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NOURISHING SPACES PROJECT

WORKING PAPER

HOUSEHOLD CONSUMPTION PATTERNS AND NCDS IN KISUMU, KENYA

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This is the second in the project's working paper series. For more information about the project and its publications, see https://www.africancentreforcities.net/programme/nourishing-spaces/. We welcome comments and suggestions. Please direct them to the author: hunterjo@gmail.com

The project (Urban Food Systems Governance for NCD Prevention in South Africa, Kenya and Namibia. IDRC Project # 108458) argues that there is a rising burden of non-communicable diseases across Africa that is being driven in part by increasing consumption of unhealthy diets (ultra-processed and fast foods). Unhealthy diets are becoming more available because food systems, especially in urban parts of Africa, are changing rapidly as a result of urbanization and globalization. This project proposes 'urban-scale research' for addressing diet-related non-communicable diseases in six urban sites – two cities each in South Africa, Kenya and Namibia. Ultimately, the project aims to support local governments and community stakeholders in each study site to utilize the knowledge generated from this research to develop local action plans and interventions that will help to reduce the burden of food-related non-communicable diseases.

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Introduction

The Nourishing Spaces project seeks to develop community-led understanding of the nature and drivers of the local food system and its health impacts, and to contribute to city-scale policy interventions. The project focuses on 'urban-scale research' for addressing diet-related non-communicable diseases (NCDs) in six urban sites in South Africa (Cape Town and Kimberley), Kenya (Nairobi and Kisumu), and Namibia (Windhoek and Oshakati). This paper presents the findings of research in Kisumu under Work Package 3, which generated data on the relationship between consumption practices, NCDs, and the local food system. The work is qualitative, focusing on individual household interviews, health profiles and food life histories. This paper examines how consumption patterns have responded to changing food and urban environments, and seeks to explain consumption patterns in the Bandani neighbourhood of Kisumu, demonstrating the linkages between consumption patterns and economic, social and environmental factors. It discusses the nature of Kisumu's food and urban systems and how these shape diet, and presents findings on participants' perceptions of health, NCDs and diets, before identifying potential policy implications.

Background

According to World Health Organisation (WHO) statistics, NCDs kill 41 million people annually, which is equivalent to 71% of all deaths globally. Of this total, 15 million are between the ages of 30 and 69, and over 85% of these 'premature' deaths occur in low- and middle-income countries (LMICs). Four groups of diseases – cardiovascular diseases, cancers, respiratory diseases and diabetes – account for over 80% of all premature NCD deaths. Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD (WHO, 2018).

The burden of NCDs is increasing in LMICs. In Kenya, NCDs represent a significant and increasing burden of ill-health and death. NCDs represent an estimated 50–70% of all hospital admissions and up to half of all inpatient mortality, with the leading causes being cardiovascular diseases and cancer (WHO, 2012). There is a possibility of underestimation due to uncertain or unavailable mortality and morbidity data on NCDs in Kenya.

The Kenyan Ministry of Health has adopted the global vision of halting and reversing the NCD threat. To this end, it launched the 'Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases 2015–2020' to guide the implementation of specific measures to address the burden (Republic of Kenya, 2015). The Kenya Health Strategic and Investment Plan 2013–2017 also outlined a key objective on halting and reversing the rising burden of non-communicable conditions (Republic of Kenya, 2013). The plan set out implementation strategies to address all the NCDs identified in the country. The plan further recognised that some of these NCDs are diet related and that there was a need to provide guidance on prevention and control measures to reduce morbidity and mortality.

The Kenya National Nutrition Action Plan (2018) recognises that government needs to empower communities to claim their rights to good nutrition and guide them to play their role in realising these rights. However, government policy focuses on the national scale and there has been little attention given to the urban or neighbourhood scale. Since the current investments in NCD control are unlikely to bear fruit in the short-term, there is a need to set realistic goals for national programmes and pay attention to regional-, city- and community-level interventions.

Site description and setting

The study was conducted in Kisumu (Fig. 1), the principal city of Western Kenya and the third-largest city in the country by population, with an estimated 500 000 residents, the majority of whom live in informal settlements (County Government of Kisumu, 2018). The study focused on Kogony sub-location, a settlement area at the western outskirts of

