Dietary Transitions in Kenyan Cities: Leveraging Evidence for Intervention and Policy to Prevent Diet-related Non-Communicable Diseases

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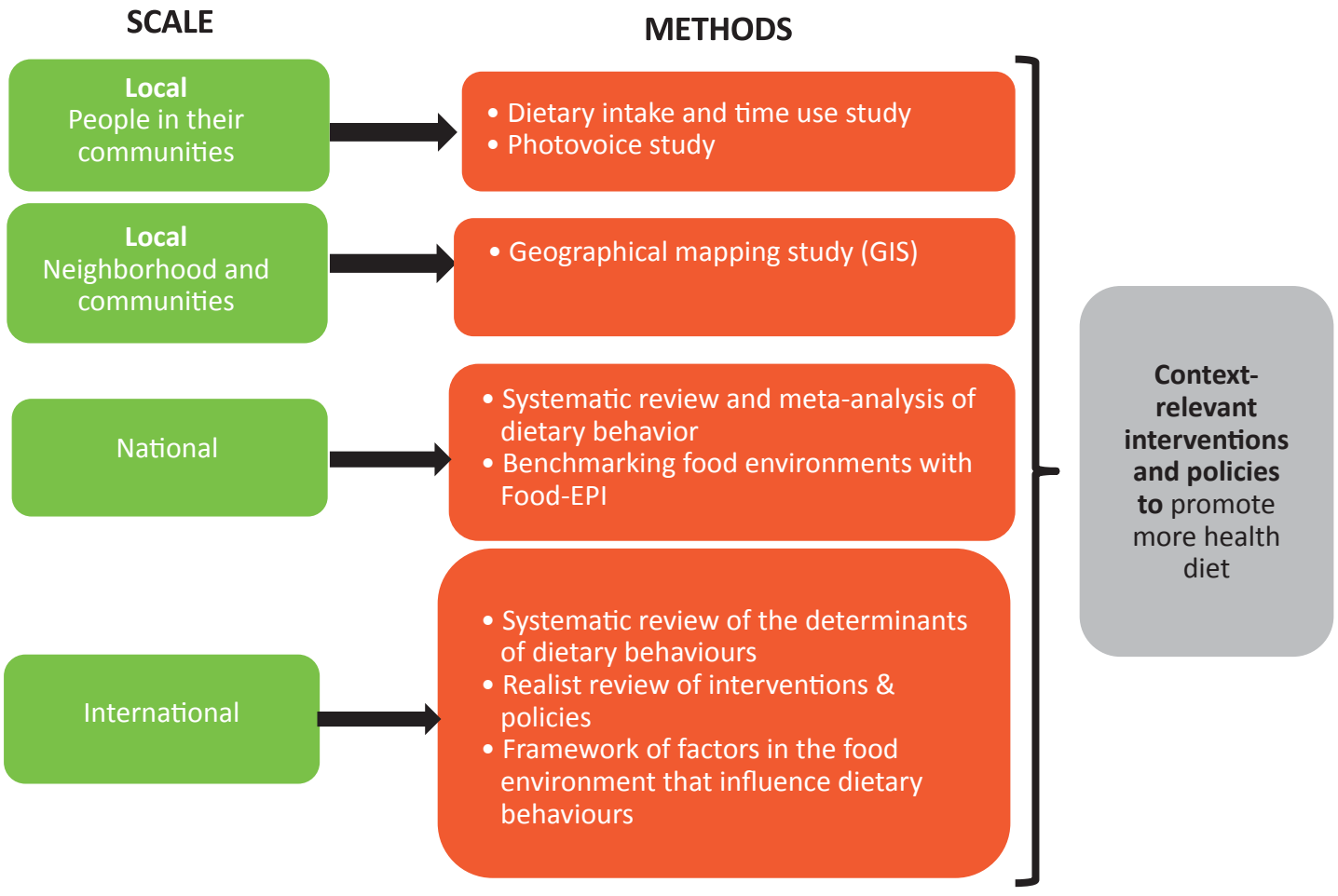
Dietary Transitions in Kenyan Cities: Leveraging Evidence for Intervention and Policy to Prevent Diet-related Non-Communicable Diseases

BACKGROUND

Kenya is experiencing a nutrition transition with some evidence of changes in dietary habits in urban areas. As a consequence, obesity and diet-related non-communicable diseases (DR-NCDs) are rapidly increasing and becoming an important public health problem, especially in urban areas.

