

NOURISHING SPACES PROJECT

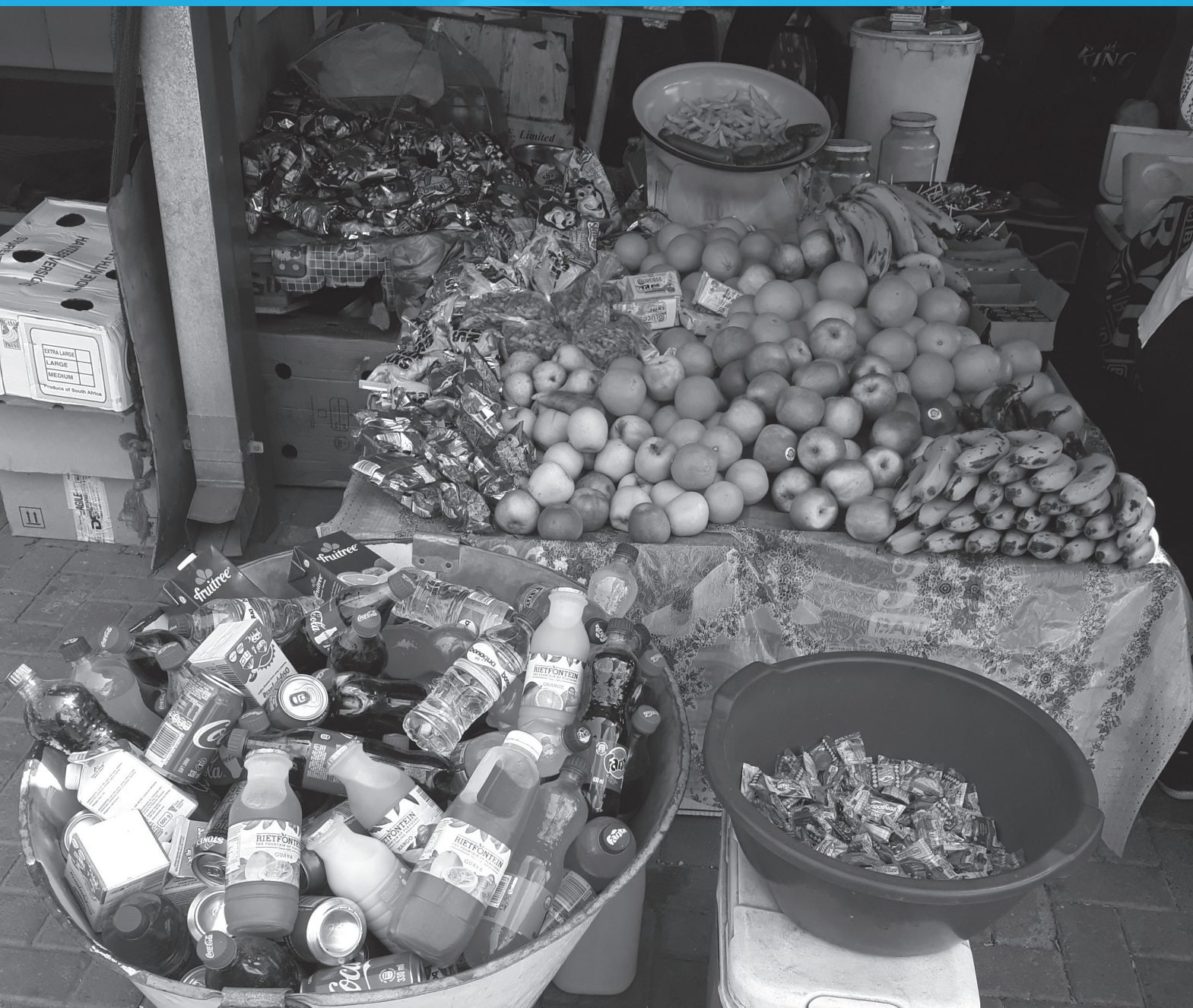
WORKING PAPER

UNDERSTANDING THE LINKAGES
BETWEEN URBAN FOOD SYSTEMS
AND NON-COMMUNICABLE DISEASES
IN NAMIBIA

Working Paper Series #4 | February 2021

BY NDEYAPO NICKANOR,
TOBIAS SHINYEMBA AND
LAWRENCE KAZEMBE

SERIES EDITOR: JANE BATTERSBY



NOURISHING SPACES PROJECT

WORKING PAPER SERIES

Keywords: food systems, non-communicable diseases, food insecurity, food retail

Suggested Citation: Nickanor, N., Shinyemba, T. and Kazembe, L. (2021), *Understanding the Linkages Between Urban Food Systems and Non-Communicable Diseases in Namibia*, Nourishing Spaces Project Working Paper No. 3, African Centre for Cities, University of Cape Town.

© Ndeyapo Nickanor, Tobias Shinyemba and Lawrence Kazembe

Published by the Nourishing Spaces project, African Centre for Cities, Environmental and Geographical Science Building Upper Campus, University of Cape Town, Rondebosch, 7701 South Africa.

Cover photo: Tobias Shinyemba

This is the fourth 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 Ndeyapo Nickanor at nnickanor@unam.na

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.

Table of Contents

Introduction	2		
Background and context	2	Consumption of wild foods	10
The Namibian situation	3	Inter-generational differences in food consumption and food practices	11
		The urban food system and its influence on food choices	11
Methodology	3	Food choices are influenced by food retailers	11
Study areas	3	Energy for cooking	12
Individual interviews	5	Refrigeration	13
Focus group discussions	6	Transport	13
Ethics	6		
		Perceptions of healthy food	14
Results	7	Knowledge of how unhealthy diets are related to NCDs	14
Background characteristics	7		
Traditional food-preparation spaces and practices	8	Conclusion	15
Consumption of traditional foods	9	Endnotes	15
A brief description of the traditional foods consumed by participants	9	References	15
Migration to the city and traditional diets in transition	9		

Introduction

Urban food systems in the Global South are undergoing major transformations (Von Braun, et al., 2008; Demmler, et al., 2017). These changing food systems are intersecting with urban poverty to produce new forms of urban food and nutrition insecurity (Battersby, 2013). Much of the research on urban food and nutrition security and changes in diet has been large-scale survey based. However, in order to understand the connections between non-communicable diseases (NCDs) and food systems, there is a need for qualitative data that examines the dialectic relationship between food systems and local conditions on consumption patterns. This working paper therefore seeks to offer insights into the lived experience of changing food systems and urban systems in relation to diet-related NCDs in two low-income neighbourhoods in Namibia. The paper argues that understanding the lived experience of changing food systems is central to understanding local contexts, a focal point for reducing incidence and improving experiences of diet-related NCDs, and a lever for action.

This analysis represents part of a broader three-year Nourishing Spaces study. Through a participatory research process engaging local government officials and community food system stakeholders, Nourishing Spaces analyses data on diet-related NCDs; conducts research on food systems, consumption and NCDs (and the relationships among them); and examines the governance arrangements underpinning existing dynamics. It seeks ultimately to present two policy and governance approaches to preventing NCDs – firstly to capacitate local government to develop interventions to create generative urban food systems, and secondly to test the viability of neighbourhood-centred Food Systems Committees. The Nourishing Spaces project sites are neighbourhoods in Cape Town and Kimberley (South Africa), Windhoek and Oshakati (Namibia), and Nairobi and Kisumu (Kenya). The choice of primary and secondary cities was motivated by differential rates of nutrition transition and food systems change across Africa, with South Africa being particularly far along in this transition.

This working paper examines the linkages between urban food systems and food consumption in 8ste Laan (Windhoek) and Evululuko (Oshakati) through analysis of interviews with households and focus groups. The interviews focused on a range of issues including food production and storage, preparation, cooking methods, consumption patterns, health patterns and self-reported health status.

Background and context

Sub-Saharan Africa's urban transition is unfolding rapidly, with some projected urban dwellers expected to exceed 50% by 2050 (UN, 2015). Fuelled by increasing population growth, the African urban population is likely to triple by mid-century from less than 400 million in 2015 to about 1.2 billion in 2050 (UN, 2015). Concentration of this urban population is not confined to large cities, but also found in small- and medium-sized cities (less than 500 000 inhabitants). In urban areas, poor urban dwellers live in unplanned, marginalised areas that lack basic services. In Namibia in particular, the legacy of apartheid spatial planning perpetuated the establishment of informal settlements in urban areas where the poor black population live. Faced with unmanaged growth, high poverty and deplorable inequalities, the poor urban are exposed to poor diets and food insecurity, which in turn are associated with increased risk of NCDs (Zaman, et al., 2015). The rise of NCDs in Africa is particularly marked in urban areas and is increasing (Bigna and Noubiap, 2019; Dalal, et al, 2018; Gouda, et al, 2019; Yaya, et al, 2018).

Of the 57 million global deaths in 2016, 41 million (72%), were due to NCDs, including cardiovascular diseases (coronary heart disease, cerebrovascular diseases such as strokes, and peripheral vascular diseases), diabetes, cancers, and chronic respiratory diseases (WHO,

2018). Cardiovascular diseases (CVDs) account for 17.9 million (44%) of all NCD mortality; cancers 9 million, respiratory diseases including asthma and chronic obstructive pulmonary disease 3.8 million, and diabetes 1.6 million. Most deaths from NCDs occur in developing countries where the burden of malnutrition is also greater (Niessen, et al., 2018). Sustainable Development Goal 2 advocates for strategies to end malnutrition in all forms, including overweight, obesity, and resulting diet-related NCDs. This paper therefore focuses on the intersection between health concerns and nutrition-related NCDs, and what has to be done to move towards achieving NCD and nutrition targets.

Food systems are important to ensure health and end all forms of malnutrition (Tilman and Clark, 2014). Malnutrition is a key risk factor for NCDs and includes nutritional disorders due to deficient intake of energy (measured mainly in children as stunting and wasting) or excessive or imbalanced intake caused by unhealthy, poor quality diets (Global Panel on Agriculture and Food Systems for Nutrition, 2016; FAO, 2018). Globally, calories obtained from meat, sugars, oils and fats have increased during recent decades, while those from fibre-rich foods such as whole grains, pulses and roots have been declining (Reubi, et al., 2016). This pattern of consuming processed and convenience foods continues to rise rapidly alongside the growth of urban areas (Mitlin and Satterthwaite, 2012; WHO/UN-Habitat, 2009). Rapid growth in the urban population is also associated with increased poverty on one hand (Ravallion, 2007), and with a rise in modern lifestyles, including drinking, smoking, unhealthy diets and physical inactivity, on the other (Popkin, 1999). Urban poverty and unhealthy diets have led to state capacity issues in providing adequate care for its citizens due to an already existing overburden of communicable diseases, especially in sub-Saharan Africa.

Drivers of dietary change work at many scales. Changes in supply and demand in the food system that are mutually reinforcing through processes of globalisation, the growth of the large-scale food industry (including supermarkets and the expansion of mass marketing), and increasing income and changing employment pressures that lead to changes in eating and activity behaviours, are all significantly implicated in changing dietary patterns and associated health conditions (Branca, et al., 2019). All of these factors are closely linked with the processes of urbanisation, as changing environments and preferences interact to influence diets and nutrition.

There is strong scientific evidence to suggest an increasing clustering of NCDs with low socio-economic status, especially due to health inequalities, and that those who are poor are restricted in their ability to practice healthy behaviours, including food consumption, which promote health, thus predisposing them to diseases (Niessen, et al., 2018; Wagstaff, 2002). Moreover, neighbourhood clustering of NCDs have been reported, which may suggest important environmental and lifestyle risk factors are shared (Zaman, et al., 2015; Stanifer, et. al. 2016). Although there might be evidence to support the interaction between socio-economic status and health in low- and middle-income countries, in many African cities, including Windhoek, there remains little evidence to support this claim (Kaputjaza, 2017; Indongo and Kazembe, 2018). However, it is clear that the poor bear a disproportionate burden of disease in that they are either unable to pay for NCD treatment, or, if they do pay, it is a huge out-of-pocket cost, leaving them poorer and still vulnerable.

Changes in the food environment contribute to unhealthy diets and NCDs. However, not everyone living in an unhealthy food environment has an unhealthy diet, and not everyone who has a seemingly unhealthy diet becomes sick or experiences a significant decline in their quality or length of life as a result of their diagnosis. Rather, the health implications of food environments are shaped by a more complex set of circumstances. Some of these are intuitive: individual's consumption practices depend on their financial situation, access to cooking space and fuel, transportation, and access to prompt, appropriate, preventive and curative healthcare.

More detailed local understanding of individual and household experiences of food and NCDs, and the broader economic context in which this food system operates, are all important in identifying and leveraging local opportunities for better urban policy (Smit, 2018).