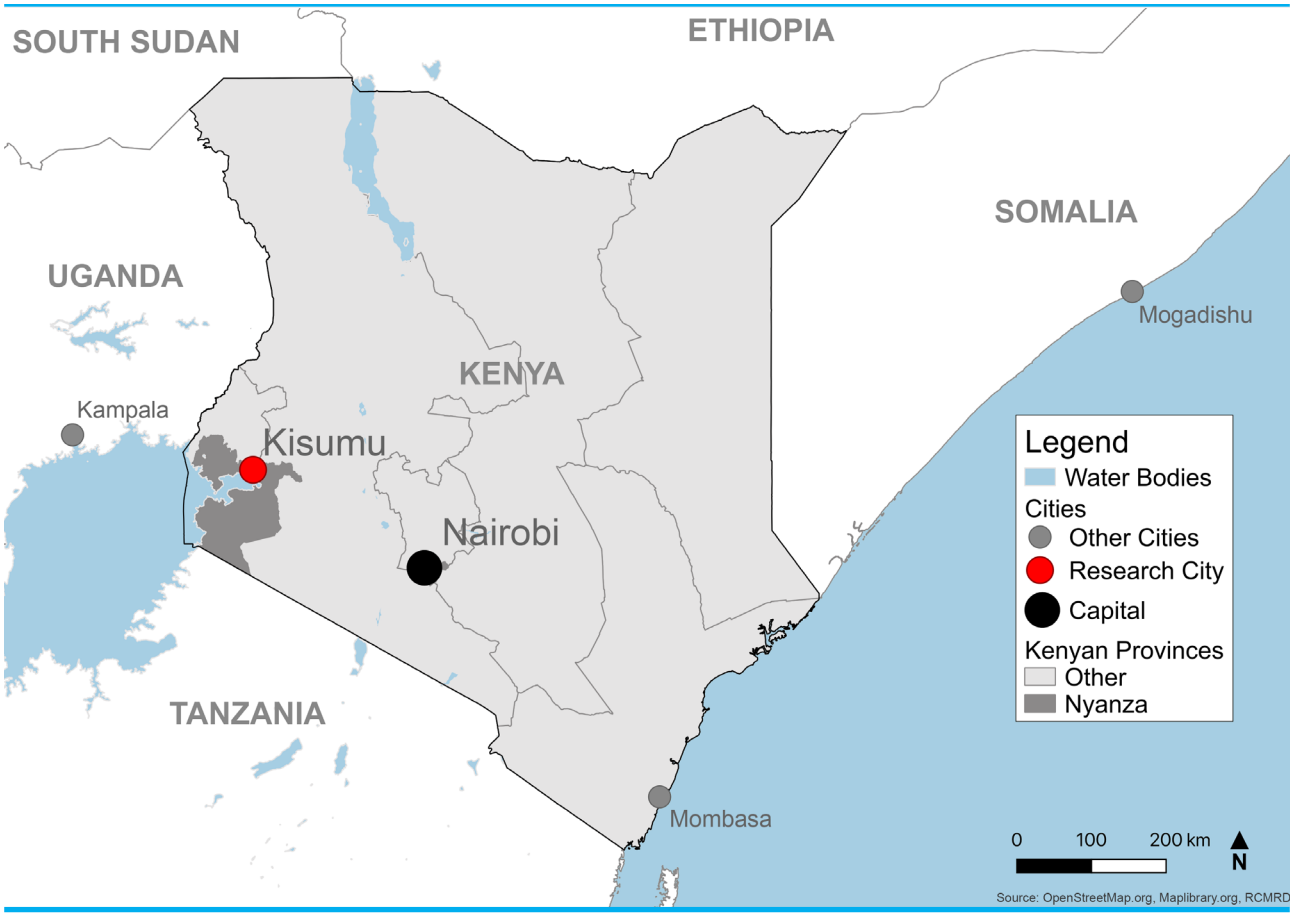

Figure 1: Map of Kenya showing the location of Kisumu

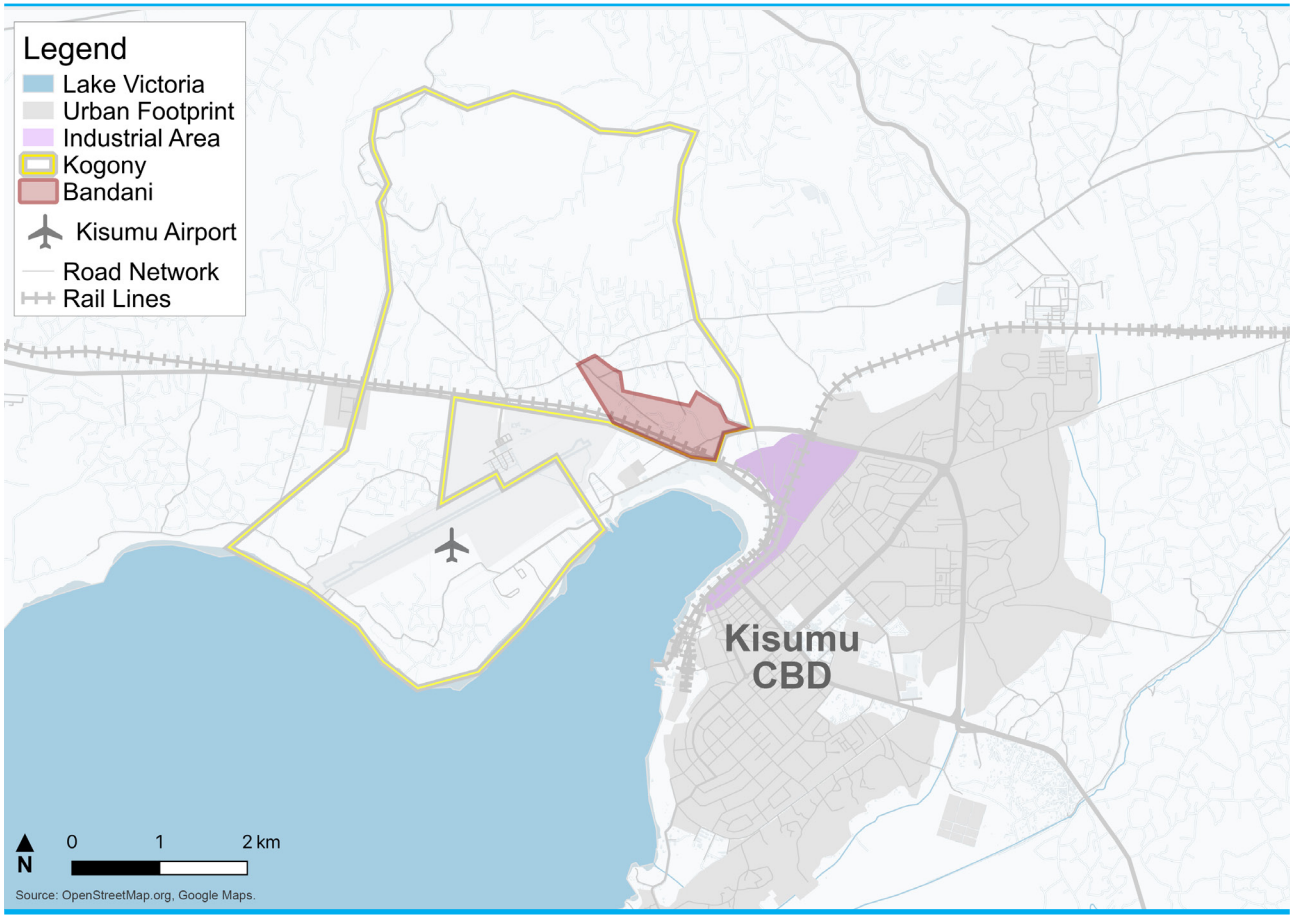

Figure 2: Map of Kogony sub-location showing the location of Bandani

Kisumu City (Fig. 2). The population of Kogony is concentrated in a small informal settlement known as Bandani. The other part of Kogony is a former rural area on the urban fringe that is undergoing rapid transition typical of informal settlements in secondary cities in Africa. The area is characterised by inadequate basic infrastructure, high levels of poverty and high population density. The site was logistically suitable for the study because the population is concentrated in a relatively small area compared to other informal settlements in Kisumu, and easily accessible from the main Kisumu–Busia highway. The residents are of mixed origin, including original inhabitants (the Kogony Clan) and settlers from other parts of Kenya, and have various cultural and religious backgrounds.

The first residents of Bandani informal settlement were evictees from the now uninhabited areas of Kisumu International Airport, Nyanza Golf Club, Kisumu War Cemetery and Kisumu industrial area. Administratively, Kogony, Korando A and Korando B make up the Central Kisumu Ward of the Kisumu West Constituency in Kisumu County.

Bandani is poorly drained and forms a bowl through which storm-water runoff drains from the hills to the lake during the rainy seasons. The drainage issues are compounded by some structures that impede the natural flow. Part of Bandani is swamp, which provides a breeding ground for malarial mosquitoes. Formal provision of water is limited, with the majority of residents purchasing water from communal water points, from shallow wells in the settlement, from water vendors or from boreholes. Around half the population have pit latrines on their plots. There is a primary school that serves both Bandani and adjacent settlements, but a number of residents take their children to more distant schools because of overcrowded classrooms, staff shortages and poor performance. There is one public healthcare facility in the Kogony sub-location, but none within Bandani.

Kisumu's industrial area was the main source of livelihood for Bandani residents before the collapse of major industries. While there is little data available at the neighbourhood scale, the most recent comparative data indicated that Bandani was more densely populated than other informal settlements in Kisumu's slum belt (UN Habitat, 2005). The type of housing in Bandani responds mostly to the needs of the poorer segment of the working class in the industrial area, with a predominance of single-room housing. The inadequacy of physical infrastructure and basic social services in this area was found to be comparatively worse than in other informal settlements (UN Habitat, 2005).

There has been a gradual fragmentation of land in Kogony as usage shifted from agriculture to housing and commerce – a trend that has accelerated since the mid-1990s and affected residents' food security. In the last 20 years farming has come to a virtual halt; only a few families still keep some livestock, mostly for cultural reasons and as a form of investment to be sold when a need arises (Figure 3). Rural–urban migrants who have bought land in the area and are renting houses now outnumber locals, resulting in a faster transition to an urban lifestyle and changes in the culture.

Figure 3: Land advertised for sale in the Kogony area. (Image: Paul Opiyo)

Located at the edge of the industrial zone, Bandani used to provide housing for a significant number of low-paid blue-collar workers. However, with the collapse of major industries, the majority of current residents are informal-sector workers engaged in small-scale retail and services, including informal market traders, street vendors, motorcycle taxi operators, watchmen, domestic workers and casual labourers. Most households live in mud wall and tin roof structures (Figures 4 and 5).

Figure 4: Mud-and-tin row-houses next to the old railway line in Bandani. (Image: Paul Opiyo)

Figure 5: A mud-and-tin house in Bandani with an informal food retail outlet selling fruit, vegetables, eggs, flour, rice and *mandazi*. (Image: Paul Opiyo)

The Kisumu–Butere railway creates a physical barrier between the residential area, the industrial area and the Kisumu–Busia highway. Most houses are poorly built with little ventilation, broken walls and poor drainage, and have no electricity or piped water connections. The desire to maximise rental income has seen landlords put up many small, congested structures with no vehicular access or sanitation facilities. Roads are generally impassable due to poor drainage and inadequate spacing between houses. Kisat Wastewater Treatment Plant releases treated wastewater into the River Kisat, creating a potential health hazard for Bandani residents.

The upper part of Kogony is predominantly inhabited by migrants who have bought land from the initial settlers and live in their own homes – mostly permanent bungalows, maisonettes and a few flats (Figure 6). There are however still some locals living in traditional homesteads, but the population of 'settlers' (both homeowners and tenants) may soon outnumber the locals.

Figure 6: Examples of residential houses being built in Kogony. (Images: Paul Opiyo)

The food environment in Bandani is dominated by small-scale informal traders on the railway reserve and streets, and in two informal markets at transit stops: Riat and Kombedu on the western and eastern fringes of the settlement respectively. These informal traders sell vegetables, fruit, *mandazi,* fish, chips, cereals and a variety of drinks (Figures 7 and 8). A few house shops and kiosks sell general groceries. Most traders source their products from Kisumu's central wholesale market, Kibuye Market, and wholesale shops in the city. Households occasionally purchase food from supermarkets, Kibuye Market and Kisumu's central retail market, Jubilee Market, whenever they travel to the city centre. However, the majority of residents buy their day-to-day food from informal traders on the roadsides within the settlement. Only a few households still produce some crops and keep livestock in the small spaces left within the settlement.