OBJECTIVES

- To assess current food consumption patterns and practises in urban Kenya and their evolution over time.
- To examine factors in social and physical food environments of African cities that drive consumption of unhealthy foods and beverages.
- To identify context-relevant interventions and policy to improve food consumption patterns and practises (to prevent DR-NCDs).



What are the Dietary Behaviours in Urban Ghana and Kenya?

We aimed to characterize dietary behaviours of adolescents and adults and their healthiness in urban populations of Ghana and Kenya.

METHODS

We searched six online databases and grey literature for publications meeting inclusion criteria dating from 1971 to 2017. The search protocol was registered (CRD42017067718). Data was extracted on energy and macronutrient intakes; food items consumed; dietary patterns; dietary diversity and dietary practices. Meta-analyses was conducted on energy, macronutrients and food items consumed.

KEY FINDINGS

Ghana

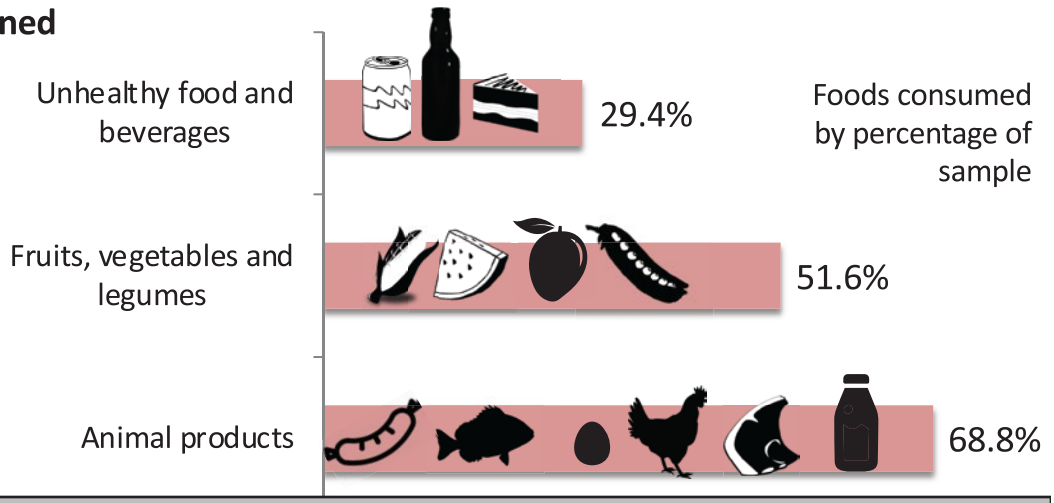
- 26 studies
- 12,065 participants and a further 1,452 households
- Mean energy intake: 1849 kcal/day (9 studies)
- Total energy intake from:
  - Carbohydrates 62.9%
  - Fat 24.7%
  - Protein 13.6%

Kenya

- 21 studies
- 8,661 individuals and a further 5074 households
- Mean energy intake: 1889 kcal/day (6 studies)
- Total energy intake from:
  - Carbohydrates 59.6%
  - Fat 25.8%
  - Protein 13.8%

Ghana and Kenya combined

- Dietary diversity scores were relatively high.
- Most individuals and households had a typical pattern of three meals per day.
- Meals more likely to be eaten outside the home were breakfast and lunch.



IMPLICATIONS FOR INTERVENTIONS

- Some evidence of nutrition transition was apparent in the relatively high consumption of unhealthy foods and drinks, and in the relatively low consumption of fruits and vegetables.
- Energy and macronutrient intake was within the WHO recommended nutrient goals for preventing nutrition-related non-communicable diseases, but fat intake was quite high (close to the upper limit of the recommended range).
- The studies reviewed were not designed to examine nutrition transition, which limits the conclusions that can be drawn.

KEY RECOMMENDATIONS FOR FURTHER RESEARCH

- Studies of dietary behavior using validated dietary assessment methods are needed in rapidly urbanizing African countries such as Kenya and Ghana.
- There is need for studies that are specifically designed to assess the nutrition transition, and measure intakes of food items such as added sugars and saturated fats.
- Evidence is needed on dietary patterns and practices, particularly around fast food and street food consumption, and eating outside the home.