Namibia has seen a rapid increase in NCD incidence, which contributes to a high percentage of mortality. For instance, in 2018 it was reported that 43% of all deaths occurring in Namibia were due to NCDs (MoHSS, 2018). The most common NCDs in Namibia are CVDs (21%), diabetes mellitus (4%), cancers (5%), and chronic obstructive airway diseases (5%) (WHO, 2014). There is also very high prevalence of high blood pressure, which is a key risk factor for heart attack and stroke. About 29% of these deaths were in people under age 60 (Craig, et al., 2018). Once affected, people often live with the consequences of NCDs for the rest of their lives.

In Africa, food systems have undergone dramatic changes, which have had implications for nutrition and food security and, subsequently, NCDs (Eriksen, 2008; Ingram, 2011; Goryakin, et al., 2017). If a crisis occurs in any part of the food system, it is expressed in food insecurity and poor health. NCDs manifest largely due to the poor nutritional quality of foods that are available, affordable and acceptable to consumers (Misra, et al., 2011). Alcohol and tobacco use are additional key risk factors for NCDs. Over 50% of women in the age group 20–44 consumed alcohol compared to over 63% of men in the age group 20–39 (MoHSS and ICF International, 2013). In Namibia, urban dwellers were found to consume more non-basic foods, such as sugary snacks, than basic staple food, such as *mahangu* and maize, especially among children (Nickanor, et al., 2017). These dietary changes in urban areas are major drivers for overweight and obesity. In a 173-country study it was found that the country's level of urbanisation is greatly associated with the prevalence of diabetes through increased sugar intake (Gassasse, et al., 2017). In South Africa it was found that obesity, hypertension and diabetes are increasing, and that their prevalence is higher in urban areas (Mayosi, et al., 2009). A study conducted in Benin that combined metabolic syndrome and Framingham Risk Score (age, sex, smoking status, blood pressure, high blood pressure – treated or untreated, cholesterol, diabetes) concluded that diet and lifestyle explained the impact of socio-economic conditions on cardiometabolic risk (Sossa, et al., 2013).

The rise of NCDs in Africa is particularly marked in urban areas and evidence suggests that smaller cities and towns (of up to 500 000 inhabitants) are expected to lead global urbanisation (UN, 2018). These rapid changes have caused significant shifts in lifestyles and consumption and, by implication, diet-related NCD rates are expected to increase faster or be higher in major cities than smaller urban areas. However, strategies to prevent NCDs operate at the national scale and are not geographically differentiated. Nutrition strategies in several countries advocate for community empowerment to claim the right to good nutrition, but do not have clear mechanisms to enact this recommendation. There are important advances to be made in the prevention of NCDs through research on food systems and their governance at the urban and neighbourhood scales.

The Namibian situation

According to the 'National Multisectoral Strategic Plan for Prevention and Control of Non-Communicable Diseases (NCDs) in Namibia 2017/18 – 2021/22' (MoHSS, 2017), the country's health system is already burdened with infectious diseases such as HIV/AIDS, TB and malaria. Despite this, there is a rise in NCDs such as CVDs, diabetes mellitus and cancers, which are emerging as a serious threat to the health system. In 2012, CVDs accounted for an estimated 6% of all deaths (IHME, 2016). The CVD burden has been increasing since the 1990s and is projected to double by 2030. Chronic respiratory diseases and diabetes mellitus each accounted for 4% of all deaths in 2012, but this increased to 6% in women and 7% in men in 2016. Urban women were twice as likely to be diagnosed with diabetes mellitus as rural women. Cancers accounted for 5% of all deaths

in 2012. Namibia is also facing rapidly increasing rates of overweight and obesity. The prevalence of overweight among adult women increased from 38.4% in 2000 to 51.9% in 2016, while the corresponding figures for adult men were 16.6% and 27.2% respectively. Similar trajectories were observed in the prevalence of obesity over the same time period, with prevalence among adult women increasing from 15.3% to 25.4%, and that of adult men from 2.8% to 7.5% (Global Nutrition Report, 2016). The NCD epidemic is said to be driven by changing lifestyles that include increased consumption of food high in saturated fat, salt and sugar (Amegah, et al., 2018) and the changing urban food system. While the Nourishing Spaces project has focused on individual behaviours, it argues that changing diets need to be understood in the context of changing food systems and urban living conditions.

The risk factors for CVDs and other NCDs in Namibia were found to be smoking, lack of physical exercise, harmful use of alcohol, unhealthy diets and obesity. The country's strategic plan for the prevention and control of NCDs stresses that a large percentage of NCDs can be prevented by attending to four main behavioural risk factors: use of tobacco products, physical inactivity, harmful use of alcohol, and unhealthy diets (MoHSS, 2017). Despite 'unhealthy diet' being listed as a risk factor, there are no concrete strategies to target households and communities other than creating awareness, taxation on sugar-sweetened beverages, and implementing a salt-reduction action plan. Few studies in Namibia are available on the subject, with the exception of those by Guariguata, et al. (2015), which looked at the prevalence of HIV and NCDs, and Yaya and Bishwajit (2018), which, using data from the Namibia Demographic and Health Survey 2013 (MoHSS and ICF International, 2013), found that poor dietary behaviour, including inadequate fruit and vegetable consumption, is one of the major risk factors for NCDs. This growing prevalence of NCDs due to poor quality diets, and its linkages with urban food systems in an emerging economy, is the subject of this paper.

Methodology

This study adopted two qualitative methods, namely in-depth interviews with 20 people each in 8ste Laan and Evululuko, and a focus group discussion with 15 people at 8ste Laan and 27 people at Evululuko, as well as field observations. The research was conducted between March and November 2018.

Study areas

The Nourishing Spaces project works in one major and one smaller city in each of its case study countries (Namibia, Kenya and South Africa). The selection of two cities per country is important, as primary and secondary cities may be at different stages of food system and nutrition transition, and may have different capacities and resources to respond to the NCD and food system challenge. Urban policy is generally developed with primary cities in mind, but the bulk of urbanisation in the 21st century will take place in secondary cities. It is imperative that both are studied. In Namibia, fieldwork was conducted in 8ste Laan (Figure 1), a neighbourhood of Otjomuise in the Khomasdal North constituency of Windhoek (Khomas region1), and in Evululuko (Figure 2) in Oshakati East constituency, Oshakati (Oshana region).

Settled after Namibian independence in 1990, 8ste Laan is located on the western periphery of Windhoek, approximately 10 km from the city centre. The population of Khomasdal North has grown rapidly, with an annual growth rate of 5%. This is largely due to rural–urban migration. While the official poverty rate of Khomasdal North is low (2.4%) in relation to the Khomas region (5%), there is significant variation in poverty rates within the constituency. 8ste Laan's housing consists almost entirely of corrugated iron shacks. Residents access water from standpipes and there is more formal provision of electricity in the formal area of Khomasdal, but not in 8ste Laan (NSA, 2011). There has, however, been recent investment

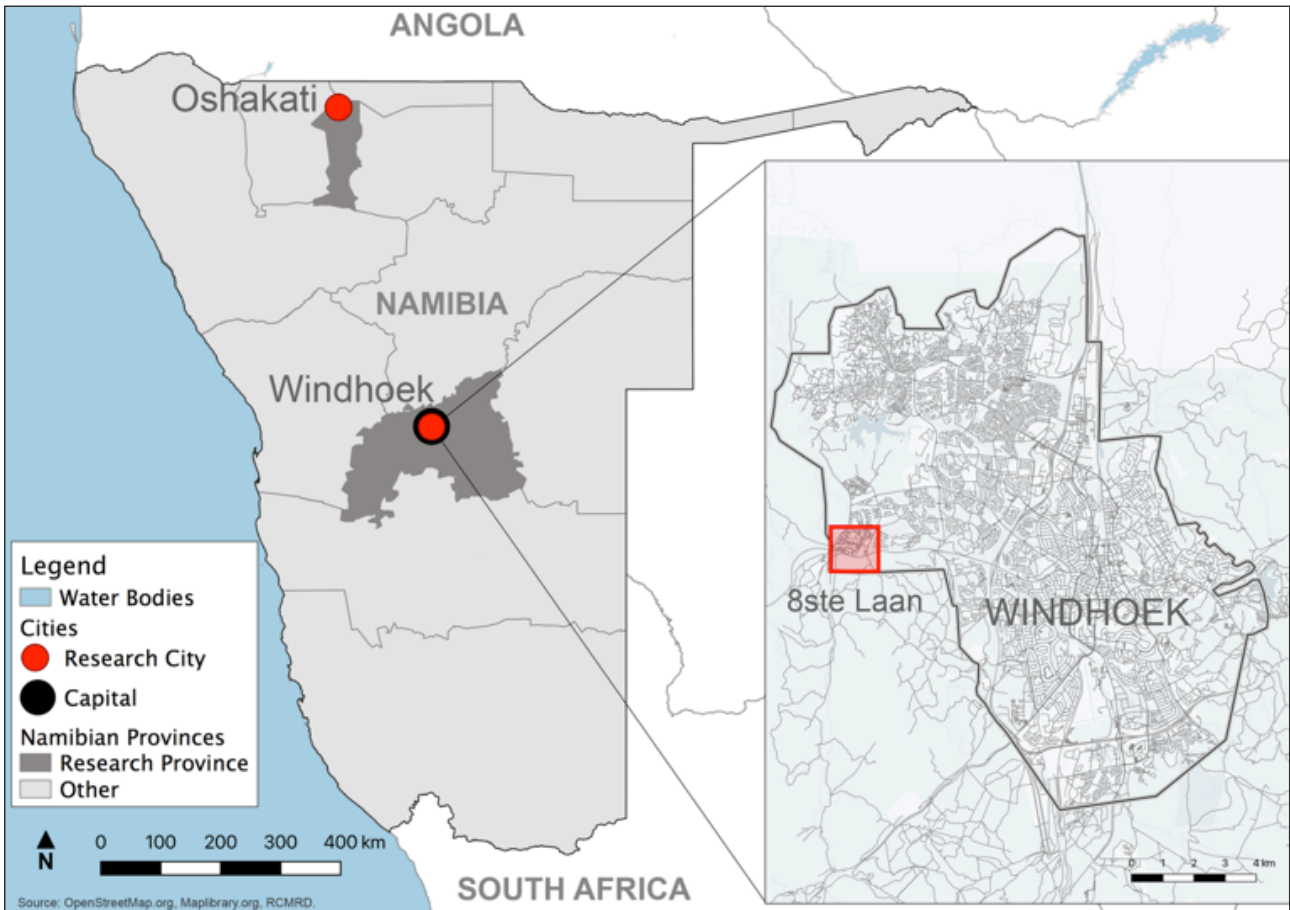


Figure 1: Map of Namibia indicating the 8ste Laan, Windhoek study site.