Figure 7: A trader selling silver cyprinid (*mukene/omena*) on the roadside near Riat Market. (Image: Paul Opiyo)

Figure 8: Preparing *bhajias* (deep-fried potato slices) for sale outside a house in Bandani. (Image: Paul Opiyo)

Methodology

Qualitative interviews

Sampling

I conducted a total of 20 interviews, one or two per day, working for two or three days per week. The first 14 interviews were conducted in Bandani, which is more densely populated than Kogony. Purposive sampling was done with the guidance of village elders. The selection criteria included duration of residence in the area, involvement in food provisioning for the household, and indications of whether they are likely to continue residing in the area for the next three years. After 14 interviews in Bandani, saturation point was reached and the decision was made (in consultation with the project's leadership) to conduct the remaining six interviews in the upper part of Kogony. Purposive sampling was done with the help of leaders of a residents' association. Six female respondents were identified among the residents who had bought land and settled in the area, and were involved in sourcing and preparing food for their households (Table 1).

Table 1: Location and description of respondents

Respondent number and location	Description of respondent
1. Bandani	An elderly widow, born in Seme, Kisumu County, who came to Kisumu as a young girl 53 years ago. She lives in her own home, and previously worked as a market trader. She has makeshift structures at the railway reserve for rent.
2. Bandani	A female food vendor who was born in Kakamega and has lived in Bandani as a rent-paying tenant in a tin-roofed, mud-walled single room in a row-house since 2003, with her husband.
3. Bandani	An elderly widow who has lived in the area for 60 years as a tenant. She briefly lived with her children in Kendu Bay before returning to Bandani.
4. Bandani	A young female casual labourer who was born in Busia. She is separated from her husband and has been a tenant in a tin-roofed and mud-walled house-row in Bandani for ten years.
5. Bandani	A middle-aged housewife, born in Yimbo, Siaya County, who came to Kisumu in 1982. She lives in her own tin-roofed and mud-walled home with her husband and school-going children.
6. Bandani	A female shopkeeper who lives with her retired husband and grandchildren. She previously lived in Mombasa and has lived in Bandani for two years.
7. Bandani	A widowed small-scale trader, born in Kogony in 1953. She was married in Bandani and has lived in the neighbourhood since birth.
8. Bandani	A middle-aged female born in Gem, Siaya County. She lives in her own home (tin-roofed and mud-walled), is widowed, and sells alcohol and charcoal for a living.
9. Bandani	A retired carpenter, born in Gem, Siaya County in 1938. He lives with his second wife and children in his own home, which has several rental units attached to it. He sometimes lives in Gem with his first wife.
10. Bandani	A widow, born in Ugenya, Siaya County. She previously sold alcohol but currently works as a fish vendor. She has lived in a rented house in Bandani since 2007.
11. Bandani	A female born in Seme, Kisumu County in 1961. She married in Bandani in 1979, and sells *mandazi* and fish.

Respondent number and location	Description of respondent
12. Bandani	A female born in Bandani in 1965. She married and lived all her life in Bandani. She is a widowed mother of five. She lives in a rented house due to property disputes at the polygamous family home. She is a roadside food vendor.
13. Bandani	A female born in Chemelil, Kisumu County in 1942, who has lived in her home in Bandani since 1960. She is widowed. She previously worked as house maid, sold traditional brew, and currently sells fish.
14. Bandani	A female born in Butere, Kakamega County in 1980. She has lived as a tenant in Bandani since 2000. She is married with three children and is a home-based tailor.
15. Kogony	A female high-school teacher, born in Kendu Bay, Homa Bay County. She is married with one child and has been living in her own permanent bungalow in Kogony for the last six years.
16. Kogony	A female public health officer, born in Asembo, Siaya County. She is married and has been living with her husband and children in their own permanent bungalow in Kogony area since 2010.
17. Kogony	A female revenue officer in Kisumu City. She was born in Nairobi and lived in Manyatta before moving to Kogony (Usoma) five years ago. She lives in her own permanent bungalow with her husband and children.
18. Kogony	A female university lecturer, born in Gem, Siaya County. She grew up in both Nairobi and the rural home. She now lives in her own permanent bungalow in Kogony with three teenage children. She moved to this home nine years ago; was married but is currently separated.
19. Kogony	A business woman dealing in clothes, who was born in Nyalenda, Kisumu and grew up in Kisumu. She is married and lives with her husband in their own permanent bungalow in Kogony. She has lived here for eleven years. Her children attend colleges away from home.
20. Kogony	A female born in Bunyore, Vihiga County, who came to Kisumu in 2006 and briefly stayed with an aunt in Nyalenda before getting married in Bandani. She lives with her husband and children in a rented row-house. She is a housewife and occasionally sells foodstuffs in the neighbourhood.

Participant recruitment

I recruited participants for the study from among the residents, taking into account their ethnicity, religion and residential status. Entry points were through different contact persons: government officials (assistant chief and village elders), religious leaders and leaders of women's groups. The multiple entry points ensured that the sample did not include individuals from only one particular network, who may all have had similar experiences. Prior to recruiting the participants, I spent one day walking in the village with a village elder. The elder was instrumental in accessing potential candidates for interviewing and establishing initial contact with them. The respondents included tenants, house owners, and locals in their traditional homesteads.

An initial assessment of each prospective candidate was done to determine their suitability for the interview. Candidates were screened according to their longevity of residency. Those enlisted had lived in the area for a minimum of three years, and were likely to continue staying in the same neighbourhood (e.g. those with businesses in the area, or whose children go to school in the neighbourhood). The participants were asked to volunteer to take part in the study, without any initial indication of compensation. Participants were given KES500 (≈USD4.50) after the interview as a sign of appreciation, but this was not announced as compensation for taking part in the study.

Ethnographic immersion

Analysis of the qualitative interviews was supplemented with ethnographic research, which involved an in-depth exploration of people's lived experiences. Four cases were selected for ethnographic study: a local eatery in Bandani (food kiosk); Kanyamedha Primary School; a group of women doing outside catering; and a household. I spent time with these cases over a period of six months, observing and engaging with the participants.

Ethnographic research involved an in-depth exploration of people's lived experiences in each of the physical spaces. The aim was to gain knowledge arising from their everyday experiences. However, while grounded within the everyday lived experience of a particular space, our research interest focused on observing how the everyday experience of buying food is shaped by the physical availability, affordability and acceptability of various foods.

The local eatery (food kiosk) was mostly busy during the day as most clients were noted to be informal-sector workers and traders in the neighbourhood who take time off work to eat a quick lunch. The choice of meals was mainly guided by affordability. In the evenings, the food kiosks were mainly patronised by young men coming from work and who needed to eat before going home. At the primary school it was observed that most pupils went home for lunch. However, some carried lunch boxes mainly containing processed snacks: crisps, *mandazi*, bread and sweetened drinks. Food vendors also sold sweets, chips, *bhajias*, ice cream and crisps outside the school gate. The women's group provided catering for events: weddings, funerals and parties. The choice of food was varied but mainly dependent on what clients could afford. The household ate a wide variety of meals, mainly because they operated a food kiosk and would eat what was left over. Whenever they did not have food from the kiosk, their choice of meal was mainly dependent on the time it took to cook and energy availability.

Language

Three main languages – Kiswahili (the national language), English (the official language) and Dholuo (the dialect of the majority of local residents) – are widely spoken in Kisumu. I am well-versed in all three languages and was able to conduct the interviews in the participants' language of choice and, in some cases, a mixture of the languages. The interviews were professionally translated and transcribed. They were then checked for both quality of translation and quality of transcription.

Data analysis

Codebook and coding software

A thematic analysis was conducted by creating a codebook in ATLAS.ti based on themes that emerged from the literature and during interviews. The research questions and sub-questions provided a loose starting point for coding. Each code was annotated with a description of the code to enable a different researcher to use the codebook and identify similar themes. All in-depth interview transcripts were coded using ATLAS.ti.

Ethics

This study was approved by the National Commission for Science, Technology and Inovation (NACOSTI) in Kenya. Written informed consent included an outline of the purpose of the research, risks and benefits, and the opportunity to opt out before or during the interview. Participants had several opportunities to opt out. Transcripts were blinded and both audio and written transcripts were kept securely in password-protected electronic format.

Key findings

This section discusses the key findings from the interviews and ethnographic immersion in three broad sections: Articulation of food consumption choices; Experience of food systems on influencing food choices; and Experience of urban systems on influencing food choices. It then addresses perceptions of hunger, and abundance and scarcity of health.

Articulation of food consumption choices

This section discusses the articulation of determinants of food consumption choices from the perspective of the respondents, who were mostly women involved in making decisions about food sourcing and preparation in households. Food consumption is influenced by many factors, including economic, social, psychological, biological and cultural factors.

