Assessing Food Environments, Population Diets and COVID-19 Impacts: Evidence from Sri Lanka's Urban Underserved Settlements

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INSTITUTE OF POLICY STUDIES OF SRI LANKA

Outline

1. Motivation & background
2. Research objectives
3. Conceptual framework/ methods, data & sample
   - 3.1 External domain
   - 3.2 Personal domain
4. External domain: Designing a RFE tool
5. Personal domain: Household survey
6. Conclusion and next steps

Motivation

- Food environments can be described as the variety of food that is **available, affordable, convenient, and attractive** to people in a given context
- Retail food environments (RFEs) that promote **energy-dense, cheap and palatable foods** have been recognized as a key driver of unhealthy diets and NCDs
- **Urbanization-driven rapid changes in RFEs** has led to increased policy attention on how FEs shape population diets
- **Limited research available in LMICs** due to the dynamic and complicated nature of RFEs, lack of comprehensive data, and wide range of food sources
- **Key research gap** given many fundamental differences between HICs and LMICs

Economics of Obesity

- Health-promotion efforts have focused on education, skills training, and social support to help people change behaviour
- But these approaches cannot combat the **powerful economic factors that influence eating**

"I am convinced that we won't understand why we have an obesity epidemic or learn how to deal with it until we figure out the economics of it all"

Director of the Center for Human Nutrition, University of Colorado, USA

Source: The Lancelet, 2004

Public Health vs Economics

- Unhealthy eating reflects **bad decisions**
- All that matters is health
- Aim is to **change preferences**

Public health

- People can still be making **rational decisions**
- People care about health, but also about a lot of other things
- Aim is to **change costs and availability** (when market failures exist)

Economics

" Obesity is, profoundly, a socioeconomic issue, and medical approaches will not work."

Director of Center for Public Health Nutrition, University of Washington

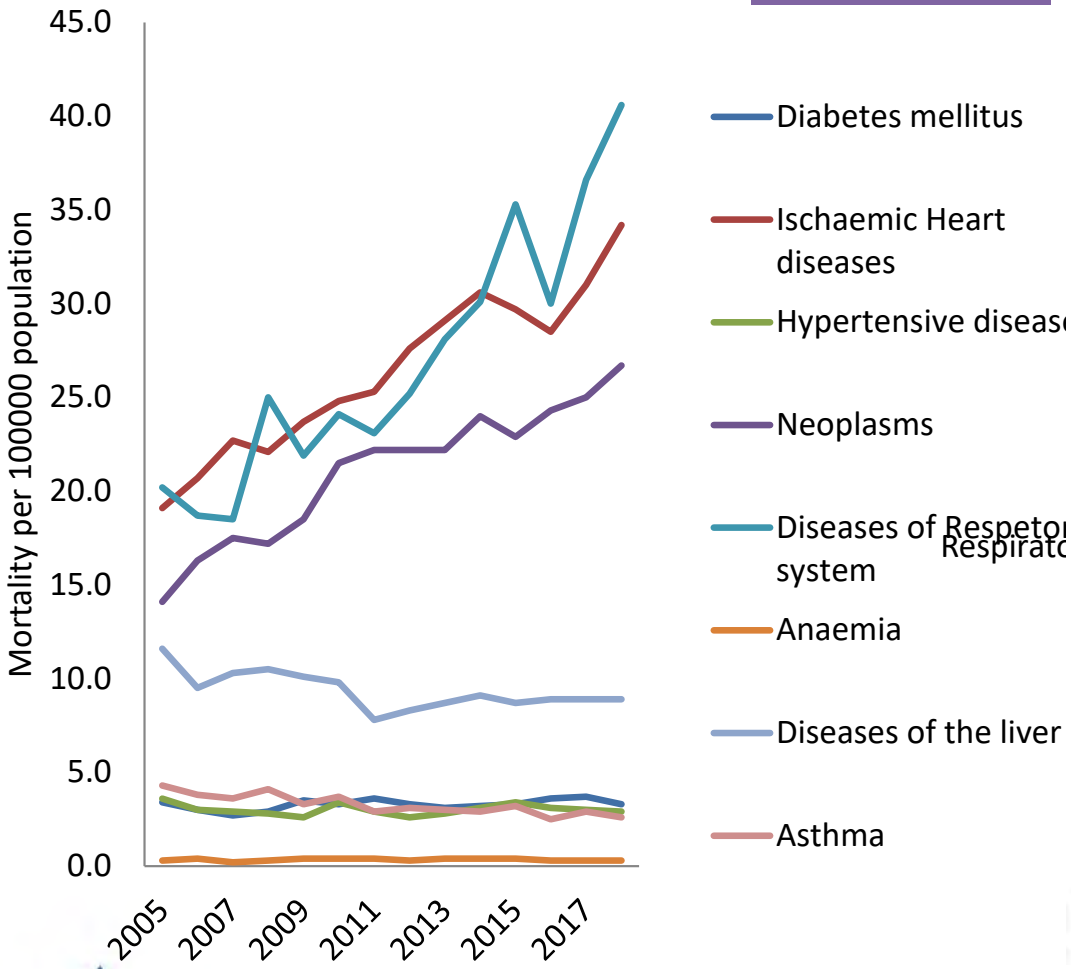
Urban Underserved Settlements (USSs)