What Influences People's Dietary Behaviour in Urban Africa?

We reviewed factors influencing dietary behavior among adolescents and adults living in urban Africa to identify priority areas for future research.

METHODS

A systematic mapping review was conducted to update and extend an existing review investigating drivers of dietary behaviours in women living in urban Africa, which was undertaken in 2015. The current review extended beyond women only to include men and adolescents. Electronic searches across six databases were conducted alongside forward and backward citation tracking. Findings were synthesised narratively. Factors were compiled into a map adapted from an existing the socio-ecological model based on research in high-income countries developed by Story et al. (2006) using four broad levels: individual and household factors; social environment; physical environment and macro level factors.

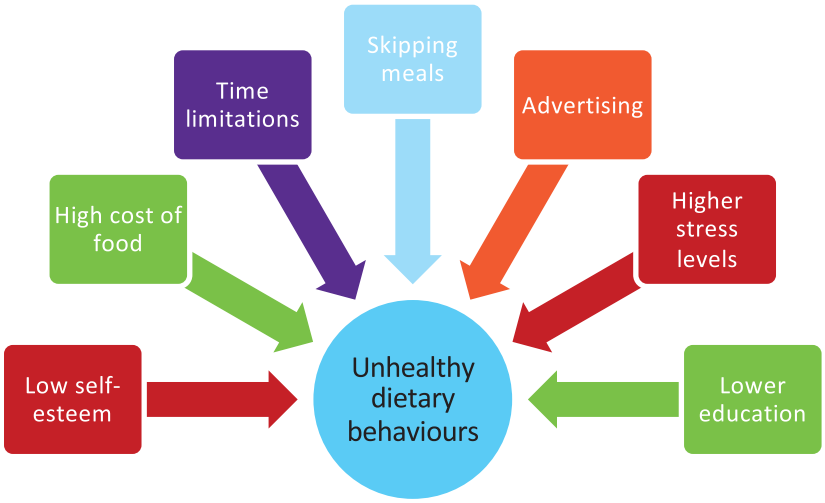
KEY FINDINGS

- 38 studies included in mixed-methods data synthesis.
- Number of influential factors identified...

Adults women- 65

Adult men- 47

Adolescents- 42



- Of the socio-ecological model, individual and household level factors were the most represented.
- Macro level factors were poorly investigated across all three demographic groups.
- Adult men and women studies identified during this review showed highly similar patterns of distribution of factors associated with dietary behaviour across the socio-ecological model levels.
- More studies of adolescents investigated factors in the social environments and less on the role of the physical food environment on dietary behaviour.

IMPLICATIONS FOR INTERVENTIONS

Interventions could be targeted at both adult men and women as our findings showed similar factors associated with dietary behaviour for both men and women.

KEY RECOMMENDATIONS FOR FURTHER RESEARCH

- Studies should be directed at investigating dietary behavior in urban populations specifically as these are often the communities most affected by obesity and other DR-NCDs.
- Qualitative studies investigating the role of factors influencing dietary behaviour must improve their reporting of reflexivity by considering the impact of the role of researcher characteristics on the data collected to improve their quality.
- Quantitative studies should enhance the control of confounding variables within studies to prevent them from introducing bias into the findings.

How are Unhealthy Food and Beverages Embedded in Everyday Life in Urban Kenya?

We explored how habits related to food consumption are structured and organized in social practices in urban Kenya, such as when unhealthy food and beverages are eaten, how quickly, where and with whom.