Historical food choices

Interview participants noted that their diets had changed substantially during their lives. They indicated that their food choices were previously (and currently) mainly determined by what was readily available in the environment. Elderly residents who grew up in rural areas indicated that they had plenty of food from the farms. The choice of food was mainly limited to what was available from the farm. They usually ate traditional foods when they were growing up, including porridge made from millet or sorghum, sweet potatoes, *ugali, dagaa (omena)*, other fish, meat, *githeri* (a mixture of boiled maize and beans) and cassava. The respondents perceived the food they consumed as healthy.

> *When I was growing up, I grew when we had plenty of food in our homestead, and we grew so healthy.* (R9, Bandani)

Diets were determined by what was readily available in the environment.

> *We would eat anything my mother would get for food.* (R4, Bandani)

> *My grandmother even used to cook for us cows blood with potatoes, it was very good.* (R4, Bandani)

While *githeri* was popular among many respondents, a few occasionally ate bread for breakfast. Tea and porridge were popular drinks. They drank either black tea (without milk) or tea with milk, depending on the availability of milk in the home.

The usual food for those living near the lake was fish.

> *The usual foods were vegetables, fresh dagaa – my mother really liked fresh omena (dagaa), we could also eat fresh fish, since my mother was in the business of selling fish from the lake.* (R19, Kogony)

Those who had access to fish alternated different varieties of fish.

> *We mostly ate fish, we could alternate, and either obambo or fuani or occasionally we also ate meat, once in a while and vegetables.* (R19, Kogony)

> *During the day* ugali *was eaten – made from millet or local unsifted maize, and local vegetables were eaten without artificial flavours. Softening soda was used to soften the food (magadi* or charcoal dust*).* (R3, Bandani)

> We ate chicken, dagga, ugali, beef served with ugali, Modern foods were not available … *There was no baking flour, even rice wasn't available.* (R18, Kogony)

The variety of foods available started changing during the childhood years of present-day young adults. Even though traditional foods were still consumed, new foods were introduced and started gaining popularity. The environment changed with urbanisation and mobility, which also contributed to a change in eating habits.

> *A normal meal most of the time would be bread and tea for breakfast because my parents were very mobile, and sometimes we could do Irish potatoes in the morning with tea. And when we visited the rural area we would now do tea and cassavas, or tea and bananas, and sometimes porridge and* githeri. (R16, Kogony)

> *Lunch most of the time would be* ugali *and green vegetables, maybe meat, my father liked meat and so we ate a lot of meat. Occasionally we would do green grams and rice, but for lunch mostly* ugali*, because green grams needs time to prepare.* (R16, Kogony)

> *For supper there was a mixture, there are days we could do meat with* ugali, *or chapati and chicken … some days we could do green grams and rice, and cabbage because they were readily available.* (R16, Kogony)

Consumption is driven by what is easily available.

> *For breakfast the accompaniments vary – bread,* mandazis, *sweet potatoes, yams and bananas. But most of the time, there is bread on the table. Bread is the most easily accessible. I am not a fan of bread, but I have no alternative.* (R19, Kogony)

Takeaways are easily available in supermarkets and some families have formed a habit of passing by the supermarket and carrying food back home. Several respondents observed that eating takeaways from supermarkets has been a significant change in recent years.

Economic determinants: cost, income and availability

Economic access is a key determinant of food choices in Kisumu. This is an outcome of relatively high prices and low income. While high income does not automatically equate to a better-quality diet, the range of foods from which one can choose potentially increases.

A 2016 city-wide survey established that most households purchase food from informal markets and that 67% purchase more than 75% of the total food consumed, indicating reliance on the markets for food. This reliance on food purchases in a city, where unemployment levels are high (31% of household members aged 20 years and older were unemployed), poses nutritional security challenges as households will tend to purchase what is cheaply available in the markets, with little regard to its nutritional value (Opiyo and Agong, 2018). Urban agriculture has often been promoted as a strategy for enhancing food access. However, a 2016 survey in Kisumu indicated that only 15% of households grew any of the foods they consumed (Opiyo, et al., 2018a). In the current study it was established that, even in instances where households grew any of their own food, access to nourishing food is seasonal because agriculture in the peri-urban areas of Kisumu is mainly rain-fed. Some respondents mentioned abundance of fruit and vegetables in some seasons of the year and scarcity in some months.

> *In the dry season in January, vegetables are not available. But during the rainy season in March to April, there are many traders hawking very cheap vegetables at our doorsteps.* (R11, Bandani)

The income sources of the majority of households in Kisumu are mainly informal-sector wages, which are usually low. Even for those who are formally employed, food scarcity and abundance depend on seasonality and vary with the pay cycle.

> *When I was newly married we relied on monthly salary income, and mid months we would not be able to go for animal proteins in particular, we would make do with green grams and beans, we couldn't buy chicken, beef and others.* (R19, Kogony)

The centrality of cash income in accessing nourishing foods was emphasised by the same respondent:

> *When I was newly married, most of the time we stayed hungry, my husband's salary was so little, we more often drank porridge, or went hungry in the event that we had no money.* (R19, Kogony)

Participants acknowledged that traders ensure availability of food, but access is limited by its high cost. Residents get food from the informal traders next to the roads. I also observed many traders selling various foodstuffs on the roadside, and some mobile traders selling fish, *mandazis*, chapatis and boiled beans. Mobile vendors deliver fish and kale to doorsteps almost every day.

> *We just buy everything from here; this small market serves a large population from these informal kiosks.* (R1, Bandani)

Most residents said that food was available in the markets, but that it was more expensive.

Social and environmental determinants

Food consumption is formed and constrained by social and cultural factors that can lead to differences in the habitual consumption and preparation of certain foods. These cultural influences are susceptible to change with migration as individuals often adopt the particular food habits of the local culture. Social norms also impact on the eating behaviour of individuals either directly or indirectly. Even when eating alone, food choice is influenced by social factors out of attitudes and habits that develop through interaction with others. For example, one respondent originally from Western Kenya said:

> *I did not know how to cook Swahili foods but some Swahili neighbours of mine taught me, but I did not eat them on day-to-day basis because they are very fatty foods.* (R6, Bandani)

In Kisumu, although the majority of residents eat at home, an increasing proportion of food is eaten outside the home (e.g. in schools, at work and in restaurants). The venue in which food is eaten can affect food choice, particularly in terms of what foods are on offer. Access to healthy food options is limited in many work and school environments. For example, respondents 16 and 19 (both Kogony) indicated that, owing to the nature of their work, what they eat for lunch mainly depends on where they are. This suggests that the nature of urban life and livelihoods plays an important role in shaping dietary patterns.

Consumption of convenience foods over home-cooked, healthier foods was determined by a number of external factors including weather, time of day and advertisements. These multiple factors interact to shape diets as global and local food companies leverage on environmental factors. For example, Coke is promoted as a solution for thirst on a hot day. Workers and school children are mostly away from home during the day, and a lunch hour is inadequate time to prepare meals at home, therefore fast foods are advertised as 'food on the go' for busy people.

In a traditional home, girls were socialised to cook for the family. Mothers would train their girls to cook.

> *I learnt cooking from my mum, and later got more experience from my aunt on some stuff I did not learn from home.* (R18, Kogony)

Men were socialized not to cook and did not participate in cooking as this was seen as a woman's domain. This may be one of the reasons why single men were observed to prefer eating in food kiosks rather than cooking at home.

Traditionally meals were social times, when the family would sit to eat together as a household. This created greater social cohesion – a sense of being part of a family. In current urban life, respondents indicated that people come home at different times and socialisation around food has decreased. Little time is devoted to cooking and diets are not planned, hence the impulse eating, which encourages unhealthy eating.

> *When I am left alone, maybe on the days when the children have gone to school, I do not cook, I just like drinking tea.* (R5, Bandani)

> *Sometimes when I am alone at home, I just take tea for lunch.* (R16, Kogony)

In some social circles, particularly among the middle class, unhealthy eating habits are normalised to the extent that those who strive to eat healthy foods, or reduce their sugar and/or salt intake, are seen as elitist. One respondent said that she has been branded elitist by her peers since she tried to reduce her sugar intake and eat healthy foods:

> *Many people when advised to eat healthy foods, easily bursts at you with discouraging words 'just because you've money'.* (R18, Kogony)

There is a perception that healthy eating is for the rich and that the poor and middle class do not have a choice or cannot afford healthy foods. However, traditional foods that are perceived as healthy (e.g. brown *ugali,* made from sorghum) are often dismissed by some people as food for the poor.