- LMICs are home to a high number of urban poor who live in USSs
- Characterized by low-quality housing, insecure property rights, congested living, limited basic services and sanitation and poor access to healthcare
- Face disproportionate barriers to accessing healthy food, and prioritizing healthy dietary practices often takes 2nd place to meeting basic needs (The Lancet, 2016)
- Hotspots for spread of COVID-19, and disproportionate impacts on food systems and food environments

Sri Lankan context: Health

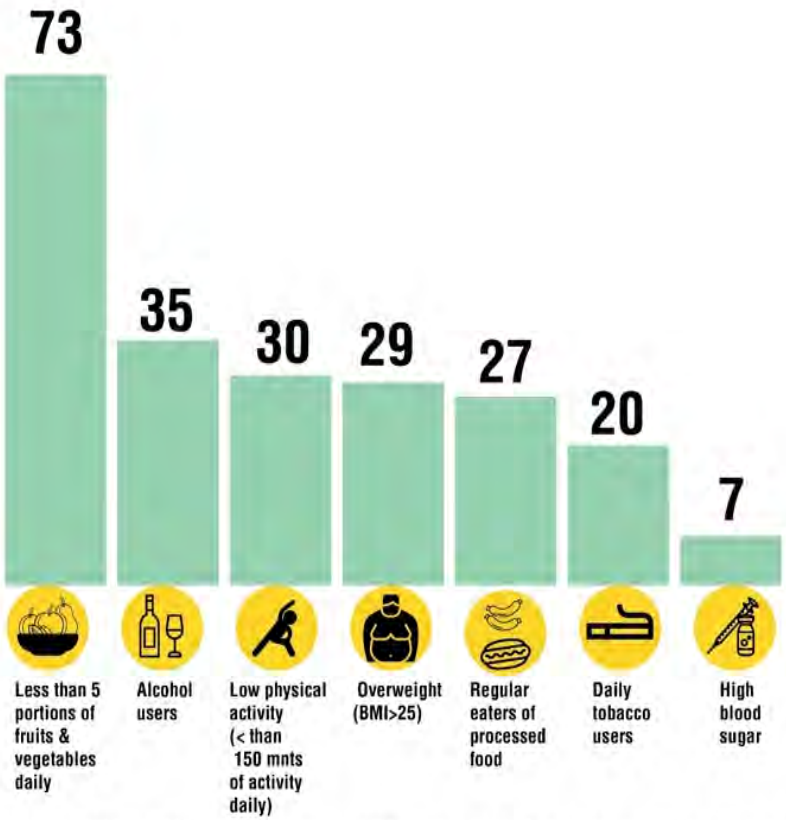
NCD-related Mortality Rates, 2005-2017

83% of total deaths



Source: Ministry of Health (2018). *Annual Health Bulletin*

Share of Adults engaging in high-risk NCD behaviours, 2015

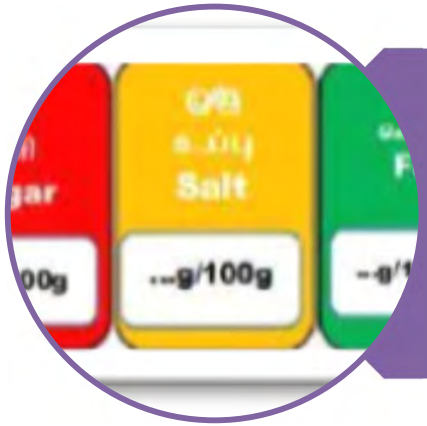


Source: World Bank, (2015), *Non-Communicable Diseases Risk Factors: STEPS Survey Sri Lanka 2015.*

Sri Lankan context: USSs

- Colombo accounts for 50% of the total urban population, with the Colombo City alone claiming 15%
- An estimated **70,000 households live in 1,735 USSs in Colombo**, accounting for over half of the city's population (Jayatissa et al., 2020)
- A recent survey conducted by the MRI shows USSs suffer from poor diet quality and affordability

Sri Lankan context: Fiscal & regulatory policies



Traffic light labeling – 2016

Tax on SSBs – 2017

Limited effectiveness due to:

- Poor coverage
- Poor awareness
- Large informal sector
- Industry lobbying

Research Objectives

1. Develop a RFE assessment tool to map & score food retail outlets in selected USSs in Sri Lanka

2. Examine how RFEs affect household diets

3. Examine COVID-19 implications on RFEs and household diets

Support the development of fiscal and regulatory policies that promote healthy RFEs & diets

Conceptual framework

Source: Turner et al., 2018

COVID-19 impacts on RFEs

External Domain

Availability: **shortages** due to panic stockpiling, reduced production and trade restrictions

Prices: risk of **food inflation**, particularly for F&V and in countries reliant on food imports

Vendor & product properties: **shortages in F&V** due to harvest and supply chain disruptions.