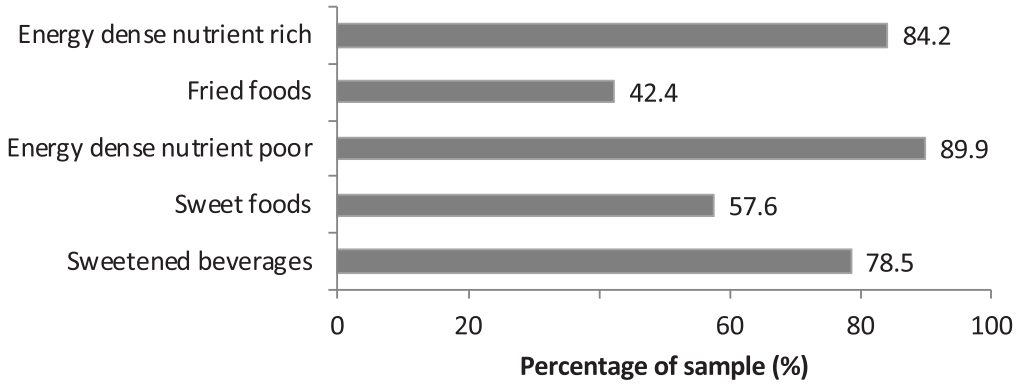
METHODS

- Study site: Deprived neighborhood in Nairobi (Makadara).
- A quota sampling method was used to recruit 144 female and male adolescents/adults aged ≥ 13 yrs.
- Qualitative 24hr recall via face-to-face interviews were conducted September to December 2017 which noted:
  - all food and drink consumed inside/outside the home in the previous 24hr period
  - time of day of the food event
  - how long a food event lasts
  - who participants eat with and where

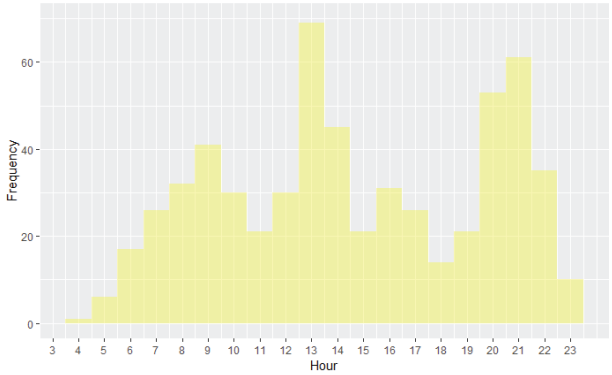
- Five nutritional outcomes to indicate the healthiness of foods were calculated:
  - Energy dense nutrient poor foods (EDNP) >225kcals/100g, <10% nutrient rich index score
  - Energy dense nutrient rich foods (EDNR) >225kcals/100g and ≥10% nutrient rich index score
  - Sweet foods, sweet or had high levels of sugar
  - Sugar sweetened beverages (SSBs)
  - Fried foods

KEY FINDINGS

Widespread consumption of unhealthy food, as well as healthy but energy dense food



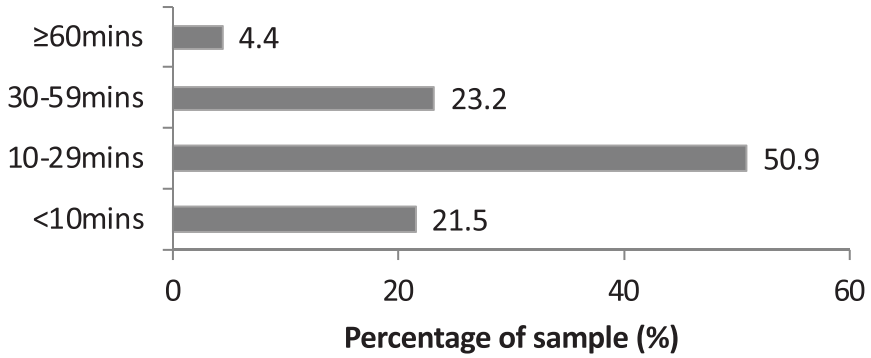
Time of day of eating episodes



- 3 main meals a day
- Sweets food were consumed more in the morning
- High consumption of SSBs at breakfast
- EDNP food peaks at meal times
- Fried foods common with evening meals
- Limited snacking in between meals

KEY FINDINGS CONTINUED…

How long an eating episode lasts



Longer eating episodes (≥30mins)

- Greater intakes of EDNR foods and EDNP foods

Very quick episodes (<10mins)

- Half (49.2% were EDNP
- SSBs less likely to be consumed

Where people eat and with whom

- Most meals were consumed with family at home (47.3%).
- Family meals more likely to be unhealthy (higher consumption of ENDP foods).
- More common in evening time and of longer duration.

- Eating alone was also quite common (41.7%).
- Most common at lunch time, associated with eating away from home

- Eating with friends was much less common (8.8%).
- Sweet foods and EDNR foods were eaten with friends.
- Evening meal most frequently eaten with friends.