> *You have money and you are eating brown* ugali*, which is for the poor.* (R18, Kogony)

Food for celebrations was determined by the local culture. However, some modern foods and drinks are perceived as fashionable to have

during celebrations, including chapatis, pilau (spiced rice with meat), and sugared drinks.

> *Sugared drinks were for celebrations – my father bought me soda when I did well in school. It was a one-off thing, and not an everyday drink.* (R16, Kogony)

Interactions with a group of women who offer social function and event catering services revealed the emerging centrality of sugared drinks in any celebration. Coke was included in nearly all their meal plans or as a refreshment.

Food choices are also determined by consumption trends in the environment. For example carbonated drinks and fast foods are often perceived as trendy and attractive.

> *When I started being responsible for my own meals, I had strong feelings of taking fizzy drinks and fast food since these were considered luxurious foods, for an upper class of people.* (R17, Kogony)

Another respondent said:

> *We could not afford sodas* [laughter] *we couldn't as we do these days, these days chips and chicken and also fizzy drinks can be afforded.* (R19, Kogony)

Several respondents said they did not stock soft drinks at home, but usually take sodas with their meals when they are out of the home. Given the increased consumption of foods away from home, this trend is likely to increase.

> *As a young family, we never used to stock sodas at home but we would take soda out with meals.* (R18, Kogony)

Consumption choices are also determined by the size of the family, and whether a person is staying alone or with other family members.

> *I did not eat* githeri *so much when I was staying alone, I started doing* githeri *when I started staying with people.* (R16, Kogony)

> *When I was living alone, I used to eat mostly takeaways. I started cooking most of the time at home when we started staying together with my husband.* (R15, Kogony)

Those with children changed their household consumption patterns 'just because of the children'. For example, one respondent said:

> *I currently take tea for breakfast. But because of the children, maybe once in a while on Sundays they can have sausages in the morning.* (R18, Kogony)

Changing household structures and family size also influence diets. For example, those who live alone often buy ready-to-eat foods, while larger families prefer to cook at home as this is cheaper.

It is common for children to have a different diet from adults in a household, more so in relatively wealthy households. This may be because children are more easily influenced by advertisements and their peers to consume foods that are promoted as trendy and modern. Children are not conscious of the health implications of their diets, possibly because of the slow progression and delayed nature of NCDs. While adults tend to watch their diets, some feel that children still have time to 'enjoy' their preferred foods. This was frequently observed in school lunch boxes. In Kanyamedha Primary School the majority of children go home for lunch. However, the lunch boxes of those who did not go home contained mainly bread and processed juices. Some children were given money for lunch, which they used to buy chips, crisps, ice cream and sweets sold on the roadside near the school. Further away from Bandani, at Arya Primary School in the city centre, it was observed that most children did not go home for lunch. They carried lunch boxes mainly containing bread, processed juices, sausages and crisps. The children also bought snacks sold at the school gate, mainly chips, crisps, ice cream, processed juices, biscuits, smoked sausages and sweets. Most of the snacks children carry to school or buy for lunch are rich in sugar, salt and fat – generally classified as unhealthy. While the diets of adults may not reflect a rapid nutrition transition, it seems that the diets of children and youth are transitioning rapidly, which increases the potential for diet-related NCDs. Therefore, it is important for research and policy makers to focus not just on notional household consumption, but also on intra-household consumption patterns.

Experience of food systems on influencing food choices

The food system as defined by the High Level Panel of Experts (HLPE) on food security and nutrition includes all elements and activities that relate to the production, processing, distribution, preparation and consumption of food, as well as outputs of these activities including socio-economic and environmental outcomes (HLPE, 2014). Kisumu City's food system is characterised by many actors at all stages of the supply chain. The city depends mainly on distant food production sources and small-scale producers in the neighbourhood. The food retail sector is diverse, ranging from formal supermarkets to mobile street vendors. There is a predominance of production and consumption of a limited variety of processed and unprocessed foods, dominated by a few staples – mainly cereals, fresh vegetables, fish and a small percentage of the meat and dairy produce (Opiyo, et al, 2018a; Opiyo, et al 2018b).

The informal sector is the main source of food for the low-income zones of the city, with supermarketisation gradually creeping in and mainly serving middle- and high-income earners. Food is sourced locally, regionally and nationally. A 2016 survey revealed that local production sources of maize meal, sorghum meal, fish, green vegetables and eggs, which are some of the foods widely consumed in the city, are located 75–150 kilometres away from Kisumu (Opiyo and Ogindo, 2019). Compared to other cities in Kenya, food processing industries have not grown in Kisumu. Road transport is the main way in which food reaches the city. Being distant from food source increases transport costs, which drive up food costs, and small-scale traders need to travel frequently to markets for stock. Food consumption patterns vary among the city's social classes. The variety of food consumed by the poor is usually limited, whereas the wealthier have a wider choice. The city's food system also incurs losses occasioned by a lack of or inadequate preservation and storage facilities at market and household levels.

In the current study, most Kogony residents were found to source their daily food supplies from informal roadside traders, kiosks and shops in the neighbourhood, and through mobile vendors delivering fish and vegetables. The traders are known to the residents and frequently offer food on credit. Staple foods were generally limited to *ugali, sukuma-wiki* (kale), *omena* and occasionally *githeri,* together with bread and *mandazi.* There is a growing tendency to snack on chips, crisps and sugared drinks, particularly among children and informal-sector workers working away from home. Some of the respondents mentioned shopping monthly at supermarkets in town for staples like maize flour, wheat flour and rice. A few who worked in the city centre, or passed through the city on their way home from work, occasionally bought milk and bread from supermarkets. Cooked foods are increasingly being sold on the roadsides in the poorer areas of Bandani and are perhaps an indication of households either having insufficient time to cook or avoiding cooking due to the cost of energy and water, and a lack of kitchen facilities. The range of cooked

foods sold on the roadside includes chips, *githeri, bhajias, mandazi,* fried fish and boiled eggs. In the wealthier parts of Kogony there was no evidence of cooked foods being sold on the roadsides.

Experience of urban systems on influencing food choices

Access to urban infrastructure and services determines the foods sold at the markets and influences the dietary patterns of households. These urban system services include mobility, housing, energy, water and sanitation.

Housing, household infrastructure and energy

Access to household kitchens and sources of energy influence people's decisions to cook at home or eat out in kiosks. Older respondents indicated that they mainly ate at home, despite having rudimentary kitchen facilities. They talked about the transition from the open fireplace, common in rural areas, to the use of charcoal and kerosene stoves among the poor in informal settlements. Modern kitchens with gas and electric cookers are available among the middle-income segments of the population. Most young adults said they did not have a kitchen and cooked in the living room using a *jiko* (charcoal stove) or kerosene stove. One middle-aged respondent said:

> *We used open fire in the rural home. In town we previously used charcoal stove, and on rare occasions we would use kerosene stove.* (R5, Bandani)

An elderly woman said:

> *My sister's children live in a single room near here, and those children do not cook anything. They just eat from roadside kiosks.* (R1, Bandani)

Perhaps the lack of or inadequate kitchen facilities discourage young people from cooking at home.

Strong feelings were also raised about the change from traditional pots to modern crockery:

> *My grandmother had a clay pot for cooking meat and fish. I do not have these. I currently use a gas cooker and an electric cooker.* (R18, Kogony)

The high cost of fuel and electricity discourages households from cooking some traditional foods that were perceived to be nourishing. For example, *githeri*, which requires a lot of energy to cook, was observed being sold ready-cooked in poorer areas. This was not observed in the wealthier areas, perhaps because residents can afford to cook *githeri* at home.

The majority of Bandani residents live in congested mud-and-tin row-houses, known locally as *landies*. Some respondents observed that they had harvested food from their farms in Bandani before most of the land was taken up by settlement.

> *We used to grow maize, sorghum and vegetables, but nowadays we do not have land for farming. Most of the land has been sold by the owners.* (R12, Bandani)

Most of the houses do not have kitchens. Those households living in bigger houses often convert a room to use as a kitchen. One participant responded:

> *I just cook from my main house, using a* jiko *or kerosene stove and pots and saucepan.* (R2, Bandani)

Another respondent said:

> *I have two rooms; one is used as the kitchen. The kitchen equipments I use are charcoal* jiko, *saucepans, water buckets, and I have a pot purposely for water storage.* (R4, Bandani)

Water is available in Bandani from the public water company (Kisumu Water and Sanitation Company). However, it was observed during ethnographic immersion that most residents of the lower part of the settlement (the poorer area) do not have water connections in their houses. They buy water from public or private water points, and store the water at home in jerry cans and water pots. Residents of the upper part (Kogony) have water connections in their homes, and many also have large water-storage tanks for collecting rainwater.