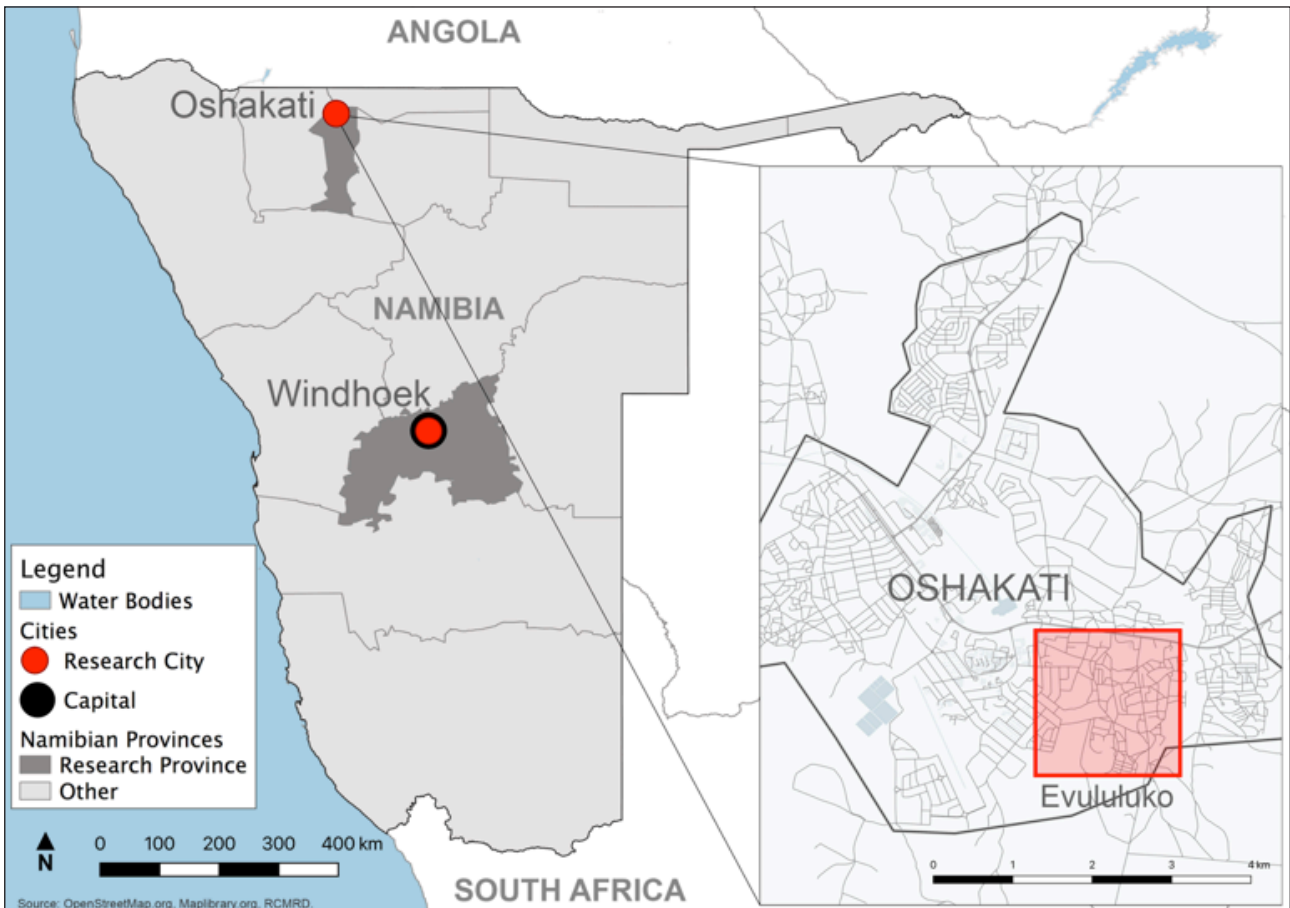


Figure 2: Map of Namibia indicating the Evululuko, Oshakati study site.

in the area, including a new clinic, a fire brigade and the Chinese-funded Chairman Mao School. There is a Woermann Brock retail supermarket that, although not actually in 8ste Laan, serves it and other informal areas within Khomasdal constituency. There are several in-home tuck shops in 8ste Laan, but most of them do not exclusively sell food. The expansion of informal food vendors in Windhoek's informal settlements comprise primarily street-food vending stands, tuck shops, mobile vendors and market stalls (Nickanor, et al., 2019a). The further these forms of trading are situated from the city centre, the more informal they are. In 8ste Laan, informal food vendors are seen at little tables in makeshift shade selling Nik Naks (cheese puffs manufactured by South Africa's Simba Chips company), sweets, fizzy drinks, fruit (of limited variety, with apples, oranges and bananas dominating), and vegetables (onions and tomatoes). Tuck shops typically sell maize flour, tinned food, cooking oil, biscuits, onions, and non-food items such as bars of soap, washing powder, and matches (to start fires).

Evluluko (meaning 'resting place') was also established after independence. Since before independence, Oshakati has been one of the most important urban areas in northern Namibia. It was often the first stage of migration for earlier migrants, moving from communal areas to Oshakati and then on to Windhoek. Along with two nearby towns, Ongwediva and Ondangwa, Oshakati played an important role during the time of the colonial regime, housing military structures and being in close proximity to Ondangwa airport. Post-independence, these towns remain major centres of development in northern Namibia. The Oshana region has an estimated population of 181 898 and, with the Oshakati-Ongwediva and Ondangwa corridor as a commercial hub, has experienced rapid urbanisation and an influx of people mainly from the rural communal areas. Evluluko is one of the most recently established areas in Oshakati and continues to grow due to this rural–urban migration. The incidence of poverty in Oshakati East (15%) is significantly higher than in Khomasdal North. Overall unemployment in Oshakati East is 37%, which is similar to that of the Oshana region (NSA, 2014). Most Evluluko residents are in low-income earning categories. The streets in Evluluko are not tarred and the majority of housing structures, as in 8ste Laan, are corrugated iron shacks, although there are a few brick rooms. According to the 2011 census, only 35% of households in Oshakati East had electricity for lighting. In the informal settlements the situation is worse, with most houses having illegal electricity connections. Incidences of fire are common. Those that have no electricity for cooking uses firewood (39%), gas (22%) or paraffin/kerosene (9%) (NSA, 2014). The area also lacks schools and clinics. Water is available from communal taps, which also makes sanitation and food preparation a great challenge.

Many residents in Evluluko and 8ste Laan have migrated from rural communal areas, yet still have strong links with their rural origins such that food remittances take place. Some Evluluko residents have multispatial households and cultivate their fields in the rural areas over weekends during the rainy season. These foods are later consumed in the urban households.

Evluluko contains several small shops, mini-markets and tuck shops (small, fixed tin structures or storage containers) and home shops, but there is no large food retailer (e.g. Shoprite or Pick n Pay). Street-food vendors, operating under the shade of plastic, cardboard boxes and umbrellas sell junk food such as sweets, fizzy drinks, crisps/chips and fat cakes (deep-fried dough), as well as other cooked food.

Evluluko location is situated on the left-hand side of Oshakati Main Road, when driving from Ongwediva, and borders Yetu Shopping Centre to the west. This shopping complex serves people living in Evluluko and other extensions of Oshakati. Evluluko residents mostly access the shopping centre on foot, while others, such as the Game Shopping Complex, Oshana Mall, and the fresh fish outlet at Ongwediva, are accessible by taxi and other means. These malls, which originate from South Africa, have

expanded throughout Namibia and have more or less the same structures and stores for clothing, toiletries and shoes, a pharmacy, and either a Pick n Pay or Shoprite food store.

The neighbourhood has several shebeens (informal taverns), which can be seen at almost every tenth household (based on field observation). While the establishment of alcohol outlets in southern African cities and towns has a long history connected to the control of labour (Mager, 1999), since independence there has been a rapid expansion, with statistics for Windhoek indicating that there are now about 5 000 alcohol outlets. Parry, et al. (2011) showed the link between alcohol consumption and NCDs – especially cancers, CVDs, liver disease, pancreatitis and diabetes – and that risk increases with the volume consumed. The presence of so many alcohol outlets in a small area has serious implications for alcohol consumption and its related impact on food security and NCDs.

Both peri-urban areas have consistent availability of food through a variety of sources, including supermarkets (Nickanor, et al., 2017; Nickanor, et al., 2019a). In a 2016 city-wide household survey conducted in Windhoek, it was found that 99% of formal housing and 94% of informal housing sourced food from supermarkets on a monthly basis (Nickanor, et al., 2019a). In the Oshakati-Ongwediva and Ondangwa corridor, 70% of the households reflected this monthly pattern (Nickanor, et al., 2019b). Since these supermarkets are not located within either site, other food sources such as the open markets, tuck shops and street-food vendors are frequented daily.

Individual interviews

Given their centrality to household food purchasing, storage, preparation and distribution, the vast majority of interviewees were women. Letters were sent to constituency councillors requesting permission to conduct research in their constituencies. In Windhoek, a community development coordinator (CDC) in 8ste Laan was nominated by the councillor's office to help with participant recruitment. A liaison officer was also recruited through the councillor's office. The CDC and the liaison officer were introduced to our rigorous research method, including the aim of the research, the kind of participants information would be collected from, the various stages of the research, and information about their subsequent participation. The researchers also familiarised themselves with the study sites.

Twenty interviews were conducted at each study site. Fanuel Namweya, the liaison officer from the Oshakati East constituency office, was given clear guidelines on the recruitment criteria and contacted potential participants, explained the purpose of the study and set up appointments. We focused on women who lived in Evluluko both before and after independence, who were engaged in food provisioning in their households and had a reasonable understanding of the changes in Oshakati. Although the study specifically aimed to obtain views from women, in order to understand the complexity of household food sourcing, food selection, consumption patterns and practices, and its links to NCDs, two in-depth interviews with men were conducted, one at each site. Including the first male participant (in Evluluko) as part of the total sample was, despite our explanation of the study protocol, instructed by the councillors based on the fact that he had lived in the urban area for a long time, had wide knowledge of the areas, and would be very resourceful. Including a male participant from 8ste Laan was done for methodological consistency across both sites. In total, 40 interviews were conducted according to the protocol developed by the Nourishing Spaces research team and approved by the ethics board. The interviews focused on: food consumption patterns at different stages in the life course; places and methods of food preparation; food preparation and consumption during special occasions; food preferences; food storage; perceived healthy food and the impact of healthy food; experiences of NCDs in the community; the perceived relationship between food and NCDs; and possible action by the community to improve health.

In 8ste Laan, our liaison officer, Auntie Sophie, runs a kindergarten and a soup kitchen, and is well known in the community. Due to the diversity of ethnic groups in Windhoek, the services of translators were used. All recordings were verified by the country lead researcher who speaks English, Oshiwambo, Afrikaans and Otjiherero. In Evululuko, all interviews were conducted in Oshiwambo.

Transcription was done by three former students of the University of Namibia. Transcribers were given confidentiality agreements to sign before they began the transcriptions. All transcripts were sent back to the researcher for quality checking along with the audio recordings that had been given to transcribers. The interviewee selection followed purposive sampling, mostly targeted at female-headed households working in vulnerable employment or engaged in informal employment, and considered poor by the community leaders.

Focus group discussions

The focus group discussions were conducted after the in-depth interviews had taken place. The liaison officer at each study site recruited participants according to the criteria for selection, which included a mixture of socioeconomic and demographic characteristics.

One community meeting was conducted at each study site, which drew a mix of participants from different backgrounds, demographical strata and socio-economic standing. They included men and women, the elderly and the youth, and those with migrant status. Participation in the community meeting was by signed informed consent. The discussions were held at a community hall and a community kindergarten, as arranged by the local

liaison officer, and facilitated by the lead researcher. In Evululuko, the community meeting consisted of 4 males and 23 females, whereas in 8ste Laan, there were 3 males and 12 females. The Evululuko community meeting was conducted in Oshiwambo and the 8ste Laan community meeting was conducted in Oshiwambo and Afrikaans. The country lead researcher is conversant in both these languages.

The starting point for the discussion in Evululuko was food consumption, healthy food and a healthy lifestyle, changing foods, and changing diets. The focus group emphasised the consumption of traditional foods obtained from rural areas that are seen to be healthy. The 8ste Laan focus group discussion started with issues of livelihood diversification and the lack of job opportunities.

Ethics

The long duration of the data-collection period was due to the ethical clearance process. While provisional ethical clearance was issued at faculty level, the final and subsequent issuance of the certificate took extremely long, seemingly due to health considerations that needed to be reviewed. It was only on 24 August 2018 that the University of Namibia's Human Research Ethics Committee (Health) considered the application FOS/416/2018. In-depth interview and focus group participants were explained their rights and each participant signed a letter of consent. Refreshments were offered to the focus group participants at the end of the session. Throughout the transcription process, materials and audio recordings were kept secure.

Table 1: Characteristics of study participants

Characteristics		Location		Total (N=40)	%
		8ste Laan	Evululuko		
Sex	Female	19	19	38	95.0
	Male	1	1	2	5.0
Highest level of education	No schooling	2	0	2	10.0
	Grade 1–Grade 7	1	2	3	7.5
	Grade 8–Grade 11	12	12	24	65.0
	Passed Grade 12	2	5	7	17.5
	Tertiary education	2	2	4	10.0
Marital status	Married, living with spouse	7	9	16	40.0
	Married, separated	0	0	0	0
	Divorced	0	1	1	2.5
	Never married	8	8	16	40.0
	Other (widow/er, cohabiting)	5	2	7	17.5
Employment status	Full-time	2	3	5	12.5
	Part-time	1	1	2	5.0
	Casual/day	0	0	0	0
	Unemployed	11	4	15	37.5
	Self-employed	6	12	18	45.0

Results

Since independence, Namibia has been characterised by a number of significant political, economic, social and geographical transformations. These have shaped food consumption patterns in several ways, as reflected in research participants' expressions of how their consumption patterns had changed over the course of their lives.

The sections below focus on how food practices have been shaped and reshaped by these transformations. There were commonalities and differences in participants' experiences in 8ste Laan and Evululuko.

The results section first provides basic demographic information on the participants. Migration has played a significant role in shaping food consumption practices and ideals, and is therefore an area of focus in this description. The results then focus on food cultures and practices, and how these have informed current food practices. A reflection on infrastructure and how it influences food access and consumption is also discussed. This section also addresses perceptions of un/healthy foods and possible links to NCDs.