Marketing and regulation: **new policies restrict access to markets**, and limit purchasing of essential items

Personal Domain

Accessibility: **less access to highly nutritious, fresh produce;** School meals and other SP programs disrupted. Restricted access at physical food outlets

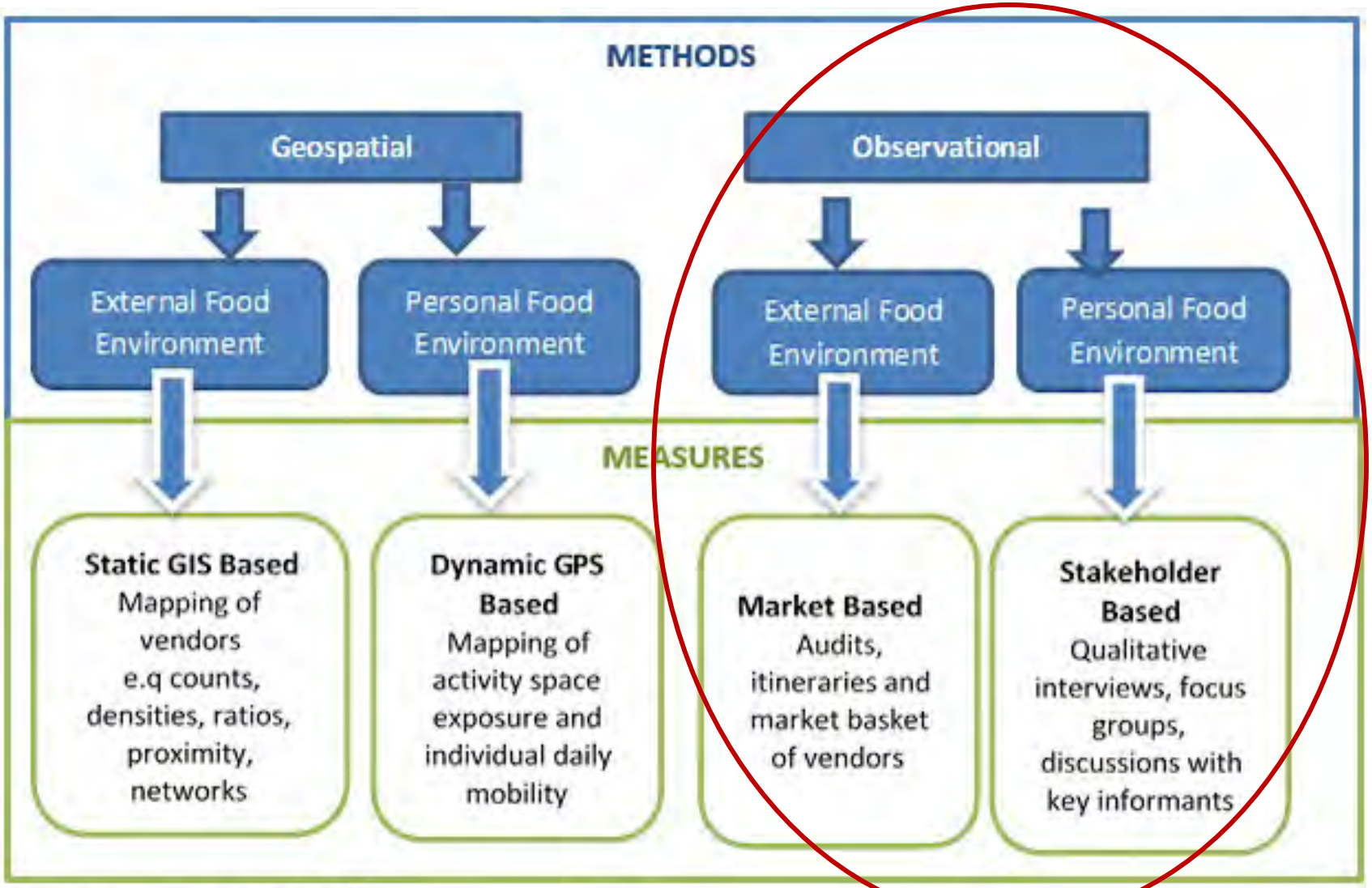
Affordability: **reduced income and earning opportunities**. Food price increases as supply falls

Convenience: **closure of food outlets** require home cooking. The demand for less healthy ready-to-eat highly processed foods increase, due to lack of time/cooking ability.

Desirability: **ultra-processed foods with a long shelf-life** become more sought after.