Consumption choices are also determined by the availability of household infrastructure for food storage and preservation. Those who are deprived of such infrastructure prefer to buy fresh foods on a daily basis and stock only processed foods.

> *When I was newly married, I did not have a fridge, so we would just buy on a daily basis. So in the evenings when coming from work, I would just bring with me groceries back home.* (R16, Kogony)

She added:

> *When I was newly employed, my financial capability was low, so there are things I could not buy in bulk because I could not store them. But things like sugar and flour I could buy in bulk to take me for close to the end of the month.* (R16, Kogony)

Refrigeration facilities are mostly lacking and unhygienic methods of food preservation are commonplace:

> *I keep meat and fish in a cupboard and I boil so that it does not get spoiled.* (R14, Bandani)

Adequacy or inadequacy of food preservation facilities influences household diets.

Mobility, labour, skills and time

Changing lifestyles and demands of employment impact on people's diets. Urban residents usually leave their homes early in the morning to go to work, or look for work, and get back late in the evening. Street foods thus become a common part of the dietary intake of households in urban informal settlements. They are readily available and relatively cheap and therefore convenient for many people who have limited time to prepare their own meals. The majority of Bandani residents are informal-sector workers who leave home early in the morning to go to work or seek opportunities in the neighbouring industrial area and in the city centre. Little time is allocated for cooking or preparing food, which encourages the consumption of processed or ready-to-eat foods. Having insufficient time to cook a wholesome meal therefore negatively affects the nutritional wellbeing of a family.

Those who grew up in rural areas gave an indication that families working on farms or in market centres near home allocated adequate time to preparing food at home.

> *My grandmother used to buy her food for the day the previous day, so that by the time she is going to the farm in the morning, her fish would be left cooking slowly at home. She spent more time cooking than we currently do. Nowadays we like fast fried foods.* (R16, Kogony)

Another respondent said:

> *I do not know whether people are pretending to be too busy or they are too busy. People do not want to allocate adequate time to cook. Cooking is a process and one needs to plan for it.* (R18, Kogony)

Modern urban life in informal settlements is characterised by a lack of time to cook. Most residents operate informal enterprises or are employed in the informal sector where there is no enforcement of regulations on wages and number of working hours per day. They work more hours to earn a living and therefore demand ready-made or fast foods, which are often unhealthy.

As the work environment changed, so too did consumption patterns. A respondent who had lived her entire childhood in the city and whose father had worked in town said:

> *Most of the time food was prepared at home. But when my father went to work, occasionally he would come home with a packet of chips and chicken.* (R17, Kogony)

Employment away from home and the nature of the work being done influenced respondents' consumption patterns. For example:

> *Currently, I rarely get time to eat lunch. It depends on where I am, because of the nature of my work.* (R18, Kogony)

There were also perceptions that increasing urban poverty implies that more time is spent looking for jobs or working, and less time is allocated for preparing food.

> *One lacks time to thoroughly prepare food, because a lot of time is spent looking for the food.* (R10, Bandani)

Employment and mobility contribute to the variety of foods available to households. Apart from the local markets in Bandani, those who regularly visit other markets for work or trade are able to buy food from them, thereby reducing the cost of transport to and from those markets.

> *We just buy food from the nearby market here in Bandani, or sometimes from other markets. Whenever I go to sell fish I buy other foods from those markets.* (R10, Bandani)

Policy makers and community health professionals often think that knowledge about healthy diets and cooking skills have an influence on food choices. Some respondents indicated that they learnt how to cook from their parents or grandparents, and wanted to cook the same healthy foods that their parents cooked. However, nutrition knowledge and good dietary habits are not strongly correlated. It was observed that knowledge about health does not lead to direct action. For example, while one respondent acknowledged that eating too much meat is not healthy, reducing the amount of meat in her diet was a challenge:

> *I try to reduce meat. I am told they are linked to cancer, diabetes and high blood pressure, but we still eat meat.* (R19, Kogony)

Knowledge and cooking skills were perceived to be lacking among the younger generations. One respondent noted:

> *The teenagers who get married these days do not know how to cook because we mothers haven't trained them the way we were trained by our mothers.* (R18, Kogony)

This can be attributed to lifestyle changes as mothers often work away from home and do not get to spend much time with their teenage children, and children spend most of the time at school. Inadequate cooking skills and insufficient time allocated for cooking has meant that supermarkets have moved in to fill the gap by selling cooked foods. These were observed to be very popular among young middle-class families, while street food and food kiosks were observed to be popular among poorer residents. However, a major concern is the unhygienic conditions in which street foods are prepared and stored (Nzuma and Ochola, 2010). This was observed in Bandani, where food was sold next to open drains and from makeshift structures without water or sanitary facilities.

Hunger, abundance and scarcity

Households may have access to food, but if it does not provide the required nutrients, the household is considered food insecure. However, in poorer households, hunger was perceived as the total lack of food manifested by 'sleeping hungry'. Provided they had something to fill their stomachs, they did not perceive this as hunger, even if the food was nutritionally deficient. A meal of *ugali* and *sukuma-wiki* was considered adequate. A 2016 survey established that Kisumu households predominantly consumed cereal products (74%) and vegetables (79%), and the household diet diversity score (HDDS) was 4.05 on a scale of 1–12, where any score below 6 is a proxy indicator of malnutrition (Opiyo, et al, 2018a).

Older respondents mostly felt that they had had adequate food in their households in their childhood. Since most of them were brought up in rural areas, most of the food came from the farms. Even those who were brought up in Kisumu indicated that there had been farms in the neighbourhood to produce adequate food for their households, and pointed to urban sprawl as one of the reasons for diminishing farm produce.

> *When I was growing up, we had plenty of food in our homestead. During our time there was nothing like little food, it was in abundance … most of these foods we used to get them from farms.* (R7, Bandani)

Some elderly people have witnessed changes in food abundance and scarcity, and relate it to urban sprawl.

> *When I was newly married, we were strong; nevertheless we started feeling weak as days passed by, we had our wealth reduced, and most of our children are grown up, some died and some starting the independent life. We started experiencing difficulty in feeding the family and living on the right foods. The food we had at home started dwindling, and people started selling land to meet needs.* (R8, Bandani)

Urban sprawl has led to a loss of productive land and increasing poverty. The initial residents sold most of the land previously used for farming and, with increasing urban poverty, residents sell more of the remaining land to meet basic needs. There are also indications of the inability of younger generations to support their elderly parents. Poverty and scarcity of food has increased compared to earlier years when residents had land to grow food.

Abundance or scarcity of food depended on where people were brought up and the economic status of their parents. Those whose parents were employed strongly felt that they had adequate food, while those with parents who were unemployed did not have adequate food during their childhood.

> *So I remember being in Nairobi, and my father passed away when I was barely seven years. We then came back to the village, and life wasn't easy, and meals were scarce, because my mother was a housewife, so my childhood was rather rough.* (R18, Kogony)

Returning to a rural area to be with relatives was seen as a coping strategy after the death of a working parent.

Family size also determined scarcity or abundance of food. Big families implied less food per capita. One respondent emphasised how having a large family resulted in children having to scramble for food:

> Interviewer: *While growing up, was there enough food in your house?*
>
> Respondent: *No. We were so many* [laughter], *we scrambled for food in our house, especially considering that we had many boys, and we girls as well had to scramble for food with the boys* [laughter]. (R19, Kogony)

Many households strongly felt that there was inadequate food in their households and that they had to provide for competing needs (e.g. school fees, rent) in addition to providing food for their families.

> *Sometimes we even sleep without eating, and food is particularly scarce in the months of January to March, since that's the time we struggle to pay school fees. We also need to pay rent and we still have to struggle to get food, so life becomes difficult.* (R4, Bandani)

Scarcity and abundance are also related to fishing cycles. This deprives the poor of fish, which is an important source of protein during certain seasons.

> *We do have food but there are times of scarcity, like currently there is shortage of fish. But there are times when there is too much fish, until we give out to others. This shortage of fish at times is due to overfishing, reducing the number of fish, and so fishermen are denied access to the lake for a period to allow fish stock to regenerate.* (R17, Kogony)

Historically, Lake Victoria was very rich in fish. However, the fish stocks are declining due to pollution and overfishing. Ordinarily fishermen would share their catch with others, but this tradition of sharing is declining due to the scarcity of fish.

In order to cope with scarcity, some people either skip or eat incomplete meals. One respondent said:

> *I have observed people. Most residents of Kisumu do not eat lunch because of food prices that has gone high; most people eat street-side foods. You find someone buying one chapati and bean soup, he eats that and time goes.* (R1, Bandani)

Chapati and bean soup is considered an incomplete meal, as the soup is usually highly diluted. Those who buy chapatis from roadside kiosks and cannot afford beans are served diluted soup to soften the chapati and give the illusion of a complete meal.