Background characteristics

The study interviewed a total of 20 participants in each study area. Core demographic details are provided in Table 1. The study had a female focus, thus the majority of participants were women (38 in 8ste Laan, 40 in Evululuko), ranging in age from 24 to 72 years, with a similar mean age (mean= 41.8 years in 8ste Laan and 42.5 years in Evululuko). Figure 3 shows the age distribution of participants in the two study locations. In

both locations, the majority interviewed were aged under 50 (70% in 8ste Laan, 75% in Evululuko). Most of those interviewed had attained grades 8–11 (65%), passed grade 12 (10%), or had tertiary education (10%). With regard to marital status, 40% were never married and 40% were married. A total of 60% were unemployed, while 25% were self-employed. Some of those interviewed sold cooked food, fruit and vegetables sweets, Nik Naks, *mahangu* flour, sorghum flour and dried wild fruits). Only 10% were working full-time and 5% were in part-time employment.

Of the 20 participants interviewed in 8ste Laan, 13 were born outside Windhoek, of which 8 were born in rural areas of northern Namibia, 4 in other rural areas of other regions, and 1 was a Namibian Herero born in Botswana. The other 7 participants were born in Khomas region, of which 2 were born in urban areas of Windhoek, while the remaining 5 were born in the surrounding rural areas of Windhoek. The participants interviewed in Evululuko were all migrants from rural areas in the northern regions (8 Omusati, 6 Oshana, 4 Oshikoto, and 2 Oshana). Of the 40 participants from the two sites, more than half (n=28) were born in the northern regions. Even at a minimal scale, with such a small number of participants, this depicts the demographic and spatial distribution of the national population, with the highest concentration in the four northern regions (NSA, 2017). Figure 4 indicates the length of time participants had lived in 8ste Laan or Evululuko since migrating from rural areas. The mean length of stay in 8ste Laan was 18 years (2 years < 40 years), although a high percentage have been there for 11–20 years (30%), followed by those 0–10 years (25%), and over 30 years (25%). The mean length of stay in Evululuko was 21 years (2 years < 54 years), with about a third having been there 21–30 years (35%), and 25% in the 0–10 years range.

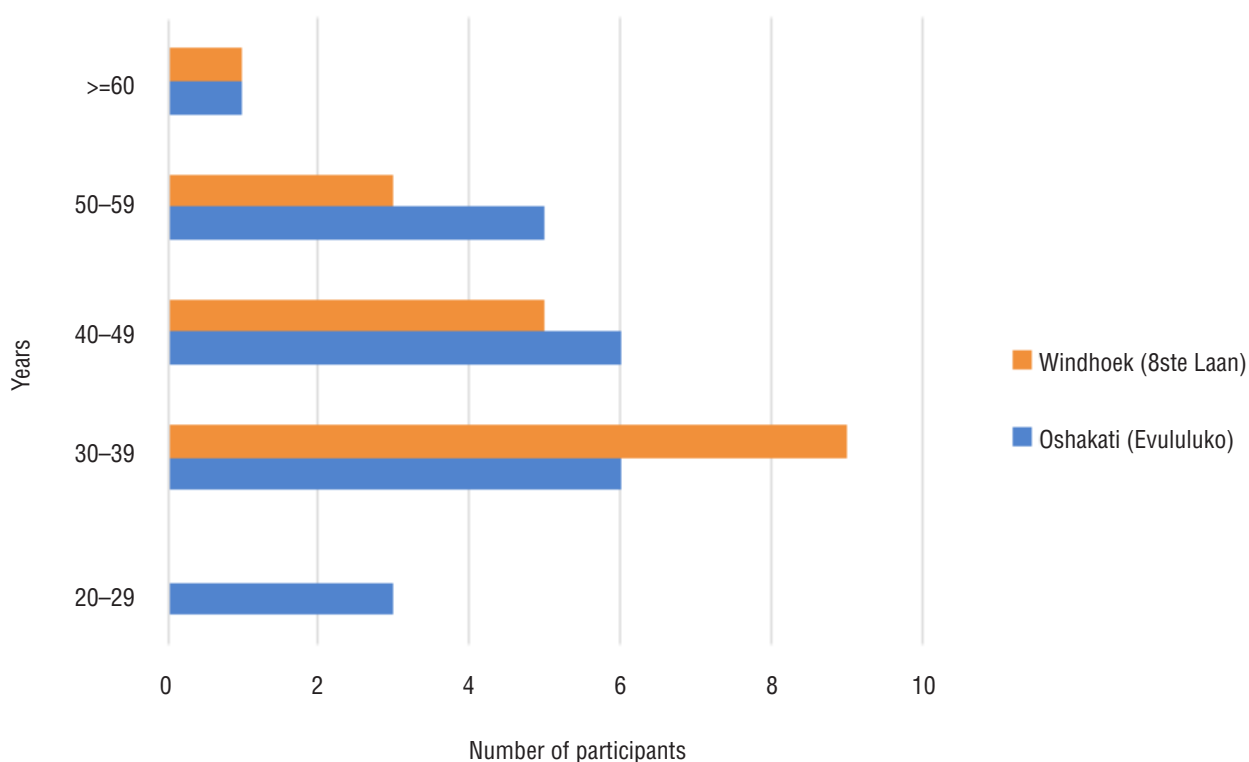


Figure 3: Age distribution of participants in 8ste Laan and Evululuko

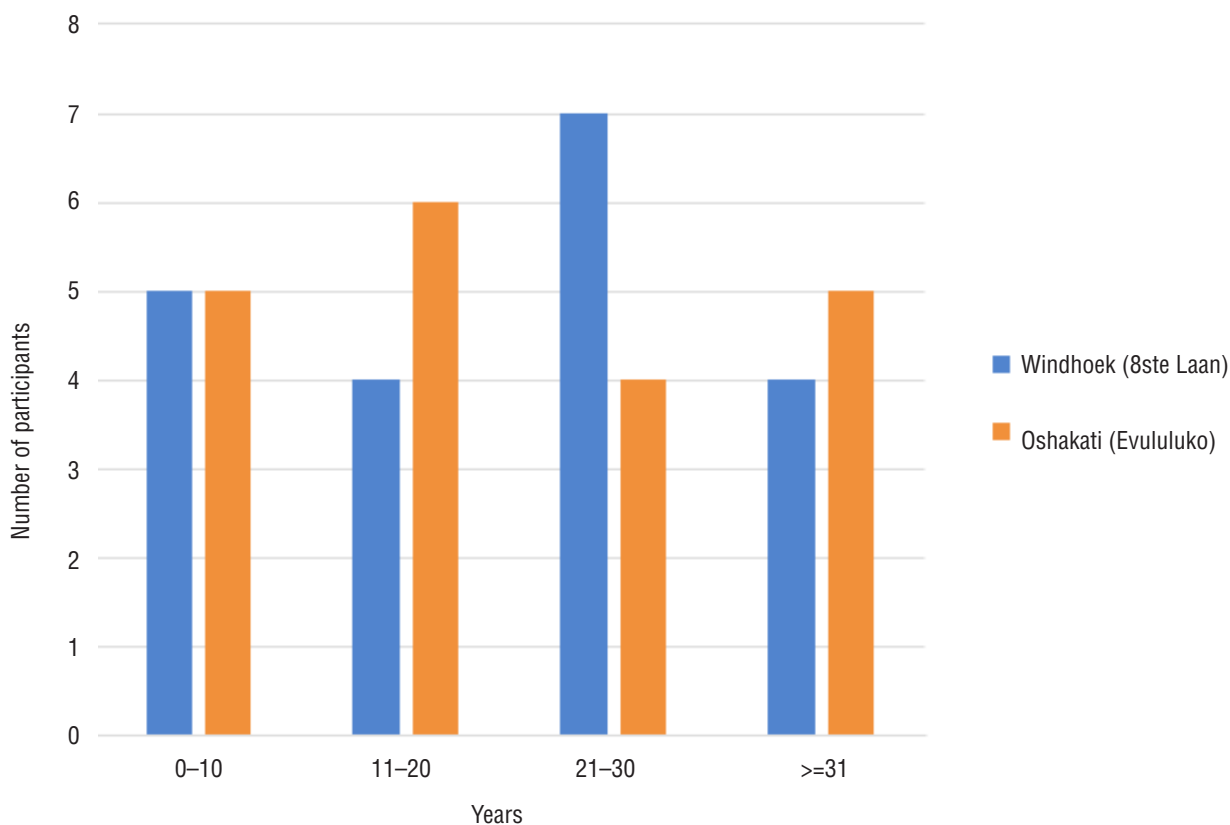


Figure 4: Length of time in 8ste Laan or Evululuko after migrating from rural areas.

Traditional food-preparation spaces and practices

Current food consumption and preparation practices are informed by traditional food practices. The majority of participants in both 8ste Laan and Evululuko were rural–urban migrants, whose food cultures were informed by traditional rural cultural practices and norms.

As most participants were from the northern regions, which are predominantly Oshiwambo-speaking, food practices were learned through Oshiwambo traditional spatial and social norms. In the Oshiwambo tradition, food is prepared at a traditional kitchen (*elugo/epata*). Usually an elugo has one traditional hut and an open space sealed off with palisades of Mopane trees, both within the hut and in an open space where three old clay pots or stones are laid in a triangular formation to mark where fire is made for cooking. During the rainy season and in summer, cooking takes place in the hut. Another hut known as *elimba* is used for storage; in wealthier homes there may be two. Firewood collected in the veld is used as a source of heat, while hand-dug wells are a source of water. Kitchen utensils consist of clay pots: big clay pots are used as cooking pots, and to store *mahangu* flour and water, while smaller small pots are used for sauce. *Omaliilo* (traditional flat round baskets made from palm leaves) are used as plates.

We used to cook at the traditional kitchen. It is a wide space. In the evening there is an open fire at the kitchen area where we prepare food. During the day we make the fire in the hut at the kitchen area which is made to prepare food. (Female, 48, Interview 1, Evululuko)

The kitchen was a big open space, with kitchen equipment such as clay pots, woven baskets. We used firewood to cook food. (Female, 52, Interview 4, Evululuko)

The Oshiwambo food-preparation space is not much different from that of other ethnic groups in Namibia, as narrated by a respondent who migrated from Omaheke region to Windhoek:

The kitchen space was big enough, because we had to make fire on the ground at the open space. We use three-legged pots. (Female, 38, Interview 29, 8ste Laan)

In the Oshiwambo tradition, food preparation is highly gendered. It was the responsibility of women to collect firewood and water. Occasionally men would collect firewood or bring huge stumps to chop up into small pieces. The kitchen is traditionally a woman's space, thus girls were trained from as young as six years of age to do things in the kitchen, including how to prepare various dishes or certain foods for specific meals. When asked 'Who cooked in your house?', two participant explained:

It was those older ladies, you know back in the days, those girls before they do not develop anything on their chest³, they are guided on what to do. If my mother is not the one cooking, or my grandmother, then the younger girls are told to ... check in the pot, add water to the pot ... until the whole process is done. In this way they learned. (Female, 34, Interview 22, 8ste Laan)

Nangula used to cook. She's the best cook. She is a girl, so she knew ... She was taught how to cook well. (Female, 49, Interview 8, Evululuko)

In large families, children would assist in preparing food and learn how to cook from the elders. As a result of this early initiation into gendered food practices, these food traditions continue to inform norms, even for those who left rural areas at a young age. In some way, this also shapes current food choices and food preferences.

Food preparation remains highly gendered, with cooking still often done by the female head of the household. One respondent said:

I was happy to know how to cook; it is a lady's responsibility to cook. We used to learn from elders when they are cooking. (Female, 46, Interview 36, 8ste Laan)

While the gender roles around food preparation remained similar across both sites, there had been significant changes in food preparation spaces. This was particularly evident in 8ste Laan where the physical space of an urban corrugated-iron shack does not allow for the traditional elugo structure. Additionally, food practices are shaped by longer term availability and desirability of modern kitchen utensils. In 8ste Laan, home kitchens contained some modern kitchen utensils, limited to the types of food households prepare (e.g. because *omahangu* and maize porridge is consumed often, a wooden spoon may be used instead of a whisk). In Evululuko, kitchen spaces are predominantly modelled on traditional Oshiwambo kitchens. This was reflected in the community discussions in terms of what is used when preparing and storing food. Some kitchens have traditional and modern features, indicating that households are adopting an urban lifestyle. However, a lack of infrastructure (e.g. electricity) and poverty prevents the acquisition of kitchen equipment that conforms to the urban environment.

Consumption of traditional foods

Perceptions of healthy food were informed by the food cultures in which participants grew up. It was noted that this extended to preparation and consumption patterns. Although these food cultures have undergone transformations, perceptions of what foods are healthy and ideal are still informed by older traditions.