- Healthier foods were consumed in schools/ workplaces.

- 12.2% of meals consumed on street.
- Street eating appears most common in the afternoon.
- May coincide with leaving work.

IMPLICATIONS FOR INTERVENTIONS

- The role of families in the social environment is key.
- Awareness about eating well with others could be developed as part of interventions
- Encourage people to choose healthier options when eating out.
- As consumption of unhealthy foods is widespread, food based dietary guidelines are needed as a tool to educate the public about eating healthier diets.
- Healthier foods were consumed in schools/workplaces, which offers an opportunity for reinforcing interventions in these settings.
- Dietary advice to consume smaller portions of traditional EDNR dishes/fried foods.

RECOMMENDATIONS FOR FURTHER RESEARCH

- Explore how work patterns and convenience are associated with dietary practices.
- Understand how dietary practices have changed over time and for different generations.

Social and Physical Drivers of Food Choices in a Low Income Urban Setting in Kenya

This study aimed to identify social and physical environmental drivers shaping food choices of individuals living in urban Kenya. Such information allows intervention development to incorporate an ecological approach in their design.

METHODS

Photovoice, a participatory photography method was used to identify aspects of the social & physical environment that influence food choices.

- A quota sampling method (based on age, BMI, occupation and economic status) was used to recruit individuals (n=50) living in Makadara, a low-income, densely populated suburb in the city of Nairobi.
- Data was collected from May-December 2017.
- Participants were asked to take photographs of: places where they eat, things that influence what they eat in their neighborhood, someone who influences what they eat, things that make eating healthy easy and things that make eating healthy difficult.
- Follow-up in-depth interviews focused on participants telling the 'stories' of their photographs.
- Thematic analysis was used to identify specific themes from the interviews using Nvivo.
- The codebook for analysis was developed using a combination of: a priori themes from the socio-ecological model developed by Story et al. (2006); and ii. emerging themes.
- Matrix comparisons were generated to compare themes between responses in this area.

KEY FINDINGS

Physical environmental factors influencing food choice…

Street foods: Readily available, convenient and accessible, but with concerns on poor hygiene

"Even when you go now you will find many women there some cooking chips and other snacks for children like bhajia but it is an open place...I don't have time to cook mandazi, chapati it is a big process. I also go to work, those ones with dirt are the same ones that I buy. I ask for five mandazis, 2 chapatis if she is not around I take 4 mandazis. I came here in the 70s, and I have always eaten this food, so it is God who protects us." (Male, 50 yrs and above, Low to middle SES-0TI 13)

Poor environmental sanitation, a major concern and influence on where food is bought

"This is where I pass when going to looking for something to eat. When I pass by such a place, I feel disgusted. You can even lose your appetite." (Male, 19 to 49 years, lowest SES – CHE) "…You know there is this outbreak of cholera and you can see what is there… let's say you purchase a mango and you know the children you know not wash it before eating." (Male, 19-49 yrs, Low to middle SES – MAL 22)

Food adulteration , a major concern on food safety

"This milk is important for the body. But you know some people put in [margarine] and a chemical to preserve milk for long." (Female, 50 years and above, lowest SES – CHE 7). "..it is good if the government knows so, especially in urban areas…people need to be told to avoid some foods like the ones in cans ...because the preservatives are the ones that are bringing problems to the body… those are poisons we add to the body that bring cancers those funny diseases." (Female, 50 years and above, Lowest SES – OSO11)

Urban Farming: Supplements family food needs, cheap, healthier

"This is my own garden where I have planted greens. If I want greens when the rain is good, I do not have a problem." (Male, 50 yrs and above , lowest SES – MUH 13)

"…I eat eggs almost every time because I have them, it's not like I go to buy them. I use them because I have my own chicken in the house and so if I want eggs I just break one and cook." (Female, 50 yrs and above Lowest SES-OSO6)

Social environmental factors influencing dietary behaviour

Parental influence: Food purchased, prepared and eaten by children

"I really do not love melon, it is my mum who influences me to eat melon because she loves it a lot."(Female, 19-49 yrs, Lowest SES, NYA 18). "We (children) like spaghetti but my mother does not like it so we don't cook it that much." (Female, 19-49 yrs, Lowest SES - OSO 2)"

