neighbourhood radius of 200m was considered. This shows that within 200m of the retail space, consumers can access diverse healthy food options. On the other hand, out of a possible score of 9, the unhealthy food score, which we termed the Unhealthy Retail Food Environment Score (URFES) at the vendor level, was 1.5. The URFES increased to a score of 7.32 when the vendor neighbourhood radius of 200m was considered. This means that consumers can access over 7 unhealthy food groups within 200m of retail space. This shows why spatial analysis matters: assessing vendor neighbourhood diversity within walkable distances provides a more realistic picture of what consumers are exposed to than single-vendor measures. This ensures a better understanding of what consumers are exposed to in their respective retail food environments.

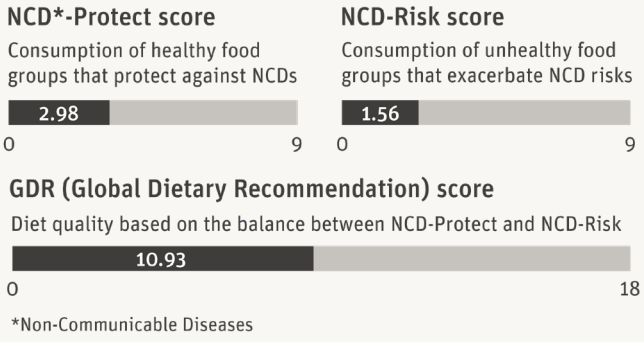
In terms of healthy food availability, particularly fruits and vegetables, only about 23% and 39% of vendors sold fruits and vegetables, respectively. In particular, vitamin A-rich fruits and vegetables (other than dark green leafy vegetables) were very few, with only about 6% and 8% of vendors selling them, respectively. Results from the assessed fruit and vegetable sellers indicate that all their businesses were unregistered, meaning they are all informal traders. This brings out the significance of informal traders as last mile food security providers in informal settlements and further reinforces the need to recognize and integrate them in food systems and value chain operations.

Among unhealthy food groups, deep-fried foods (34%), other sweets (27%), baked/grain-based sweets (26%), and sugar-sweetened beverages (21%) were the most common. Regarding retail types, supermarkets and Kiosks showed a stronger association with URFES food categories, while stalls/tabletop vendors, as well as cereal shops, showed a stronger association with selling healthy food groups. This provides policy options for which vendor types to prioritise when improving the food environment to ensure it is endowed with healthy food options. However, the food safety of the fruits and vegetables are not known. Food safety risks in informal settlements are compounded by weak traceability within food supply chains. Most vendors are unable to identify the sources of the foods they sell or how these foods are produced. Evidence shows that some vegetables sold in informal settlements are contaminated with heavy metals and pesticide residues, posing significant health risks to consumers. In addition, street-food vendors often operate under poor hygiene conditions, increasing the risk of pathogenic contamination. Addressing these risks requires interventions across the value chain, including training farmers on agroecological practices that minimise chemical use, strengthening traceability systems to identify safe sources of produce, and improving hygiene practices among vendors through targeted training, monitoring, and enforcement at the retail level.

The diet quality among the consumers in the informal settlement was also very low, characterised by a low diversity of healthy foods. The table below indicates the results based on three indicators for diet



quality: NCD-Protect, which measures the consumption of healthy food groups that protect against NCDs; NCD-Risk, which measures the consumption of unhealthy food groups that exacerbate NCD risks in a population; and Global Dietary Recommendation Score which measures the overall diet quality based on the balance between NCD-Protect and NCD-Risk. The findings provided insights on the need to promote more consumption of healthy food groups while maintaining the low consumption of unhealthy foods. Strategies that encourage the consumption of healthy foods while discouraging the consumption of unhealthy foods among the informal dwellers are important in improving diet quality. When looking at individual food group consumption, vitamin A-rich fruits and vegetables recorded the lowest intakes. This could lead to numerous health challenges, hence the need to improve their consumption. Regarding unhealthy food groups, consumption of other sweets and deep-fried foods was the highest. Deep-fried foods are particularly associated with a high presence of roadside cooked food vendors.



Looking at the urban informal settlement food environment association with the diet quality, we established that while the number of healthy retail outlet favoured consumption of healthy foods, number of unhealthy retail outlets hindered consumption of healthy food groups. Additionally, our study found that higher spending on healthy food groups was associated with lower consumption of unhealthy foods in most households. Income had a dual effect on the overall diet quality, the consumption of both healthy and unhealthy foods. However, higher income inclined towards the purchase and consumption of unhealthy foods. These findings provide insight that when the number of healthy vendors is increased, consumers are more likely to consume more healthy foods. Policy makers aiming to promote healthy food consumption should promote vendor types who sell healthy food to help encourage their consumption.

Policy options and recommendations

1 **Policymakers must recognize that interventions targeting food supply and demand are incomplete without addressing the retail food environment.**
Retail policies should institutionalize food environment monitoring using metrics that capture both healthy and unhealthy food availability. Because vendor neighbourhoods are where people make everyday food purchasing decisions, spatial food environment indicators such as vendor neighbourhood diversity should be integrated into county and national nutrition and food market dashboards to inform urban planning and support the development of healthier food environments.

2 **Leverage vendor types to improve healthy food diversity.**
With the understanding that retail types such as stall/tabletop vendors and cereal shops promote the availability of healthy foods, while vendor types like supermarkets and kiosks promote the availability of unhealthy foods in informal settlements, policymakers may focus interventions on encouraging vendor types that provide healthy food groups. In addition, regulators could encourage fresh produce stocking through licensing incentives and infrastructure support to vendor types offering healthy food groups.

3 **Strengthen Food Safety Across the Value Chain.**
The continued use of chemicals in most agricultural produce is a public health concern especially considering the rise of NCDs, thus requiring interventions to limit their use. Since most urban consumers are not producers themselves, identifying safe sources of food, especially fruits and vegetables, is critical. This may involve establishing traceability systems to ensure safe sources of produce. Agroecological interventions provide an entry point for safe food production and should therefore be encouraged. Additionally, enforcing hygiene standards, supporting vendor training, and improving safe storage, transport, and handling of fresh foods from farm to market can help enhance food safety in local food markets.

4 **Empower Consumers to Champion Healthy Food Environments.**
The goal is not to blame individual consumers for choices shaped by a system that makes unhealthy foods easier and cheaper. It is to ensure communities understand the links between diet and NCDs and are organised to advocate for the policies and regulations they need. Through the community health promoter network, they should integrate food environment literacy into community health education by covering what a healthy diet looks like, which vendor types to seek out, and how to identify and report unsafe food practices.

Call to action

- **Invest in healthy-vendor incentive schemes** to transform informal food retail environments.
- **Embed food environment indicators into government decision-making systems** to guide policy and resource allocation.
- **Prioritize food safety by implementing traceability and vendor hygiene certification** for fresh produce markets.
- **Scale integrated food environment actions** to improve diet quality and curb the growing burden of non-communicable diseases in urban informal settlements.

This policy brief draws on findings from three complementary studies conducted in Nairobi's urban informal settlements, examining the retail food environment, household diet quality, and the associations between vendor access and consumption patterns. Research was conducted by the Alliance of Bioversity International and CIAT, in partnership with the Diabetes Awareness Trust (DAT) and Feedback to the Future (FttF), with support from Biovision Foundation Switzerland. Full references are available in the accompanying research paper.

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