Many factors influence consumers' dietary behaviours, from the personal (e.g. knowledge, skills, dietary preferences, culture and time for food preparation), to the economic and political (e.g. the cost and availability of food). In Evululuko, the types of food consumed remained traditional and highly embedded within the cultural food system, even though the conventional food system provides for alternative modern food.

A brief description of the traditional foods consumed by participants

Typical foods consumed by participants in Evululuko and 8ste Laan include *omahangu* (millet) porridge with milk or *omboga/evanda/ekaka* (spinach), pumpkin and pumpkin seeds, and melon seeds. These food types are mainly grown in the rural northern areas. *Omahangu* porridge is a staple food produced by Oshiwambo-speaking and some Kavango-speaking communities Oshikundu or *ontaku* (depending on the dialect) is a popular non-alcoholic fermented beverage in the north-central (Omusati, Oshana, Ohangwena, Oshikoto and Kavango) regions of Namibia, which is made with water, *mahangu* (pearl millet) flour and sorghum. It is an important daily beverage among the Oshiwambo-speaking people of northern Namibia, and brewed traditionally for household consumption and more recently to generate income. Serving *oshikundu* to visitors is considered a token of hospitality and part of daily social interactions. It is also produced as part of the traditional initiation of young girls into womanhood, for weddings, and for other important ceremonies. It is custom that, even if no lunch is prepared in the house, there should be *oshikundu*.

Participants expressed a desire to maintain food cultures, despite these cultures being under transition for several reasons:

The mahangu we cultivate was always enough for the entire year. Although we still eat mahangu porridge, it is now mixed with maize. It has become a culture. When it comes to beans, kids do not want to eat them, they just want rice. These traditional foods are healthy, they are cheap. If we can get

land here we will grow these kinds of foods. (Female, 48, Interview 1, Evululuko)

The availability of these foods has been reduced through changes in the rural economy. People no longer own large areas of land for cultivation, and there has been a reduction in labour due to migration to cities and towns. The impact of this has been compounded by limited rainfall. Other reasons for reduced consumption of traditional foods include the changing urban food system, which has led to the introduction of modern foods, particularly through the growing presence of large supermarkets. This increased access to more processed, quicker to prepare, and highly marketed foods is shifting food cultures within the two sites.

We would plough during summertime and food such as jackal berries were often available during the rainy seasons, and that is what we would eat. We would normally harvest a lot of millet, enough for the following year as well. (Female, 47, Interview 9, Evululuko)

The food had changed. Food was better back then when they were not a lot or rather different sorts. Maybe it's because the population has now increase and also considering the price. (Female, 57, Interview 11, Evululuko)

It has changed very much, and that is what I am saying – that if people were really there for each other, they would look into and help those that are in dire need, because things have become extremely expensive. Food is expensive, electricity is expensive, everything is expensive. (Female, 32, Interview 35, 8ste Laan)

Although some participants in 8ste Laan grew up consuming traditional foods, these have largely been replaced by a 'modern' diet, reflecting not only issues of availability, but also social, economic and other factors shaping consumption patterns.

Food has changed. Some of the food has been introduced to us which was never on the shelves. (Female, 49, Interview 39, 8ste Laan)

Migration to the city and traditional diets in transition

Namibia has diverse traditional food cultures. When individuals migrate, they bring elements of these food cultures with them, but also adapt to include other modern foods into their diets. For those coming from Owamboland (the north) to Evululuko or 8ste Laan, the common foods consumed were *omahangu* porridge, spinach, beans and *ongome* (traditional bread), *ontaku* (a traditional drink made from *mahangu* or sorghum), and milk. For example, one respondent, who grew up in the rural north mentioned that, although some type of meals have remained the same, other food types have been adopted:

We still eat porridge, but in towns we value rice, macaroni and potatoes, which we buy from the shops. We do not eat the same as we used to eat at the north. Now we mix – today is porridge, tomorrow is macaroni and potatoes. (Female, 34, Interview 22, 8ste Laan)

We mostly eat mahangu porridge and drink oshikundu, because I have a farm in the village where I plough and produce millet. As you can see in that room, I have sacks of millet that I sometimes sell in order to pay for my children's school fees, because I really produce a lot. I mostly respect traditional food because I know these foods are healthy. (Female, 47, Interview 9, Evululuko)

For other ethnic groups, it is different. For instance, the diet of Herero-speaking people interviewed in 8ste Laan included omaere (thick milk) and other milk products, and porridge made from maize meal.⁴

You know they say Herero fat, but it comes from the cow – the fat they take off and fry until it is nice and clear, and then you eat with pap, with omaere, and donkey meat at times ... [laughing]. (Female, 40, Interview 30, 8ste Laan)

Among the participants interviewed in 8ste Laan were Damara – one of Namibia's oldest ethnic groups – who consumed traditional foods like *maxau* (a fermented maize-based drink) and porridge made from maize flour and milk.

... and mostly traditional ... [laughs] we use to call it maxau. (Male Damara, 61, Interview 21, 8ste Laan)

Food did not change most of the times, so we used to eat traditional food and other stuff like rice and macaroni. They used to call it white people's food, and that time it was only white people that mostly ate it, and they did not eat those food, but now they are using it. (Female Damara who grew up on white-owned commercial farm, 53, Interview 23, 8ste Laan)

Their diets were mixed and included beans and berries, which they had also consumed while they were growing up.

Beans, berries, jackal berries – those are things we grow up eating. I felt good for these food, it gave us enough nutrients even. (Female, 46, Interview 36, 8ste Laan)

Participants indicated a change in the type of food they used to consume in the rural areas, and what these foods meant to them:

When I was growing up as a young girl in the village, we used to eat beans, milk and porridge, and drink traditional drinks like oshikundu. Looking back, these food provided us with enough energy. (Female, 54, Interview 18, Evululuko)

I felt happy, because food like nuts and beans were eaten in certain seasons, and it was in abundance. Once that season is over you have to forget them again until the following year. (Female, 47, Interview 9, Evululuko)

Focus group participants reflected on changing social structure and the collective culture of eating the same food at the same time in different seating arrangements: boys alone, men alone, girls alone, and if there were a few youths they would constitute a group of up to five people. A group would have its own *elilo*, with mahangu pap and *etiti*, and ate mainly *ombidi/evanda*, beans/mashed beans, meat and milk, which served as sauce. There is a great sense that these foods were prepared in a healthier way than they are in the city, especially among the poor urban residents.

We used to eat mahangu porridge in the village. If the household owned cows to milk, we ate oshimbwida [a thick shake made with milk and mahangu flour]. If there is nothing else, you just eat it like that without any relish or meat. There are times in the evening when people would be eating and the elders decide what the children should eat. As a child you get whatever there is, even if it is ombidi [dried spinach or spinach stew as is now known] or meat [occasionally]. Those were the common things. There were no things [fancy food items] like what people cook nowadays – where people put in cooking oil from Shoprite and other ingredients. Back then if

it is fresh meat you just put in salt and the oil will come from the meat itself. If it is evanda [dried spinach, also known as ombidi] they [women] used to make soup, sauce from marula kernel (omwai). When the food is distributed, we eat freely. When the meat is dried you can also put omwai. (Focus group discussion, 8ste Laan)

Both Oshakati and Windhoek are urban settlements that have undergone structural, social and economic changes as a result of apartheid, which constrained and limited people's ability to eke out livelihoods in the rural areas and forced them to migrate to urban areas. Population pressure was also an important factor contributing to rural–urban migration (Pendleton, et al., 2012). Rural–urban migration in Namibia reached its peak a decade after independence, but strong rural–urban links among migrants are still evident (Frayne, 2001). These links were maintained through the provision of food from rural to urban households, and it was found that deep meaning is attached to these foods:

I am grateful of the food we used to eat in the past because they were fine. That food was healthy, because these were natural food and we did not use to get sick. There was enough food in the past. The time of harvesting, we were eating fresh beans, berries and a lot of things that were from the north. (Female, 33, Interview 24, 8ste Laan)

Looking back, the food we ate when growing up was healthy, because things like spinach and milk are healthy food even though we don't see them anymore in township. We used to have fit bodies, it is not like now. (Female, 35, Interview 3, Evululuko)

The types of food consumed are also a reflection of the multi-ethnicity of the two urban areas. Different ethnic groups and age groups expressed different types and patterns of food consumption. In urban areas, mobility and interconnectedness has led to strong social relations, and new meanings and associations with food. The urban food environment has largely shaped access to food, cultural appropriateness and perceived health.

Consumption of wild foods

There is considerable evidence that urban households rely to varying degrees on an informal non-marketed supply of food from the rural areas to survive the precarious urban environment (Tawodzera, 2013). In Namibia, there is evidence that food transfers from rural households are an important food source and a critical means of support in urban areas (Frayne, 2001; Nickanor, et al., 2016). The 2008 AFSUN baseline survey found that 72% of surveyed households in low-income areas of Windhoek received food transfers (Pendleton, et al., 2012). In the sampled area of secondary cities (Oshakati, Ongwediva and Ondangwa), more than half of the households (55%) receive food from relatives (Nickanor, et al., 2019a; Pendleton, et al., 2012). Owuor (2010) has shown that, in Kenya, extensive remitting of cash, clothing, building materials, agricultural equipment and items for funerals are transferred from town to countryside, and reciprocal remitting of foodstuffs such as green maize, local vegetables, sweet potatoes, cassava, maize, millet flour, groundnuts, fruit and chicken are sent from countryside to town. In Namibia, remittances of foodstuffs from rural to urban areas include wild foods, which are part of traditional food culture. These foods are usually wild plants that have been domesticated and/or are part of the local environment. The motivation for consuming wild foods is not determined by financial constraints. In their study of food security in secondary cities, Nickanor, et al. (2019b) found that *eembe* (bird plum) is eaten as a snack (35%). Other foods consumed as snacks include *eendunga* (palm/makalani fruit) (12%) and *eenyandi* (jackal berries) (9%). Nutrition or health reasons are the main motivators

for consuming wild foods such as *evanda/ekaka* (dried and fresh spinach) (16%), *eembe* (20%), *eeshi* (15%), *eenyandi* (10%), and *eendunga* (9%).

In the interviews, participants expressed receiving these foodstuffs from their rural homes for snacking, and they are seen as important for their health and identity.

Even though we buy most of the foods from shops, we also do receive foods from the rural areas such as eembe, eendunga, eenyandi. These are consumed as snacks and they are healthy. (Female, 55, Interview 6, Evululuko)

Inter-generational differences in food consumption and food practices

Research participants identified not only that their diets had changed, but also that there were now inter-generational differences in food consumption practices. This was, in part, shaped by the impact of migration and the continued presence of some traditional foods in the diets of migrants, but also changing urban cultural norms.

Food consumed when young was also different for those who grew up in 8ste Laan and Evululuko. While the food consumed in the households might not be different, food preferences differed between older and younger generations.

When growing up, some would eat maize meal and oats or potatoes and meat, while for others this would vary (meat, at times cow's milk, traditional bread), especially when they visited rural areas.

We used to eat oihenda yo matanga [a type of melon consumed like squash]. In the afternoon we used to eat beans and in the evening we used to eat porridge and dried spinach. Meat was eaten by adults. (Female, 31, Interview 15, Evululuko)

People are tired of porridge, especially our children. Every time they eat porridge they complain and ask their mom why she doesn't buy rice, potatoes or cabbage, meat or chicken? Every day is just fish, we are tired [of it]. (Female, 51, Interview 25, 8ste Laan)

Food choices and acceptance develop over time, such that different generations consume different types of food and attach different meanings.

There seemed to be common diets across the sites as most participants had a common rural start. There was little variation in the types of food consumed before they migrated to urban areas. The focus group participants at both sites mentioned several foods they consumed when they were young: *omahangu* porridge, *ongome* (traditional bread), cow's milk, beans, pumpkin, melons, *omaere*, meat, macaroni, rice, maize meal, oats, potatoes, *oihenda yo matanga* (a type of melon eaten like squash), *ontaku*, and *omakunde gondulu* (dried beans).

In the focus group discussions and individual interviews, participants indicated that they had access to a variety of food sources, including shops and especially supermarkets. Households further confirmed that, although they continue to consume the same type of food they did when they were young, other kinds of food are also available.

Participants reflected on how food consumption practices within their households had changed over time. While eating the main meal of the day together at the same time was still common, there was variation. In some households men and women would eat separately. A number of interview participants reflected that meals were no longer habitually taken

together, with all household members eating the same foods at the same time. Moreover, the Oshiwambo traditional practice included segregating the youth and the elderly, with each group eating from its own single plate. This is still practised in some households.