Spousal influence : on food prepared and eaten

"This is my wife ...most of the time I am tired and I don't have an appetite but when I find her at home, she makes my eating easier then also she influences me to eat because she knows the food that I like." (Male, 19-49 yrs, low to middle SES –OCH 4)

Child influence: On food purchased and prepared in the household

"These are (my) children eating Githeri (mixture of maize and beans). Githeri is their favorite meal, they make me prepare it every time. In fact we eat it around 3-4 times a week. This is important.. because I value and love them (my children)." (Female, 19 to 49 yrs, Low to middle SES – ACH 7)

Family habits: Influence individual choices

"As you can see there, we have vegetables, 'ugali' (maize meal) and some fruits. The photo was taken in the house. My family influences what I eat. Most of the time, we eat vegetables because my uncle is vegetarian and my mum likes the traditional vegetables." (Female, 19 – 49 yrs, Low to middle SES – MUH 12)

Food vendor's services, prices and friendliness influence on where food is bought

"I normally buy (vegetables) there…because the price is cheaper, and the woman also knows how to talk to people. When she prepares vegetables for you, she washes them before cutting. In these other places, they just cut without washing." (Male, 50 yrs and above, Low to middle SES – OSO 11)

IMPLICATIONS FOR INTERVENTION

- Food safety and neighbourhood environmental sanitation need addressing.
- Enforce legislation and regulation around food hygiene standards.
- Policies to ensure food is affordable are needed to enable healthy dietary choices.

RECOMMENDATIONS FOR FUTURE RESEARCH

- Community engagement to work on interventions to improve food hygiene and the home food environment.
- How concerns about food safety push people to eat diets that are unhealthy for NCDs.

How is Food Sold and Advertised in Urban Kenya?

We aimed to characterize the food being sold and advertised within deprived urban neighbourhoods.

METHODS

A full audit of all food shops and vendors selling foods and drinks, as well as stand alone advertisements, were surveyed in Makadara (Nairobi) between September and December 2017. We recorded what type of outlet it was, all items being sold, whether there were any adverts and what they were (type and item being advertized). The latter was also recorded for stand alone adverts. GPS location was recorded as well.

KEY FINDINGS

- Informal vendors (e.g. kiosk, local sellers, table tops) were common (71% of all outlets).
- Energy dense nutritional poor items were more commonly sold in formal outlets.
- Energy dense foods particularly fried and processed foods (36%) were commonly available, as were sugar sweetened beverages (37%).

- More healthy foods were also available albeit less common e.g. grains/staples (37%), vegetables (38%), and eggs (37%).
- 23% of all outlets contained at least one advert.
- Sugar-sweetened beverages (48%) was the most common items advertised (few other items were advertised).
- There was low availability in alcohol sold (8.3%), but not advertised (20%).

IMPLICATIONS FOR INTERVENTIONS

- Regulate the location of advertisements of unhealthy options (or countering these messages).
- Alcohol licensing has been effective at reducing availability of alcohol (as shown by our data) suggesting that regulation of availability can be effective (but not advertisements).
- Informal (small-scale) vendors are generally healthy in nutritional terms, so interventions could focus on formal outlets.
- Healthy foods were widely available, suggesting that addressing availability alone might not be enough, but financial accessibility needs addressing.

RECOMMENDATIONS FOR FURTHER RESEARCH

- Explore how accessibility to foods sold and advertised is associated dietary behaviours.
- Examine broader aspects of accessibility including acceptability of foods and affordability.
- Extend the approach to more neighbourhoods to understand how representative the findings are and how environments change across cities.

What are the Priorities for Policy and Interventions to Improve Diets at National Level?

We aimed to assess the extent to which the Government of Kenya is implementing policies on the promotion of healthy food environments (FE) to derive priority actions to improve diets.