Health perceptions and understanding health outcomes

This section discusses respondents' health perceptions and their understanding of dietary health outcomes.

General awareness of diet in relation to health status

Urban life was perceived to be generally unhealthy compared to rural life. Elderly respondents perceived the foods they ate when they were growing up in rural areas as healthy because it was naturally grown and simply cooked. They also indicated that they were stronger and more energetic compared to current urban children. According to one respondent:

> *The foods we ate while young were healthy … since all these foods were naturally grown and well cooked. Nowadays, diseases like ulcers have come to people because of the foods we eat and stresses that people undergo in homes.* (R1, Bandani)

Another said:

> *While we were growing up, my siblings and family members were healthy and bright.* (R18, Kogony)

There is a perception that urban life is unhealthy due to the foods people eat and the stress they encounter.

In a study done in Kenya in 2015, awareness of the health dangers of high dietary salt and sugar intake was reported by majority of the respondents (87.7% and 91.3% respectively) (Mwenda, et al., 2018). However, only about half of the respondents regarded the reduction of salt and sugar in a diet and very important, and an approximately equal proportion were implementing strategies to reduce their sugar and salt intake (Mwenda, et al., 2018). In the current study, respondents perceived some foods as unhealthy due to their high sugar, salt and fat content.

> *In the past we never added fat and processed spices* [e.g. stock cubes] *to food. Currently most foods are highly spiced with processed ingredients.* (R17, Kogony)

Though natural spices are not unhealthy, respondents felt that there has been a shift towards unhealthy processed spices. There were also strong indications of a shift towards fatty and salted foods, which were also viewed as unhealthy.

> *In the past food was mostly boiled and a little oil and salt added to it. Sometimes there was no oil. These days we add lots of cooking fat, salt and processed spices.* (R17, Kogony)

Traditional and natural foods were perceived to be healthier than fast foods. However, fast foods are popular because they are inexpensive.

> *Right now there is a lot of processing making the food we eat right now unfit.* (R16, Kogony)

Respondents emphasised a narrative of difficulty in eating healthy foods because of their lack of availability and cost. However, others said that the foods are readily available, but that the costs are prohibitive.

> *It is not easy for people to eat healthy foods. It would take a lot of effort, because of their non-availability and cost.* (R16, Kogony)

Elderly respondents indicated that people become sick more often than they did in the past, and attribute this to changing diets.

> *I have cried that the foods we eat nowadays, though they are good, they are not healthy. People become sick more often, not like in the past when elderly people were the ones who felt sick.* (R1, Bandani)

This respondent emphasised that low income was the reason she eats unhealthy foods:

> *I liked traditional foods. But the current foods are not healthier as before, but I just eat them because income is low.* (R1, Bandani)

There was a perception that traditional foods like *githeri*, sweet potatoes, arrowroot and cassava were more expensive in the city compared to processed foods like *mandazis,* chips and bread.

> *Cost of healthy foods is so high compared to the unhealthy foods like chips.* (R16, Kogony)

Perspectives on hypertension and diabetes

Awareness, experiences and concerns about NCDs – particularly diabetes and hypertension – were indicated in households and among neighbours in both lower and higher income areas. Most residents had either a member of their household who was affected by high blood pressure or diabetes, or they knew someone in the neighbourhood who was suffering with these conditions.

> *My next door neighbour is hypertensive and diabetic; another neighbour is also hypertensive and diabetic.* (R16, Kogony)

> *My husband is diabetic and so he does not take sodas, but once in a while he does.* (R6, Bandani)

> *I am suffering from high blood pressure.* (R7, Bandani)

> *I am suffering from high blood pressure, and my sister is also suffering from high blood pressure.* (R8, Bandani)

> *I once suffered from high blood pressure, but I am on herbal medicine.* (R9, Bandani)

> *We have experienced high blood pressure in our household.* (R12, Bandani)

There was seemingly high awareness of diabetes and hypertension, and linkage of the diseases to dietary patterns, in both the upper and lower income segments. However, there was very little talk about specific dietary actions, perhaps due to the slow nature of the effect of diets on health. This may also explain the difference in diets for children and adults, as adults begin to watch their diets when they have NCDs.

Awareness of meat and sugar consumption and NCDs

There was strong awareness of sugar intake as a cause of NCDs. Despite the high level of awareness, several respondents reported that they still take sugared drinks. Some indicated that they struggle with weight issues but still take sugar.

> Interviewer: *Are there illnesses in your household that you think are related to the food that you eat?*
>
> Respondent: *Yes, there is diabetes, yeah … because of sugar.* (R15, Kogony)
>
> Interviewer: *What are the things you or people you know do to improve their health?*
>
> Respondent: *We try to reduce the sugar level in our foods, like now in my family we eat brown ugali, we also eat brown bread, and cut on salt and fats.* (R15, Kogony)

A few respondents, particularly middle-income earners, were aware of the health effects of meat consumption. However, reducing meat intake was perceived to be a challenge.

> *I try to reduce meat. I am told they are linked to cancer, diabetes and high blood pressure, but we still eat meat.* (R19, Kogony)

Perception of body weight as part of a health problem

In Kenya, particularly among the Luo, men with a large body structure were traditionally associated with prosperity, while large women were seen as more attractive. However, this perception is changing, especially in urban areas, where carrying moderate weight is seen as a sense of health, but too much weight is seen as a health problem. Both men and women are struggling to lose weight in order to look attractive and healthy. There are contradictions in perceptions of children with big bodies; some see them as healthy, while others consider them unhealthy. In some cases, overweight children were thought of as healthy, while others saw them as weak and lazy.

> *When we were growing up, there was plenty of food and children were fat and healthy.* (R10, Bandani)

A respondent attributed one sister's laziness to her body weight, and the strength of her eldest sister to her lean body:

> *My second sister didn't like to work, she was a bit fat … The eldest sister is the one who knew everything. She was lean and would ride a bicycle like a man.* (R1, Bandani)

Several respondents perceived high body weight as a health problem, with one respondent expressing her frustrations in trying to reduce her weight:

> *I have been trying to cut weight, but it is difficult. In the event I have worked the whole day, I would occasionally take soda plus chips, just not to stay hungry. I know I am supposed to be exercising, but I am defeated* [laughter]. *There are some who jog in the morning, but me I cannot make it. I have even been told to go to the gym. The day I will step there, I will be sick* [laughter]. *I can't bend to do the exercises, it is difficult.* (R19, Kogony)

She further expressed her frustration in trying to reduce her weight by reducing her intake of sugared drinks:

> *I used to love sodas and juices, but I later stopped. I was told to stop sugared drinks to help me reduce weight. Even my tea I take with very little sugar, but the weight is not going down.* (R19, Kogony)

Exercise and health

Kisumu residents have varying levels of fitness, with some adopting more sedentary lifestyles and others engaging in work with high levels of physical activity. Bandani's lower-income residents mainly walk to work in the industrial area or the city centre to save on transport expenditure. However, the easy availability of motorcycle taxis (*boda-bodas*) and three-wheeler taxis (*tuk-tuks)* has reduced the proportion of people who walk to work. An increasing number of people take *boda-bodas*, even for short distances that they would ordinarily walk. The majority of respondents in the lower-income area were engaged in labour that required a lot of physical activity, walking to and from work or looking for work. Domestic chores were also mostly manual. Although most respondents were aware of the health benefits of exercising, they admitted to not doing deliberate exercise because of their levels of physical activity, which they thought was adequate.

> Interviewer: *Do you exercise?*
>
> Respondent: *That is one area I am not good, I do not exercise … but I walk a lot. So, I believe the walking is just enough.* (R16, Kogony)

This was further emphasised by another respondent:

> *I am a carpenter. I also ride a bicycle and walk, and I still do the hard jobs. I do serious exercise.* (R9, Bandani)

Some residents reported knowing neighbours who exercised regularly to stay healthy.

> *I know of a friend who deliberately jogs in the mornings.* (R16, Kogony)

It was observed that some residents of the wealthier segment exercised or knew of neighbours who exercised intentionally to stay healthy. However, in the lower-income segment, purposeful exercise was not perceived as necessary due to the nature of their work, which required high physical activity and was perceived to be adequate exercise.

From the above, it is apparent that residents are generally aware of and understand health outcomes of their dietary patterns and lifestyles.

What is perceived to be nourishing?