Source: United Nations System Standing Committee on Nutrition (2020).

Methodological framework



Source: Turner, et al. (2018).

Data and Sample

Household Survey

- 600 HHs from CMC, Dehiwala & Kolonnawa MOH areas
- Telephone survey during July-August 2021
- 1 adult male & female from each HH
- Background characteristics, food consumption/sourcing patterns, COVID-19 impacts & health status

Food Outlet Survey

- 60 outlets from same locations:
  - Retail outlets
  - Supermarkets
  - Fresh produce (F&V)
  - Fresh produce (meat & fish)
  - Restaurants/eateries
- Within an area covering a 500m radius from defined boundaries

1. Designing a RFE assessment tool

- A scoring system to classify food items and outlets based on:
  - Desk review of literature
  - Observations made at relevant locations
  - Expert opinion/validation

- Elements drawn from commonly used RFE surveys which are increasingly being used in FE research:
  - NEMS
  - INFORMAS
  - AUDITNOVA

RFE Tools

NEMS

- Developed in the US context
- Specific modules for different types of outlets
- Captures **availability, number of varieties, and prices of healthy foods**
- **Perceived nutrition environment** tool for HHs to capture **home FE, shopping & eating behaviors**

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- Framework to monitor and benchmark national FEs in a standardised way
- **12 modules** covering different aspects
- **Food retail, food prices, food promotion**
- **Density of/proximity** to healthier and less healthy food outlets/**availability and promotion** of healthy and less healthy food in-store.

INFORMAS
Benchmarking food environments

AUDITNOVA

- Based on **NOVA food categorization**
- **4 groups** based on level and purpose of food processing:
- Used in Brazil so far
- **Availability, varieties, prices, advertisements**

- Group 1 - Unprocessed or minimally processed foods
- Group 2 - Processed culinary ingredients
- Group 3 - Processed foods
- Group 4 - Ultra-processed food and drink products

Healthy vs unhealthy foods: NOVA food classification

Category	Purpose	Examples
Unprocessed/ minimally processed	Extend life via storage	Fresh/dried F&V, fresh meat/fish, eggs, pulses/lentils, leaves, roots, pulses, rice, corn, spices, non-fat/low-fat dairy products, tea and coffee, unsweetened fresh fruit beverages
Culinary ingredients	Prepare, season and cook group 1 foods	Salt, sugar, oil, butter, honey
Processed	Increase durability of group 1 foods/ modify sensory qualities.	Canned or bottled F&V, salted/sugared nuts and seeds, salted, cured, or smoked meats, canned fish, cheeses, bread
Ultra processed	Increased convenience, taste	SSBs, sweets, savoury snacks, fast-food, ready-to-eat items, cereals

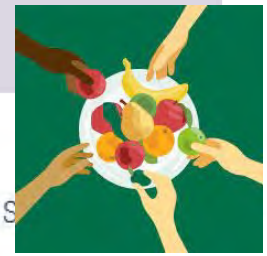
Healthy

Unhealthy

RFE score

Availability & variety

- **Base points** for each item (+3 for minimally processed & -3 for ultra processed)
- Points increase from base – by base amount – as the **range of varieties** increase



Prices

- Price list of 3-5 cheapest items
- Average differential price of NOVA **food groups**

Advertising & placement

- + (-) scores for healthy (unhealthy) items
  - **Promotional prices**
  - **Advertisements**
  - Food items at **checkout**

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		Availability	Promotional Price	Indicator total score	Price
Availability, Variety and Prices					
Healthy (fresh or mildly processed items)					
Fresh Produce	Fruits	0 items = 0 1 or 2 items = 3 3 to 5 items = 6 ≥ 6 items = 9	≥2 promotional items = 3	12	Price list of the 5 cheapest items 1Kg
	SCORE	Number of items	Number of promotional items	.....	.....- Rs..... .....- Rs..... .....- Rs..... .....- Rs.....
	Vegetables	0 items = 0 1 or 2 items = 3 4 to 7 items = 6 > 8 items = 9	≥2 promotional items = 3	12	Price list of the 5 cheapest items 1Kg

Advertising and placement strategies					
Healthy (From the list above categorized as healthy)					
	Presence of fruit and vegetables at the store entrance (Yes / No)	at least one = 1 2 or more =2	Yes =1 No = 0	2	Total score: .....
	Advertisement of healthy foods at the store entrance (Yes / No)	at least one = 1 2 or more = 2	Yes =1 No = 0	2	Total score: .....
	Advertisement of healthy foods outside the store (Yes / No)	at least one = 1 2 or more = 2	Yes =1 No = 0	2	Total score: .....
	Advertisement of healthy foods inside the store (Yes / No)	at least one = 1 2 or more = 2	Yes =1 No = 0	2	Total score: .....
	Presence of healthy food at checkout (Yes / No)	at least one = 1 2 or more = 2	Yes= -1 No = 0	2	Total score: .....
				..... (10)	