Girls used to eat at the kitchen side and men on the living side [men usually sit there waiting for dinner]. (Female, 34, Interview 40, 8ste Laan)

We would eat in groups, with kids alone and elders alone. No specific or fixed time for having lunch. (Female, 32, Interview 38, 8ste Laan)

Well, no, everyone ate at their own time, because when I, for instance, when I come from school, I find people have eaten already. (Female, 35, Interview 3, Evululuko)

The freedom of movement that was possible after Namibian independence in 1990 led to widespread rural–urban migration as people left their homes to search for employment and improve their livelihoods. This fundamentally changed cultural norms around food and led to the changes in diet observed by participants, which can be attributed to many factors such as the change in physical environment, where food is produced in rural areas but purchased in urban areas; and the nature of work, changing the kinds of foods sourced and consumed. In urban areas food is increasingly sourced from supermarkets, which offer cheap, highly processed foods, and sugary and fatty foods (Peyton, et al., 2015; Nickanor, et al., 2017).

The urban food system and its influence on food choices

The food environment can be defined as 'the interface that mediates people's food acquisition and consumption within the wider food system. It encompasses external dimensions such as the availability, prices, vendor and product properties, and promotional information and personal dimensions such as the accessibility, affordability, convenience, and desirability of food sources and products' (Turner, et al., 2018). Its conceptualisation in this case study includes non-market sources and strategies relevant to 8ste Laan and Evululuko. The main function of an urban food system is to distribute high quality, safe food to urban dwellers, which depends on proper food handling and storage. However, Battersby (2019) and Nickanor (2014), reflecting on the food desert concept in South Africa and Namibia, have raised concerns about whether the proliferation of supermarkets in general and in urban poor areas in particular, improves not only access, but also dietary diversity. Although food is accessed from a variety of sources that include both the formal and informal food system in urban areas (Nickanor, et al., 2019b), limited information exists on how the urban food system influences food choices. Formal food retail comprises mainly supermarkets, whereas informal food retail has four main types of vendor: street-food vending stands, mobile vendors, tuck shops (spazas), and market stalls in designated open markets. The types of food that can be accessed are predominantly cooked foods, dry and cooked staples, and an increasing range of sugary drinks, chips and sweets.

Food choices are influenced by food retailers

In Namibia there is a well-developed and expanding supermarket sector, and a vibrant informal food-retail sector (Nickanor, et al., 2019a). This retail mix plays an important role in food provisioning. However, food retail is transitioning rapidly. Nickanor, et al. (2017) provides a detailed account of Namibia's supermarket revolution, focusing mostly on South African supermarkets in Windhoek. Windhoek and Oshakati have differentiated formal and informal markets: supermarkets (Pick n Pay, Shoprite/Checkers, Woolworths, Spar, Choppies (Ongwediva), Woermann Brock)

and mini-markets, which are mainly locally owned. Food found at these mini-markets are sourced from large supermarkets. While supermarkets were a key source of food for participants, informal food sources played an important role in the food accessing strategies of those who could not afford to buy from the supermarkets or access these out-of-settlement retailers. As one participant indicated:

We buy bread nearby here, just at a house by our neighbour. Sometimes if we hear that maybe there is sale in town, we go to town to buy once, but we don't entirely depend on Woermann Brock. (Female, 34, Interview 22, 8ste Laan)

We buy at the bus stop, especially fish and meat. Because one is able to clean the fish and dry it, so as to save some for the following days. (Female, 33, Interview 24, 8ste Laan)

Only when we go to Katutura Shoprite or Woermann Brock or this other store, do we buy meat, chips and bread. (Female, 51, Interview 25, 8ste Laan)

In Evululuko, several Angolan vendors have found a niche in informal food trading:

We usually get our food from stores such as Super Dupa and mini-markets, and now it is even easier because there are Angolans that now sell food from door to door or in the street. Their macaroni is even cheaper compared to those from the stores and also it's not time-consuming as going to the stores and stand in long queues. (Female 57, Interview 11, Evululuko)

Being in close proximity to rural homes is also an advantage as visiting household members usually return with food that may be deemed too expensive to buy from supermarkets.

I buy food from the shops and some we get from the village. (Female, 41, Interview 20, Evululuko)

We buy other food from the shops, but we get mahangu flour or grains, once after a month from the village. (Female, 35, Interview 3, Evululuko)

We buy from Shoprite, but those shops are expensive, but we target the sale date, and mahangu we take from the village. (Female, 52, Interview 4, Evululuko)

In some cases, participants indicated they would purchase food from other sources such as mini-markets or Indian-owned stores.

We buy from mini-markets, Super Dupa, and from Indian stores. (Female, 47, Interview 9, Evululuko)

Confirming the pattern in previous research findings that residents in informal settlements only shop at supermarkets on a monthly basis, one participant had this to say:

T: Could you talk about where you buy food?

R: I mostly buy food at Woermann Brock or sometimes at Shoprite.

T: How many times do you buy food?

R: I only buy food once a month.

T: Where do you buy meat, fish, chicken and bread?

R: I mostly like fish that is sold by people who sell house-to-

house. Some people sell them in buckets, whereas others sell them from refrigerators. Bread we normally buy from the mini-shops in the location. (Female, 41, Interview 27, 8ste Laan)

The majority of households in 8ste Laan source most of their food from Woermann Brock. There are also little container shops and shebeens within walking distance that sell food products. There was also a clear pattern of frequency of food sourcing, with many sourcing at least twice a month.

We buy in Shoprite, Woermann Hyper ... and those types of shops. And maybe in a month we shop three times, because we are a lot in the house. So we need to buy three times because, when you buy like twice, the food won't reach the next month. (Female 35, Interview 28, 8ste Laan)

We shop at Woermann Brock. Normally we are not so many at my place, so I buy after three weeks, which is end of the month. Sometimes it can happen that the food can get finished in the middle of the month, so you have to add sugar, etc., so it is just like that. (Female, 38, Interview 29, 8ste Laan)

Basic infrastructure such as transport, energy (electricity/gas/firewood) and water are required to ensure the safety, affordability, availability and sustainability of diets. Poor sanitation and a lack of or limited infrastructure are often conditions that inhibit food security for the poor and vulnerable in urban areas.

Energy for cooking

In both Evululuko and 8ste Laan, participants described the transition from growing up in rural areas, where cooking was done in an open space, to cooking with firewood or gas. Very few currently use electricity. The process of getting firewood also has negative effects, including deforestation. Interviewees described the impact of the different types of energy available to them on their food practices:

I have a stove in the kitchen but most of the time we cook outside because the electricity is expensive. (Female, 52, Interview 4, Evululuko)

Right now, food is prepared in the kitchen. I will stand in the kitchen and just cook at the stove and take the food from the refrigerator. I can also cook using either gas or electricity. I have both, so when electricity becomes too costly I resort to gas and firewood. (Female, 57, Interview 11, Evululuko)

I don't really have electricity appliances because electricity is also very expensive nowadays. We don't use electricity appliances at all in this house. We just use firewood, but it also becoming costly, but I prepare everything using firewood because I cannot afford electricity. (Female, 47, Interview 9, Evululuko)

I prepare my food outside there. I use firewood that I go collect from the bush. I simply take my axe and go get my firewood. But now I also get pallets from the school where I work. (Female, 51, Interview 25, 8ste Laan)

It is evident that, while households have different options to alleviate energy poverty, firewood was the most common choice. This choice impacts on air quality, which may exacerbate respiratory and pulmonary diseases.

Refrigeration

A lack of electricity shapes not only food preparation, but also food storage and food consumption practices. Among the consequences are that households tend to purchase less perishable foods, and they are unable to safely store foods after cooking. As one participant noted:

Like at this place ... because we don't have electricity here, we just cover our food. Just in a plate. (Female, 35, Interview 19, Evululuko)

This informs cooking practices and prevents bulk purchase and preparation that would enable cheaper access to healthier, less-processed foods. However, it was also noted that a lack of refrigeration could also be managed by using traditional food-preservation practices:

Since we don't have electricity, we just dry the meat and fish. (Female, 31, Interview 15, Evululuko)

This continuation of traditional food practices is an important way in which households can access food that is preferred and less processed, and avoid purchasing the more highly processed foods now entering the market.

Households considered food storage an important aspect of food security and food safety. Very few households own a refrigerator to store food, which means that some food items (e.g. fruit and vegetables) are kept in cupboards, and fish and meat are bought and consumed on the same day.

Food such as fish and chicken cannot be sliced and dried, so we normally ask the neighbours to put it in their fridge for us. (Female, 27, Interview 13, Evululuko)

I do not store fresh food because, if I get money I only get a small amount of money, then I just buy small amount of meat. Then I cook immediately because I don't have a fridge. For those foods that do not require storage – we buy food in large quantity, enough to reach to the next month. (Female, 32, Interview 37, 8ste Laan)

8ste Laan participants were aware that their purchasing patterns were also shaped by infrastructure. They noted that they limited the amount of meat (mainly offal) they purchased at any one time, not on the basis of financial resources, but because of a lack of refrigeration.

Food that require storage, we just buy enough for cooking at the time since we still do not have a fridge. (Female, 35, Interview 28, 8ste Laan)

In 8ste Laan it was observed that some households have illegal electricity connections to other homes that are used for lighting and refrigeration. The connections are not used for cooking because of the high rates that are charged and to avoid overload.

Poor sanitation and dilapidated or complete lack of infrastructure affects the ability of households to access food and are therefore critical to improving food security status.

Food sourcing strategies were informed not only by price, but also by a range of household characteristics. Most respondents indicated that they would buy in bulk at month-end after being paid. They had to pay NAD12 per trip to get a taxi to a major supermarket and, if they ran out of foods during the month, they would purchase from small shops in the neighbourhood. Some of the participants who worked outside the sample neighbourhoods indicated that they would buy food from Pick n Pay or Checkers in town on their way home from work. This indicates that the proximity of major retailers to places of work improves access to food.

Some households in 8ste Laan reported receiving food through the government's Harambee food bank initiative in Windhoek, which is managed by the Ministry of Poverty Eradication and Social Welfare as part of the Harambee Prosperity Plan.

Like now if we get Harambee, then we are eating from it. (Male, 61, Interview 21, 8ste Laan)

Transport

The impact of infrastructure on food consumption extends beyond the household into wider issues such as transport infrastructure. The general situation in Namibia is that there is little organised public transportation. What is available can be classified as follows: 'in-towns', which are individually owned private sedans that operate as taxis and do not follow specific routes; municipal buses (Move Windhoek), owned by the City of Windhoek, which only operate in the mornings and evenings during the week, and transport mainly learners and workers; and between-town minibuses (15-seater privately owned vehicles). In Oshakati there are no municipal buses; only taxis are available.

Limited public transport was identified by participants as shaping food purchases and, therefore, food choices and consumption patterns.

The shops where we buy food are further away, and we just have to survive like birds. Taxi is expensive, but we blame the fuel price. (Female, 35, Interview 3, Evululuko)

We buy food from Shoprite, unless if it is fish, then we can go buy fish at a store in Ongwediva that sells boxes of fish as a reasonable price. So you have no choice. If there is money I take a taxi to Ongwediva. If there is no money, I do not go. (Female, 55, Interview 6, Evululuko)

We take taxis, but taxis are very expensive and sometimes we walk. Like you saw earlier when I got here, I had to call the kids to meet me half way to help me carry the bag of Topscore [a brand of maize meal], because with this injury on my neck I am unable to carry heavy loads. If the taxi is to drop me til home it would require me to pay NAD24, which I don't have. Taxis are very expensive, so now we just walk long distance. (Female, 47, Interview 9, Evululuko)

It is difficult to manage the transport, for example, when you have to travel for shopping malls and to buy meat from the butchery. Then you have to take a taxi. (Female, 41, Interview 20, Evululuko)

In Windhoek, personal safety was also a concern:

You need to go with a taxi, because if you are walking, you might get robbed of the money that you were going to buy food with. (Female, 33, Interview 24, 8ste Laan)

Assistance from friends and neighbours also dictated the frequency of shopping and, by implication, the types of food sourced.

Sometimes you ask neighbours to buy for you. Sometimes you struggle. (Female, 48, Interview 26, 8ste Laan)

Sometimes if you are lucky you hitchhike, that is for NAD6 to go and coming back another NAD6, so a round trip of NAD12. Others pay up to NAD26, but if make turns at other distant shops, you can easily spend NAD100 in taxis. (Female, 51, Interview 25, 8ste Laan)

The connection between food access and transport has been informed by the food deserts concept, where those who live in food deserts often have no option but to rely on small stores with higher prices and limited quality and variety of fresh food (Wrigley, 2002; Clark, et al., 2002). In southern Africa, Battersby (2012, 2019) and Nickanor (2014) contextualise the concept for South Africa and Namibia. Transport plays an important role in Namibian households, and for those who do not own any form of vehicle, it becomes too costly to go to work, hospital, school or shopping. This cost impacts food buying ability, frequency and choices.