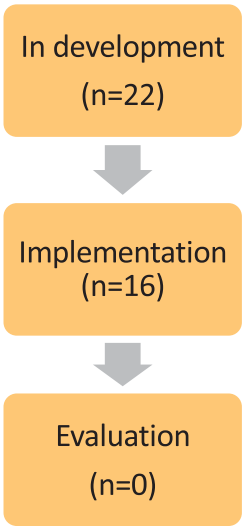
METHODS

- The Healthy Food Environment Policy Index (Food-EPI) produced by INFORMAS (International Network for Food and Obesity/NCDs Research, Monitoring and Action Support) was used for the assessment.
- Between October 2017 and August 2018 a cross-country team of researchers trained by a Food-EPI expert implemented the Kenya Food-EPI exercise.
- Using a comprehensive evidence pack developed by researchers and validated by government officials, a panel of 16 local experts rated the extent of Kenyan government action against the local policy development cycle ('initiation', 'in development', 'implementation' or 'evaluation') and against international best practice.
- Actions for the government to improve the food environment were proposed and prioritized taking into account perceptions of the relative importance (i.e. perceived need, likely impact and equity) and achievability of each action (i.e. feasibility, level of acceptability to a wide range of key stakeholders, affordability and cost-effectiveness).

KEY FINDINGS

Government of Kenya performance in relation to the local policy development cycle

- Government action was judged to be in **'implementation' phase in approximately one third of all areas of good practice**
- **Approximately half of the indicators of good practice (22) were judged to be only 'in development',** including action to: restrict the promotion of unhealthy foods to children; ensure food pricing policies promote healthy choices; support in-store availability of healthy foods; and protect trade regulatory capacities related to nutrition.
- **No evidence of any government action was documented for 5 policy areas of good practice:** establish food composition standards/targets for out-of-home meals in food service outlets; front-of-pack or menu board labelling systems; risk assessments for trade agreements; or zoning laws on the density/location of healthy/unhealthy food service outlets



Government of Kenya performance at the level of international best practice

Medium (n=4)

Low (n=34)

Very little (n=2)

- **Policy areas performing relatively well 'medium':** restricting the marketing of breast milk substitutes; demonstrating political leadership; having a comprehensive implementation plan linked to national need; and ensuring all policies are sensitive to nutrition
- **Policy areas performing 'low':** food composition, food labelling, food provision, food retail and food trade and investment
- **Infrastructure support actions performing 'low':** governance, monitoring and intelligence, funding and resources, and platforms for interaction
- **Policy areas performing 'Very little':** actions to reduce taxes on healthy foods and increase taxes on unhealthy foods

KEY FINDINGS CONTINUED…

A total of 23 actions were identified and prioritised for creating healthier food environments

Food EPI Policy Domain		Recommended action
Highest importance and feasibility		
	Leadership	Incorporate a food systems approach, anchored in the SDGs and with a focus on sustainable diets and healthy and diverse consumption (SDG12) in Kenya's food policy going forward.
	Food promotion	On advertising and marketing, develop a policy framework of engagement with commercial processed food producers to ensure regulation and standards that should be enforced and punitive measures legislated against.
	Food labelling	Ensure that food policy includes international best practices to eliminate trans fats and where some percentage is included to label (in line with recommendations) and issue "traffic lights" warnings.
	Food labelling	Ensure that food labelling is standardized and explicit to the nutrition profile of the processed food.
	Food composition	Ensure that food standards for processed foods include information the energy density for different target groups (and ensure that this is accompanied with serving guidelines).
	Food prices	Establish tax policies that favour production and consumption of healthy foods and discourage unhealthy foods, e.g. offer tax relief or reductions to farmers and traders of healthy foods, especially fruits and vegetables.
	Health in all policies	Integrate health and nutrition in all stages of government planning and budgeting to ensure that there is a high impact on nutrition (including mainstreaming of nutrition in health systems).
High importance but less feasible		
	Food prices	Increase taxes on unhealthy food and drink products and on restaurants that sell fast foods to increase their prices.
	Trade and investment	Ensure that there is a proper trade policy that targets risk assessment, food safety, hygiene and percentages of sodium, fats, trans fats, to ensure the importation of healthy foods/regulate the importation of unhealthy foods related to NCDs
	Food provision	Introduce policy to provide healthy foods (e.g. legumes, fruits, vegetables) in government-funded food programs
Lower importance and feasibility		
	Leadership	Ensure that existing policies that cover nutritional issues and risk assessments on healthy foods based on NCDs are properly implemented and enforced by government.
	Platforms for interaction	Ensure that Technical Working Groups set up by government to look into issues and policy gaps include experts from different fields (e.g. agriculture, nutrition, health).
	Food prices	Develop policies on capacity building which enable the production of more healthy food and reduce its price.
	Funding and resources	Encourage evidence-informed policymaking and budgeting, and support and fund the requisite research on food environments/NCDs at national and county level.
	Governance	Increase parliamentary capability and interest in healthy eating practices related to reducing NCDs.
	Monitoring	Develop a non-communicable disease monitoring and evaluation framework for Kenya.
	Food promotion	Develop public education campaign related to healthy eating and NCD prevention.
	Funding and resources	Ensure funding is provided to support research that cuts across the country's population (i.e. categorizing by age, gender) to support implementation of action plans to curb issues related
	Funding and resources	Invest more funds in food environment infrastructure
	Other: Food safety	Review and enhance existing food safety measures.
	Platforms for interaction	Intra-departmental working arrangements should to be developed.
	Governance	Develop an accountability framework for government policy makers.
	Platforms for interaction	Ensure meaningful participation of underserved communities throughout the policymaking and feedback process