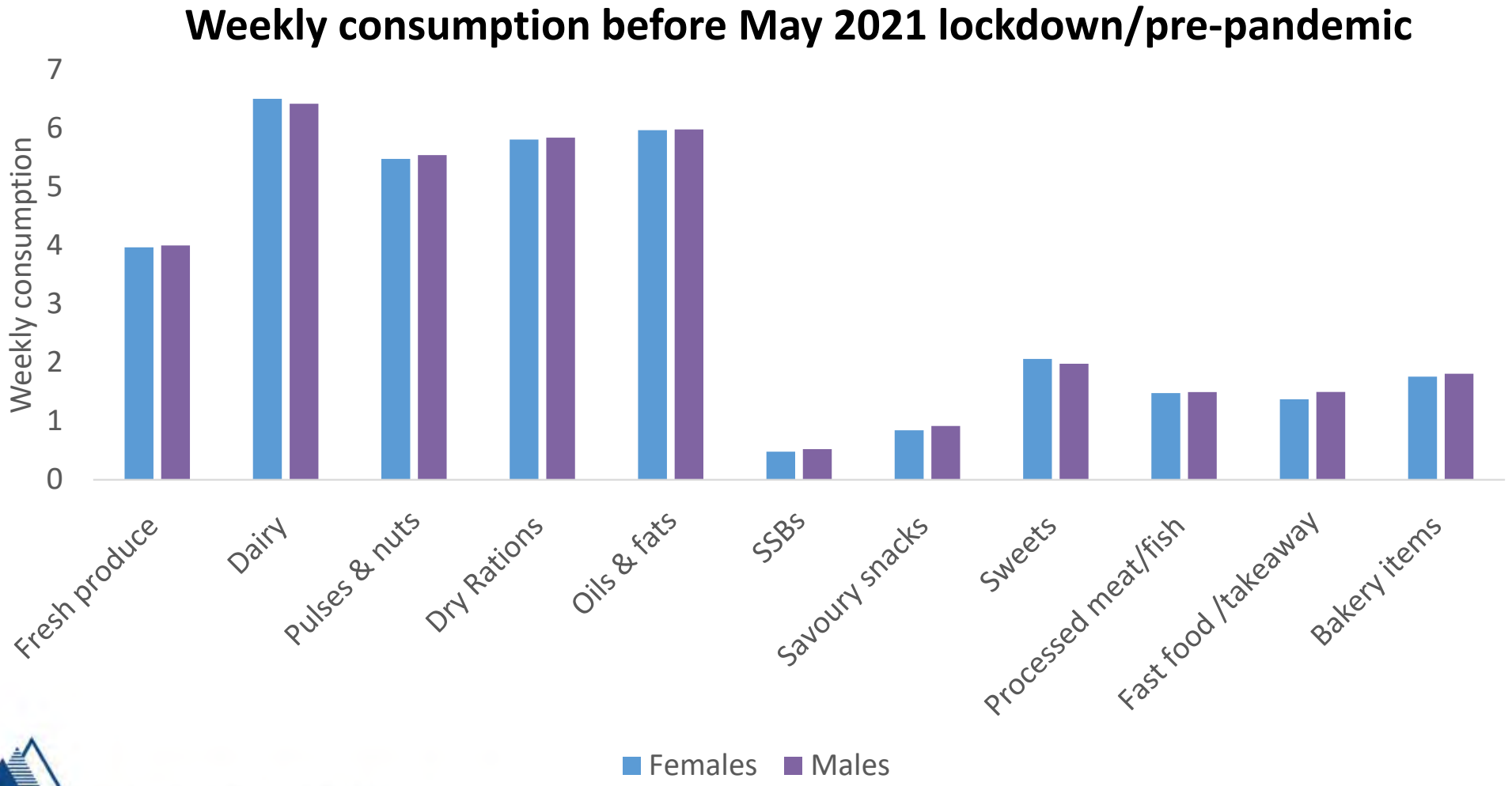
2. Factors affecting HH diets in USSs

- Descriptive analysis of diet & food purchasing patterns, health indicators
- Regression models to identify determinants of HH diets *(to be finalized)*
- Dependent variable capturing:
  - Healthy diets
  - Unhealthy diets
- Independent variables:
  - Personal RFE domain: food accessibility, affordability, and convenience
  - Socio-economic and demographic variables
  - Health indicators