Perceptions of healthy food

Participants identified a link between food and health. Most agreed that good food was needed to remain healthy and that some foods were associated with poor health. The foods consumed when growing up, were perceived as healthy because they were grown naturally and cooked without adding many ingredients. Most respondents indicated that the traditional food they consumed in their youth was much healthier than the modern foods they tend to consume now.

Back then, the food was good as it used to make the body strong. It was healthy, maybe since we were harvesting them from field and they were natural as no ingredients were added to the food. (Female, 35, Interview 19, Evululuko)

Food back then was very healthy, because even when you ate, there was never a day it made you ill or maybe even upset your stomach, not at all, so the food then were healthy. (Female, 38, Interview 10, Evululuko)

The food had changed. Food was better back then when they were not a lot or rather in different sorts. For instance rice nowadays is not the same as back then, even the fish has changed ... Fish nowadays has no taste unlike back then. (Female, 57, Interview 11, Evululuko)

The food I ate when growing up was really commendable because it really had quality and it had vitamins. Growing up I hardly even went to hospitals. It was healthy because those foods were organic. (Female, 35, Interview 3, Evululuko)

That time every food was just healthy, because foods like spinach and milk are healthy food, even though we don't see these anymore being readily available in the township. We used to have fit bodies; it is not like now. (Female, 34, Interview 22, 8ste Laan)

The way in which food is prepared and handled, and a lack of refrigeration, are also viewed as causes of poor health:

It is important to eat healthy food, especially for the body and immune system, because most illnesses that we suffer from nowadays results from food that we do not prepare well. Some illness probably comes from leftovers. (Female, 57, Interview 11, Evululuko)

Several participants argued that the changing food environment was driving changes in dietary patterns and contributing to the increased prevalence of NCDs such as high blood pressure, diabetes, heart disease, and TB.

The food then [referring to the food consumed when the participant was young and food was grown in the rural areas] had quality and gave energy. It was not stored in fridges, so it didn't lose its nutrients and didn't also not become tasteless. (Female, 41, Interview 20, Evululuko)

I am grateful of the food that we used to eat in the past, because they were fine. The food was healthy, because these were natural food, we did not use to get sick now and then when we used to eat that food. These foods were nice, they built up our bodies. We don't really used to get sickness, we hardly used to visit hospitals. (Female, 36, Interview 16, Evululuko)

The changing food system has altered the nature of foods sold in shops, which are becoming more processed foods and contain fewer natural ingredients. One participant mentioned this:

Our Oshiwambo food did not change, they are just the same as they have been. But this one from the shops have changed. Back then our father used to come with jam, but now even the biscuits do not taste the same anymore. (Female, 55, Interview 33, 8ste Laan)

Respondents also spoke of difficulties around eat healthy foods because of their lack of availability. Despite the physical accessibility of supermarkets, which supposedly should increase households' ability to access and purchase healthy food, this study and the work of AFSUN in Namibia have confirmed that most poor urban residents source their food from informal food sources and only shop at supermarkets once a month. Seemingly unhealthy foods are promoted in supermarkets and, because they are readily available at lower costs, tend to be purchased by the urban poor. This brings into question whether supermarkets do actually promote healthy diets as suggested in the food desert literature (Battersby, 2019).

Some Knorr soup, spices, these braai packs and maasbanker fish are not healthy, but they are ever on sale in the shops. So we don't have a choice. These supermarkets are supposed to help us making nutritious food available on the market, they are supposed to help us remain healthy when we are not able to cultivate and produce food in our own fields which is healthy, by supplementing such, but instead they just want to make profits. (Focus group discussion, Evululuko)

Knowledge of how unhealthy diets are related to NCDs

Unhealthy diets, malnutrition and NCDs are closely linked. They are the logical consequences of, among other factors, current food systems, which have changed dramatically over the past 50 years. A focus on efficiency has seen an increase in the availability of inexpensive, high-calorie foods, often made from staple cereal crops, which have reduced hunger for many. This has, however, often been at the expense of food diversity and displaced local, often healthier, diets. Access to diverse, micronutrient-rich foods such as fresh fruit, vegetables, legumes, pulses and nuts, has not improved equally for everyone, and unhealthy foods with salt, sugars, saturated fats, and trans fats have become cheaper and more widely available. Furthermore, global demand for and supply of meat, dairy products, sugar-sweetened drinks, and processed and ultra-processed foods has increased dramatically (Ingram, 2011).

In our study, we explored the perception and understanding of the link between the consumption of unhealthy foods and NCDs. We found one respondent to be quite knowledgeable about different NCDs and their linkages to food:

Diabetes is part and parcel of less food with lots of salts or glucose which is not broken up into your blood. So it depends on what you eat also, and this people must abstain from sweet things. (Female, 49, Interview 8, Evululuko)

Heart disease is from cholesterol oily food. Unhealthy food as well contribute to it. (Female, 49, Interview 8, Evululuko)

When we enquired whether there were NCDs in her household, she revealed:

I got a boyfriend, he also has hypertension. I motivate him to drink Omega 3 and then he eats in the morning, in the afternoon, and in-between. (Female, 49, Interview 8, Evululuko)

Direct and personal links to NCDs results in some people learning more about the diseases, their causes and how to adopt healthy lifestyles. One respondent stated:

Diabetes is caused by eating sweet things, high blood pressure is caused by stress, heart disease is caused by stress as well and eating oily food. (Female, 35, Interview 3, Evululuko)

Others indicated:

A person suffering from high blood pressure should avoid spices, too much oil, too much red meat. (Female, 48, Interview 26, 8ste Laan)

My mother has high blood pressure so she doesn't eat too much fat. (Female, 38, Interview 29, 8ste Laan)

The participants in the focus group discussions were aware of prevention methods and long-term solutions for dealing with NCDs, which seem to be found in the consumption of traditional foods.

Some fruits are helpful in the prevention of non-communicable diseases. Things like tea helps one to relax and relief of stress. Don't drink coffee or take in a lot of sugar. Don't only consume one type of food. Macaroni, rice and maize is starch, mix with our traditional food, such as eenyandi, eembe; ontaku, these food contains vitamins which are needed to remain healthy. Fish contains Omega 3, eggs contain protein which is also found in meat and beans. We used to eat a lot of beans when we were young, also add vegetables. (Focus group discussion, Evululuko)

Some respondents are aware of specific remedies for NCDs:

I have high blood pressure and I am not supposed to take in food with too much salt content, because this would really have a bad impact on my health. And I have to eat before taking medication. (Female, 55, Interview 33, 8ste Laan)

Focus group participants in Evululuko were aware of NCDs in their community, their households and among neighbours. They expressed concern about the rise of NCDs in their community, and there was a strong awareness that NCDs are caused by the types of food consumed, including sugary, oily, salty and starchy foods. These diets were perceived to be unavoidable as these foods are readily available and affordable, effectively making this an issue of changing food systems and poverty. However, participants pointed out that even for those with money, eating unhealthy foods will lead to them having NCDs. Having money does not necessarily equate to having a healthy diet, but the poor in particular struggle due to a lack of resources to access healthy food, as well as safely cook and store food. Participants then called for the return of consumption of traditional foods, the intake of which is seen to be healthy.

Those diseases such as high blood pressure, diabetes, heart diseases, goitre, TB, have become common in our community. We no longer even speak of HIV/AIDS because we can go to hospitals and get medications to contain HIV/AIDS. These

diseases are due to the food we eat. The food from the shops are also not healthy. We buy because that is what is available, it's what we can afford. We use to eat a lot of meat in the old days but never got sick. But nowadays even those who have money and buy trolleys full of so-called variety of food, they get sick. People nowadays eat lots of oily food, sugary food, salty food, starchy food, and especially us Oshiwambo-speaking people. Let us stick to our traditionally grown food, those food are grown organically. Let us drink ontaku and eat mahangu. (Focus group discussion, Evululuko)

The changing social structure is also understood to impact household members' responsibilities, especially in terms of obtaining and preparing food that is healthy. Another related aspect is alcohol consumption, which was described by one male participant:

Our social relations are not good any longer. Women do not want to look after their household members, and men also do not want to take responsibilities of looking after their households. Just to prepare mahangu pap and ontaku ... this is not happening any longer and people now resort to alcohol. (Focus group discussion, Evululuko)

Conclusion

Most respondents were migrants aged 23–50 who had relocated from rural areas to urban areas, were self-employed, and trying to survive by selling food products. Of the 20 participating households in 8ste Laan, 80% were migrants who had relocated from rural areas to Windhoek. A range of meals were consumed by different households, although the pattern of consumption was similar across the day. We also found that life-course events and experiences influenced food choices, but for some households there was little difference.

Food preparation and consumption, and by implication nutrient intake, has evolved over time. While epidemiological studies have indicated the protective benefits of diets containing fruit, vegetables, legumes and whole grains, the diets found in this study were dominated by a high intake of saturated fats, sugars and complex carbohydrates. This typically exhibits Western diets with high fatty acids and low nutrient density (lots of sugars and salts), which are associated with NCDs.

The study further points to the important aspect of migration. Migrants to urban areas tend to be poor, as characterised by poor housing, limited and costly transport, living on the outskirts of towns, and the inability to afford basic services. A lack of or limited infrastructure has exacerbated food insecurity and increased the risk of NCDs. For example, a lack of electricity in the study areas has curtailed residents' ability to own refrigerators and, subsequently, their ability to purchase and consume fresh products. Migrating to urban areas has also led to displacement from sources of organic food production, thus limiting the intake of healthy foods.

While participants were able to identify several structural determinants of changing diets, including income poverty, limited access to infrastructure, poor housing, poor public transport, and access to healthy and less healthy foods due to changing retail systems, it is interesting to note that much of their engagement on the nature of the problem reverted to narratives of poor personal choices. The participants have internalised much of the state's discourse around diet-related NCDs being diseases of lifestyle, rather than being shaped by food and urban systems, despite their acknowledgement of these structural determinants.

The study also points to a lack of or disjointed policies. Although Namibia has policies that address human development and decreased mortality, these have not articulated clearly the integration of food systems and NCD prevention strategies to reduce unhealthy diets and lack of exercise.

While the national government of Namibia has prioritised food and nutrition security over the three decades since independence – evidenced by series of sectoral and multisectoral food governance platforms, plans and programmes – there are no evaluations indicating how successful these have been.

There seems to exist only limited knowledge and understanding among communities about NCDs resulting from the types of food consumed. Therefore deliberate health education efforts should be undertaken.

Respondents' perceptions of healthy foods and healthy diets were assessed. Despite knowing about healthy foods, the communities were unable to access them due to high unemployment levels. Clearly the changing food system is changing the diets of urban residents. While there were no differences in the knowledge and understanding of the links between NCDs and unhealthy foods, those in Evululuko seem to be advantaged due to its proximity to rural areas where they could grow traditional foods. Although Windhoek is expanding rapidly, perhaps faster than Oshakati, the literature indicates that obesity and NCDs are increasingly shifting from high-income to low-income individuals (Otterbach, et al., 2021). The impact of the food systems and health outcomes in smaller urban areas of Namibia is not yet fully explored.

While acknowledging growing evidence on nutrition, obesity and NCDs, solutions tend to focus on rural areas (i.e. to grow more food, support smallholder farmers, and expand social protection) and behavioural communications to address NCDs, and not the entire urban food system.

Endnotes

- 1 The Khomas region incorporates the whole of Windhoek and one rural constituency.
- 2 Households were classified as poor if they spent less than NAD520.80 per month on basic necessities (approximately USD32 in November 2020) (Namibia Statistics Agency, 2017).
- 3 The participant's reference to breasts is as a signifier of maturity.
- 4 The Herero are an ethnic indigenous people of Namibia who are well known for keeping livestock, and for their consumption of meat.

References

Amegah, A.K. (2018). 'Tackling the growing burden of cardiovascular diseases in sub-Saharan Africa: Need for dietary guidelines', *Circulation*, 138, 2449–2451. doi:10.1161/CIRCULATIONAHA.118.037367.

Battersby, J. (2012). 'Beyond the food desert: Finding ways to speak about urban food security in South Africa', *Geografiska Annaler, Series B*, 94(2), 141–159.

Battersby, J. (2013). 'Hungry Cities: A critical review of urban food security research in sub-Saharan African cities', *Geography Compass*, 7(7), 452–463. doi:10.1111/gec3.12053.

Battersby, J. (2019). 'The food desert as a concept and policy tool in African cities: An opportunity and a risk', *Sustainability*, 11(458), doi:10.3390/su11020458.