Conceptual Framework of the Factors Driving Dietary Behaviour in Urban Africa

The aim of this task was to develop a conceptual framework of the factors influencing dietary behaviours in urban Africa to identify key factors for research prioritisation and intervention development.

METHODS

Phase 1: Generation of factors:

i. Systematic mapping review of factors influencing dietary behaviours.

ii. Findings from our two projects (DFC and TACLED)

iii. Expert knowledge on factors influencing dietary behaviour in African cities

Phase 2: Framework evaluation

Online survey with members of the African Nutrition Society. Undertook a rating and consultation activity at the African Nutrition Epidemiology conference (ANEC) 2018 in Ethiopia aimed at the following:

i. Gathering their views on the priority factors for research and interventions

ii. Appraising the content validity of the framework and its usefulness for research and interventions planning.

KEY FINDINGS

Africa specific factors that emerged

Macro (n=11)	Seasonality Religion Food labelling	Zoning policies Resource of nutritionists Dietary guidelines Social media use	War Weather Home gardening Road safety
Physical (n=7)	Household sanitation & hygiene Neighborhood sanitation & hygiene Housing condition Home food stocks		Food adulteration/contamination Cooking facilities Food storage facilities
Social (n=7)	Food allocation Communal eating House-help	Traditional taboos Household composition	Food vendor reputation Marital status
Individual (n=23)	Women's empowerment Workload in home Female-headed house Shift work Migration history	Pregnancy/lactation Allergies Smoking; Alcohol Body satisfaction Wealth	Physical activity level Speed eating Physical/mental health Familiarity with food Weight status

- The quality of the framework was judged to be **"comprehensive"** by three-quarters (n=62) of participants.
- Over two-thirds (n=57) of participants indicated that **they would consider using the framework for developing interventions**

IMPLICATIONS FOR INTERVENTIONS

- Develop interventions that address the Africa-specific factors that have emerged.
- Policies to reduce the price of more healthy foods should be explored.
- Focus on developing home-based family interventions to improve dietary habits.

RECOMMENDATIONS FOR FURTHER RESEARCH

- Research the broader food environment (the physical and macro levels) as well as causal models and pathways of the factors that influence dietary behaviours.
- Include longitudinal studies of dietary behaviors across the life course, particularly of young people and older adults as this framework focused on adolescents and adults.

Policy Recommendations

Key findings…

- Drivers of food choice across all the different food environment levels are important- suggesting policies and interventions are needed at multiple levels.
- There are almost 50 factors that have emerged as additional influences of food choice in the urban African context that are not captured/accounted for in existing portfolio of recommended interventions to prevent NCDs. Interventions that address Africa specific factors are needed.

The studies summarised in this booklet involved collaborative work involving six universities and research institutes in Ghana, Kenya, France and the UK, involving the following individuals:

School of Health and Related Research (ScHARR), University of Sheffield, UK

- Prof. Michelle Holdsworth (Principle Investigator)
- Dr. Robert Akparibo (Co-Investigator)
- Dr. Amy Barnes (Co-Investigator)
- Dr. Andrew Booth (Co-Investigator)
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Loughborough University, UK (School of Sport, Exercise and Health Sciences; School of the Arts, English and Drama)

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CIRAD (French Agricultural Research Centre for International Development), UMR MOISA,

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