Nourishing foods are those that provide nutrients necessary for life, growth and good health. Kogony residents' perceptions of which foods are nourishing varies. Some participants mentioned animal proteins – beef, chicken, fish – as nourishing, while others thought that carbohydrates, particularly the local staple *ugali*, was more nourishing. Fruit and vegetables were often thought of as auxiliary foods, and infrequently mentioned as nourishing foods. However, some mentioned fruit and vegetables as nourishing foods and felt that they were easily available.

> *During rainy seasons like now, there are plenty of fresh vegetables, that if people would take time to adequately prepare them, they would be good foods.* (R16, Kogony)

Traditional foods were perceived to be more nourishing. Some respondents eat unhealthy foods because they are cheaper or more easily available.

> *If we can rewind, we can eat fish, fruits, vegetables and fresh* dagaa (omena). *These were so tasty and healthy, but nowadays people like fried foods. I do eat these fried foods just because I have no alternative, they are more easily available.* (R19, Kogony)

Some of the respondents felt they had limited alternatives due to the high cost of healthy foods and the nature of their work, which did not allow them time to prepare food at home. Other foods that were often mentioned as nourishing included milk, bananas and groundnuts, and some respondents, particularly from the lower-income area, perceived processed foods like margarine and jam as nourishing.

Respondents were generally aware of the foods that they would wish to eat to stay healthy. However, healthy foods were thought to be more costly.

> *If I had the money, I would just be eating fish, white meat, no red meat despite it being cheap. I would also eat plenty of fruits and vegetables. I love fruits but they are also costly. The cost of living is unbearable.* (R18, Kogony)

Awareness of healthy foods was also emphasised by another respondent:

> Interviewer: *What would you eat if you're trying to be healthier?*
>
> Respondent: *More vegetables, I don't like meat a lot. And even when I cook meat, I always control what I serve. I would love to do more fish and I eat any fish, I don't choose. And fruits of course, and as I told you I am really trying to control my intake of Coke.* (R16, Kogony)

There is a strong perception that indigenous vegetables are healthier, particularly if they are self-grown.

> *Those vegetables grown outside have been grown using chemicals. And they harm us later.* (R16, Kogony)

Conclusion: Potential linkages to urban policy

This final section discusses potential linkages of the findings to urban policy. Unhealthy diets often emerge from broader contexts, and policy interventions should consider this wide and complicated web of variables. This may make interventions complicated and expensive, but the increasing burden of NCDs justifies these interventions.

Nutrition education is often prescribed as an intervention that could improve healthy eating. However, in the wider Kisumu County, government intervention in nutrition education is limited by low staffing in the Ministry of Health's Human Nutrition and Dietetics Unit. The county government has only eight nutrition and dietetics officers across the 124 government health facilities (County Government of Kisumu, 2018). While not dismissing the contribution of nutrition education, this study points to other factors that contribute to unhealthy diets in addition to nutritional illiteracy. Availability and access to healthy foods are key, particularly for the poor. The study found that healthy foods were generally perceived to be expensive. Even those who were knowledgeable said they could not access healthy foods due to their high cost. Policy should therefore focus on reducing the cost of healthy foods. The county government recognises the huge potential of the blue economy in reducing the cost of fish, which is an important source of protein in Kisumu. However, the fish industry has been hampered by use of traditional technologies, and inadequate cooling and storage facilities, which are possible areas for local government intervention.

Sugared drinks are widely promoted through advertising by multinationals. This has made them attractive and, coupled with their relatively low cost, has made them the drinks of choice at ceremonies. They are currently easily available and affordable. Tax measures could be applied to control their increasing consumption. Soda taxes have been introduced in several countries (including South Africa) as a mechanism to reduce sugared drink consumption. Kenya introduced tax on sugared drinks, but the action was challenged in court by manufacturers and was never perceived by the public as an attempt to reduce consumption for health reasons as it included bottled water. Instead, it was perceived as an effort by the government to raise more revenue to fill a budgetary gap (Okoth, 2019).

Lack of domestic kitchens or inadequate kitchen facilities makes the cost of preparation and preservation of traditional foods unaffordable, particularly in informal settlements where the majority of residents live in single rooms, often without water and electricity. The majority of the residents in informal settlements cook using charcoal and kerosene stoves. The high cost of energy and inadequate domestic infrastructure discourages cooking at home and promotes the consumption of unhealthy processed and fast foods. A potential area of policy focus would be to create an enabling environment for investments in affordable urban housing with adequate kitchen facilities, and provide infrastructure and services such as water and energy. Kenya's government is currently implementing the Big Four Agenda: food security, affordable housing, manufacturing, and affordable health care for all. At the local level, the County Government of Kisumu has also aligned its development agenda to the Big Four Agenda. Although implementation of the programme is behind schedule, investments in food

security, affordable housing, employment creation through manufacturing, and affordable healthcare should impact the nutritional status of Kisumu residents.

The County Government of Kisumu recognises that food production has been dismal despite suitable ecological conditions for the production of maize, beans, rice, sorghum, green grams, sweet potatoes, cassava, kale and groundnuts (County Government of Kisumu, 2018). Agriculture is a function of the county government and improving local production of food crops can contribute to reducing the cost of food in Kisumu. This can be done through subsidies for the local production of healthy foods, which is within the mandate of the county government.

It is apparent that many workers and school-going children eat away from home, and that their food choices are limited to what is offered at places convenient to them. There are concerns about the safety of cooked and fresh foods sold by informal traders on the roadside and from food kiosks. The main issues have been around the level of hygiene under which food is prepared and sold, and the preservation methods used. The city has inadequate capacity to enforce regulations on food safety (Opiyo and Ogindo, 2019). This encourages the consumption of highly processed foods and drinks (as was observed in school children's lunch boxes), which increases the risk of NCDs. The government could invest in market infrastructure and facilitate traders in traditional cooked foods to improve hygiene and safety. There are plans for expansion and new investments in market infrastructure in the city under the Kisumu Urban Project (KUP), which are targeting the main markets: Kibuye, Jubilee and Otonglo. However, a 2016 survey established that the majority of residents (over 75%) purchase food from informal traders outside the designated market places on a day-to-day basis (Opiyo, et al., 2018a). Thus, policy should also focus on supporting these informal traders to comply with hygiene and safety standards. At the same time, government should offer incentives to corporate institutions and schools to provide affordable healthy foods to their workers and pupils respectively. Some private primary schools are already providing healthy lunches and discourage pupils from bringing unhealthy snacks and sugared drinks to school.

The study had strong indications of the perception that fruit and vegetables are healthy foods. However, respondents often viewed these as auxiliary foods and not part of main meals. This, coupled with their relatively high cost, discourages their consumption. Policy should focus on the promotion of fruit and vegetable consumption through nutrition education, and subsidies could be offered to reduce their cost. Agriculture is a function of the county government, and both the county and national governments can subsidise the production of healthy foods.

The county government has identified trade as one of the key engines of the economy due to its immense contribution to job creation (County Government of Kisumu, 2018). Kisumu has a long history of food trading and its location at the major transport intersection of the Great Lakes region makes it an ideal trading hub. A 2016 survey in Kisumu revealed that informal sources of income were more prevalent, and informal-sector workers generally earned less than those in formal employment (Opiyo, et al., 2018a). This, coupled with high levels of unemployment, contributed to the precarious food security situation in the city. Policy should focus on employment creation and increasing incomes in the formal and informal sectors, and supporting informal food retailers to increase access to healthy foods that will meet the nutritional requirements of the population and reduce the consumption of unhealthy foods that increase the risk of NCDs.

Health challenges including HIV/Aids, malaria, upper respiratory tract infections, and waterborne diseases (e.g. typhoid, diarrhoea) remain a major burden in Kisumu County and City. Kisumu is among the top ten counties in Kenya with the highest incidences of HIV (County Government of Kisumu, 2018). HIV/Aids, malaria and waterborne diseases are the largest threats to health in Kisumu, and are responsible for a growing population of orphaned children, an exacerbated poverty situation, and setting back previous socio-economic gains. The county government has invested in a community healthcare system in which Volunteer Community Health Extension Workers (VCHEWs) are linked to health facilities. The network of VCHEWs mostly focus on HIV/Aids, malaria, upper respiratory tract infections and waterborne diseases, and have well-developed prevention, diagnosis, treatment and referral systems. However, NCDs are often ignored in this system. The current study found that, although there is a high level of awareness of the link between diet and NCDs, a sustained campaign for attitude change is needed. Most people have not taken deliberate steps to watch their diets, perhaps due to the slow progression of NCDs. Policy should focus on mainstreaming NCD prevention in the community health care system.

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