Bigna, J.J. and Noubiap, J.J. (2019). 'The rising burden of non-communicable diseases in sub-Saharan Africa', *Lancet Global Health*, 7(10), PE1295–E1296.

Branca, F., Lartey, A., Oenema, S., Aguayo, V., Stordalen, G., Richardson, R., Arvelo, M. and Afshin, A. (2019). 'Transforming the food system to fight non-communicable diseases', *BMJ*, 365.

Clark, G., Eyre, H. and Guy, C. (2002). 'Deriving indicators of access to food retail provision in British cities: Studies of Cardiff, Leeds, and Bradford', *Urban Studies*, 39(11), 2041–2060.

Craig, L.S., Gage, A.J. and Thomas, A.M. (2018). 'Prevalence and predictors

of hypertension in Namibia: A national-level cross-sectional study', *PLoS ONE*, 13(9), e0204344. doi:10.1371/journal.pone.0204344.

Dalal, S., Beunza, J.J., Volmink, J., Adebamowo, C., Bajunirwe, F., Njelekela, M., Mozaffarian, D., Fawzi, W., Willett, W., Adami, H.O. and Holmes, M.D. (2011). 'Non-communicable diseases in sub-Saharan Africa: What we know now', *International Journal of Epidemiology*, 40(4), 885–901. doi:10.1093/ije/dyr050.

Demmler, K.M., Klasen, S., Nzuma, J.M. and Qaim, M. (2017). 'Supermarket purchase contributes to nutrition-related non-communicable diseases in urban Kenya', *PLoS ONE*, 12, e0185148.

Ericksen, P.J. (2008). 'Conceptualizing food systems for global environmental change research', *Global Environ. Change*, 18, 234–245.

FAO (2018). 'Nutrition-sensitive agriculture and food systems in practice: Options for intervention', Rome, Italy: FAO. <https://www.fao.org/3/a-i7848e.pdf>

Frayne, B. (2001). 'Survival of the poorest: Food security and migration in Namibia', PhD thesis, Queens University, Kingston.

Gassasse, Z., Smith, D., Finer, S. and Gallo, V. (2017). 'Association between urbanisation and type 2 diabetes: An ecological study', *BMJ Glob Health*, 2, e000473. doi:10.1136/bmjgh-2017-000473.

Global Nutrition Report (2016). 'NCD Risk Factor Collaboration', Bristol, UK: Development Initiatives.

Global Panel on Agriculture and Food Systems for Nutrition (2016). *Food systems and diets: Facing the challenges of the 21st century*, London, UK.

Goryakin, Y., Rocco, L. and Suhrcke, M. (2017). 'The contribution of urbanization to non-communicable diseases: Evidence from 173 countries from 1980 to 2008', *Economics and Human Biology*, 26, 151–163.

Gouda, H.N., Charlson, F., Sorsdahl, K., Ahmadzade, S., Ferrari, A.J., Erskine, H., Leung, J., Santamauro, D., Lund, C., Amidei, L.N., Mayosi, B.M., Kengne, A.P., Harris, M., Achoki, T., Wlysonge, C.S., Stein, D.J. and Whiteford, H. (2019). 'Burden of non-communicable diseases in sub-Saharan Africa, 1990–2017: Results from the Global Burden of Disease Study 2017', *Lancet Glob Health*, 7(10), e1375–e1387. doi:10.1016/S2214-109X(19)30374-2.

Guariguata, L., De Beer, I., Hough, R., Mulongeni, P., Feeley, F.G. and Rinke de Wit, T.F. (2015). 'Prevalence and knowledge assessment of HIV and non-communicable disease risk factors among formal sector employees in Namibia', *PLoS ONE*, 10(7), e0131737. doi:10.1371/journal.pone.0131737.28.

Indongo, N. and Kazembe, L.N. (2018). 'Age and sex-specific risk factors for non-communicable diseases among adults in Namibia: A case study of diabetes and hypertension', *Journal for Studies in Humanities and Social Sciences*, 7 (Suppl.) 1, 20–38.

Ingram, J. (2011). 'A food systems approach to researching food security and its interactions with global environmental change', *Food Security*, 3(4), 417–431.

Institute for Health Metrics and Evaluation (IHME) (2016). *Namibia: State of the Nation's Health: Findings from the Global Burden of Disease*, Seattle, WA: IHME

Kaputjaza, D.M. (2017). 'An epidemiological investigation of risk factors for hypertension in Windhoek, Khomas region, Namibia', MSc. research thesis, University of Namibia.

Mager, A. (1999). 'The first decade of European beer in apartheid South Africa: The state, the brewers and the drinking public 1962–1972', *Journal of African History*, 40(3), 367–388.

Mayosi, B., Fisher, A., Lalloo, U., Sitas, F., Tollman, S. and Bradshaw, D. (2009). 'The burden of non-communicable diseases in South Africa', *The Lancet*, 374, 12–18.

Ministry of Health and Social Services (MoHSS) (2017). 'National

- Multisectoral Strategic Plan for Prevention and Control of Non-Communicable Diseases (NCDs) in Namibia 2017/18 – 2021/22', MoHSS: Windhoek.
- Ministry of Health and Social Services (MoHSS) (2018). 'Global Health: Namibia Facts sheet', MoHSS: Windhoek.
- Ministry of Health and Social Services (MoHSS) and ICF International (2013). 'The Namibia Demographic and Health Survey 2013', Windhoek, Namibia / Rockville MD, USA: MoHSS and ICF International.
- Misra, A., Singhal, N., Sivakumar, B., Bhagat, N., Jaiswal, A. and Khurana, L. (2011). 'Nutrition transition in India: Secular trends in dietary intake and their relationship to diet-related non-communicable diseases', *Journal of Diets*, 3, 278–292.
- Mitlin, D. and Satterthwaite, D. (2012). *Urban Poverty in the Global South: Scale and nature* (1st ed.), London: Routledge.
- Namibia Statistics Agency (NSA) (2011). 'Namibia Population and Housing Census 2011', Windhoek: NSA.
- Namibia Statistics Agency (NSA) (2014). 'Namibia Labour Force Survey', Windhoek: NSA.
- Namibia Statistics Agency (NSA) (2017). 'Namibia Inter-censal Demographic Survey 2016 Report', Windhoek: NSA.
- Nickanor, N. (2014). 'Food deserts and household food insecurity in the informal settlements of Windhoek, Namibia', PhD thesis, University of Cape Town.
- Nickanor, N., Crush, J. and Kazembe, L. (2019a). 'The Informal Food Sector and Cohabitation with Supermarkets in Windhoek, Namibia', *Urban Forum*, 30, 425–442.
- Nickanor, N., Crush, J. and Pendleton, W. (2016). 'Migration, rural-urban linkages and food insecurity'. In Crush, J. and Battersby, J. (eds), *Rapid Urbanization, Urban Food Deserts and Food Security in Africa*, New York: Springer, pp. 19–32.
- Nickanor, N., Kazembe, L. and Crush, J. (2019b). 'Food Security in Africa's Secondary Cities: The Oshakati-Ongwediva and Ondangwa Corridor, Namibia', Urban Food Security Series No. 28, Cape Town: African Food Security Urban Network (AFSUN).
- Nickanor, N., Kazembe, L., Crush, J. and Wagner, J. (2017). 'The Supermarket Revolution and Food Security in Namibia', Urban Food Security Series No. 26, Cape Town: African Food Security Urban Network (AFSUN).
- Niessen, L., Mohan, D., Akuoku, J., Mirelman, A., Ahmend S., Koehlmoos, T., Trujollo, A. and Khan, J. (2018). 'Tackling socioeconomic inequalities and non-communicable diseases in low-income and middle-income countries under the sustainable agenda', *The Lancet*, 391, 2036–2046.
- Otterbach, S., Oskorouchi, H., Rogan, M. and Qaim, M. (2021). 'Using Google data to measure the role of big food and fast food in South Africa's obesity epidemic', *World Development*, 140, <https://doi.org/10.1016/j.worlddev.2020.105368>.
- Owuor, S. (2010). 'Migrants, urban poverty and the changing nature of urban-rural linkages in Kenya'. In Crush, J. and Frayne, B. (eds), *Surviving on the Move: Migration, poverty and development in southern Africa*. Cape Town: Idasa and Development Bank of Southern Africa (DBSA).
- Parry, C.D., Patra, J., Rehm, J. (2011). 'Alcohol consumption and non-communicable diseases: Epidemiology and policy implications', *Addiction*, 106(10), 1718–1724.
- Pendleton, W., Nickanor, N. and Pomuti, A. (2012). 'The state of food insecurity in Windhoek, Namibia', Urban Food Security Series No. 14, Cape Town: African Food Security Urban Network (AFSUN).
- Peyton, S., Moseley, W. and Battersby, J. (2015). 'Implications of supermarket expansion on urban food security in Cape Town, South Africa', *African Geographical Review*, 34, 36–54.
- Popkin, B. (1999). 'Urbanization, lifestyles changes and the nutrition transition', *World Development*, 27, 1905–1916.
- Ravallion, M. (2007). 'Urban Poverty', *Finance and Development*, 44(3), 15–17.
- Reubi, D., Herrick, C. and Brown, T. (2016). 'The politics of non-communicable diseases in the Global South', *Health & Place*, 39, 179–187. <https://doi.org/10.1016/j.healthplace.2015.09.001>.
- Smit, W. (2018). 'Urban governance in Africa: An overview', *International Development Policy | Revue internationale de politique de développement*, 10, 55–77. <http://journals.openedition.org/poldev/2637>.
- Sossa, C., Delisle, H., Agueh, V., Sodinou, R., Ntandou, G. and Makoutodé, M. (2013). 'Lifestyle and dietary factors associated with the evolution of cardiometabolic risk over four years in West-African adults: The Benin Study', *Journal of Obesity*, 2013(2). <http://dx.doi.org/10.1155/2013/298024>.
- Stanifer, J.W., Egger, J.R., Turner, E.L., Thielman, N. and Patel, U.D. (2016). 'Neighbourhood clustering of NCD diseases: Results from a community based study in Northern Tanzania', *BMC Public Health*, 16, Article 226.
- Tawodzera, G. (2013). 'Rural–urban transfers and household food security in Harare's crisis context', *Journal of Food and Nutritional Disorders*, 2(5). <http://dx.doi.org/10.4172/2324-9323.1000128>.
- Tilman, D. and Clark, M. (2014). 'Global diets link environmental sustainability and human health', *Nature*, 515(7528), 518–522.
- Turner, C., Aggarwal, A., Walls, H., Hinceforth, A., Drewnowski, A., Coates, J., Kalamatianou, S. and Kandiyala, S. (2018). 'Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries', *Global Food Security*, 18, 93–101.
- United Nations (2015). *World Population Prospects: The 2015 Revision*, New York: UN Department of Economic and Social Affairs, Population Division.
- United Nations (2018). *World Urbanization Prospects: The 2018 Revision*, New York: UN Department of Economic and Social Affairs, Population Division.
- Von Braun, J., Fan, S., Meinzen-Dick, R.S., Rosegrant, M.W. and Nin-Pratt, A. (2008). 'International agricultural research for food security, poverty reduction, and the environment: What to expect from scaling up CGIAR investments and "Best Bet" programs', Washington, DC: International Food Policy Research Institute (IFPRI).
- Wagstaff, A. (2002). 'Poverty and health sector inequalities', *Bulletin of the World Health Organization*, 80, 97–105.
- World Health Organization (WHO) (2014). 'Noncommunicable Diseases (NCD) Country Profiles', Geneva: WHO.
- World Health Organization (WHO) (2018). *World Health Statistics 2018: Monitoring health for the SDGs, sustainable development goals*, Geneva: WHO. <https://apps.who.int/iris/handle/10665/272596>
- World Health Organization (WHO)/UN-Habitat, (2009). *Planning Sustainable Cities: Global report on human settlements 2009*, United Nations Human Settlements Programme.
- Wrigley, N. (2002). "'Food deserts" in British cities: Policy context and research priorities', *Urban Studies*, 39, 2029–2040.
- Yaya, S., Ekholuenetale, M. and Bishwajit, G. (2018). 'Differentials in prevalence and correlates of metabolic risk factors of non-communicable diseases among women in sub-Saharan Africa: Evidence from 33 countries', *BMC Public Health*, 18, 1168. <https://doi.org/10.1186/s12889-018-6085-2>.
- Zaman, M.M., Bhuiyan, M.R., Karim, M.N., Zaman, M., Rahman, M.M., Akanda, A.W. and Fernando, T. (2015). 'Clustering of non-communicable diseases risk factors in Bangladeshi adults: An analysis of STEPS survey 2013', *BMC Public Health*, 15. <https://doi.org/10.1186/s12889-015-1938-4>.