Background characteristics

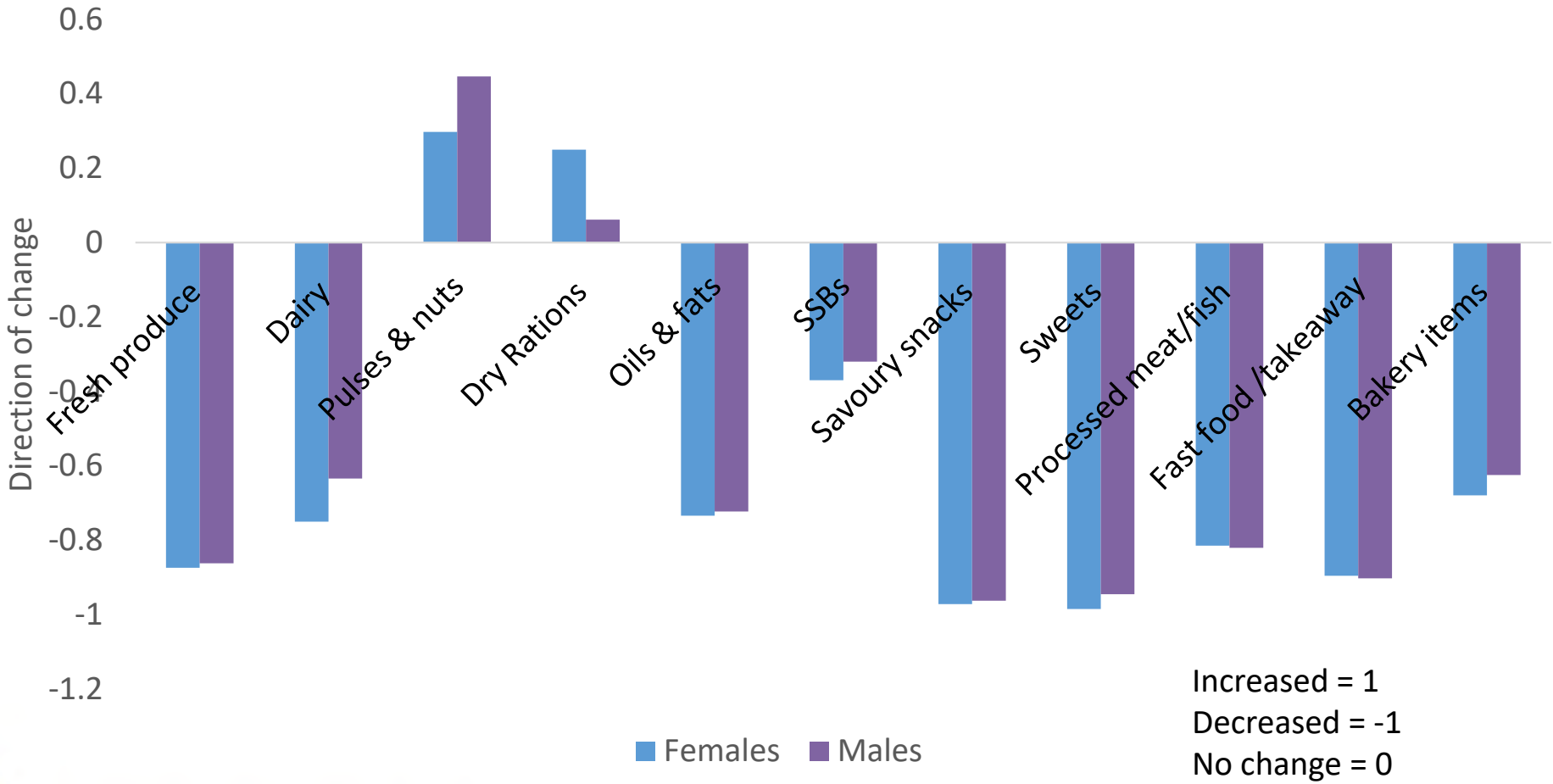
Variable	Value	
CMC	69%	
Permanent resident	76%	
HH members	4.4	
Daily wage-earners	48%	
Income: Rs 30,000-50,000	55%	
COVID-19-induced income loss	85%	
Share of food expenditure	53%	
	Males	**Females**
Occupation	Drivers, skilled & unskilled labourers – 42%	Housewife – 83%
Age	39	37
Education (secondary completed)	55%	50%

Diet Patterns



Diet patterns cont.

Diet changes during the May 2021 lockdown



Increased = 1
Decreased = -1
No change = 0

Diet patterns cont.

Factors contributing to diet changes (% of households)

Prices: **99%**

Income instability : **98%**

Accessibility : **87%**

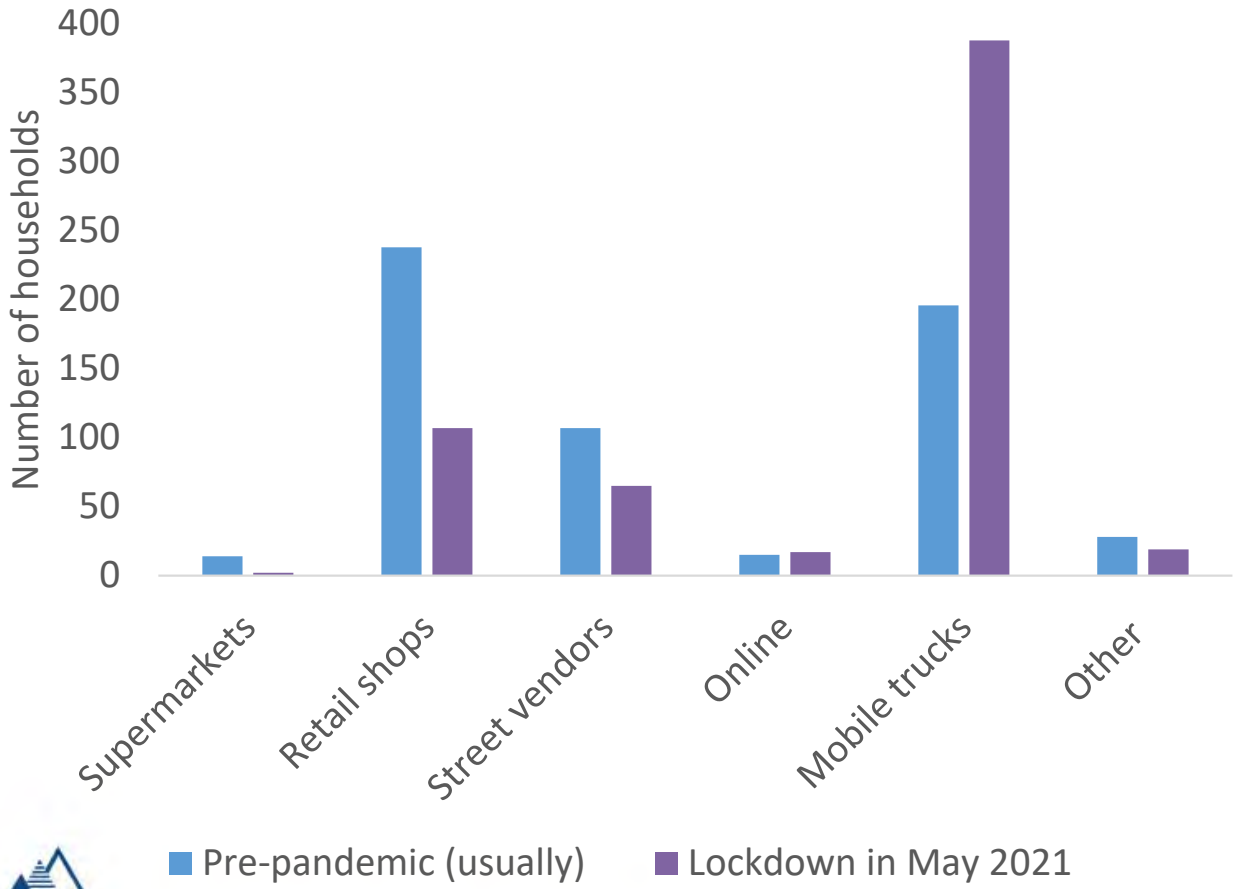
Safety/ health concerns: **53%**

Preparation: **32%**

School meal program: **5%**

Food sources

Food outlets used pre-pandemic and during lockdown

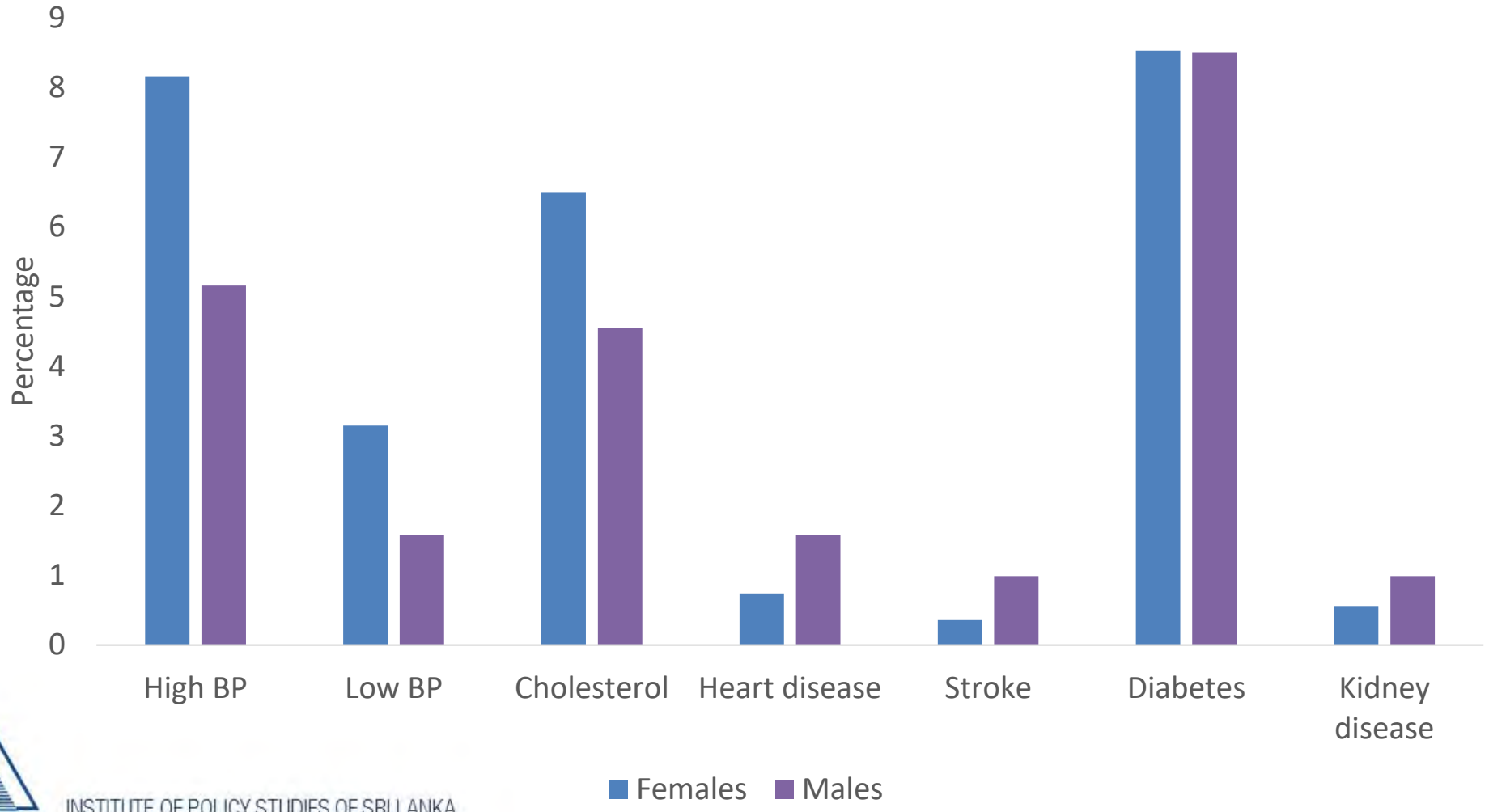


Reason for changes:

- Accessibility: **96%**
- Prices: **89%**
- Income instability: **86%**
- Preparation: **26%**

Health status

Share of adults receiving regular treatment



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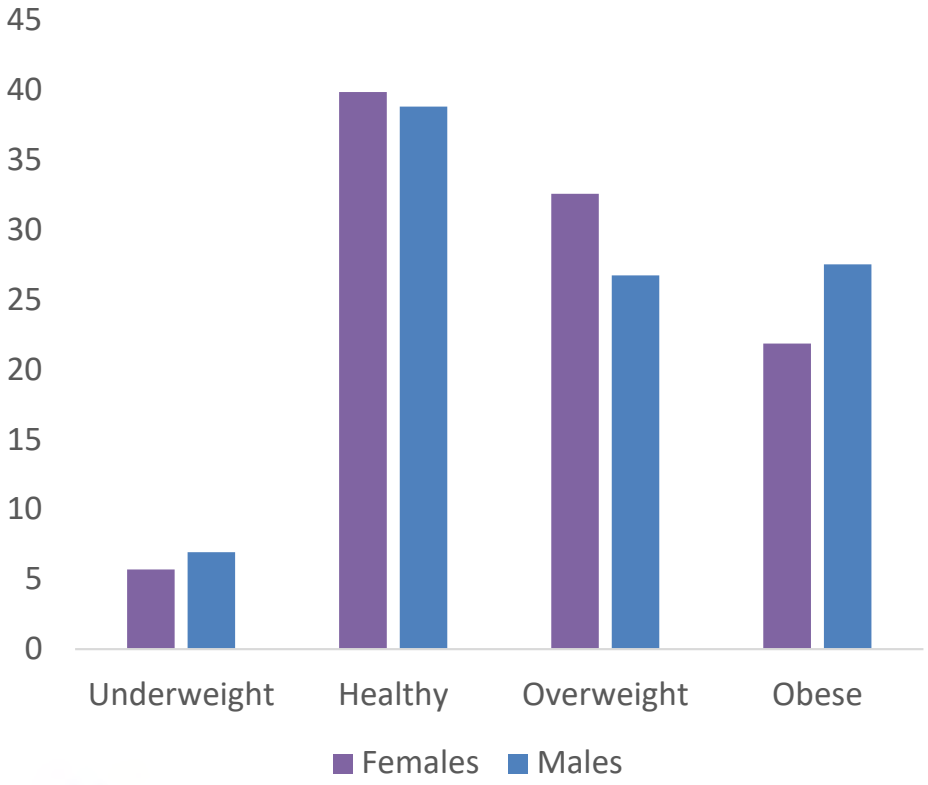
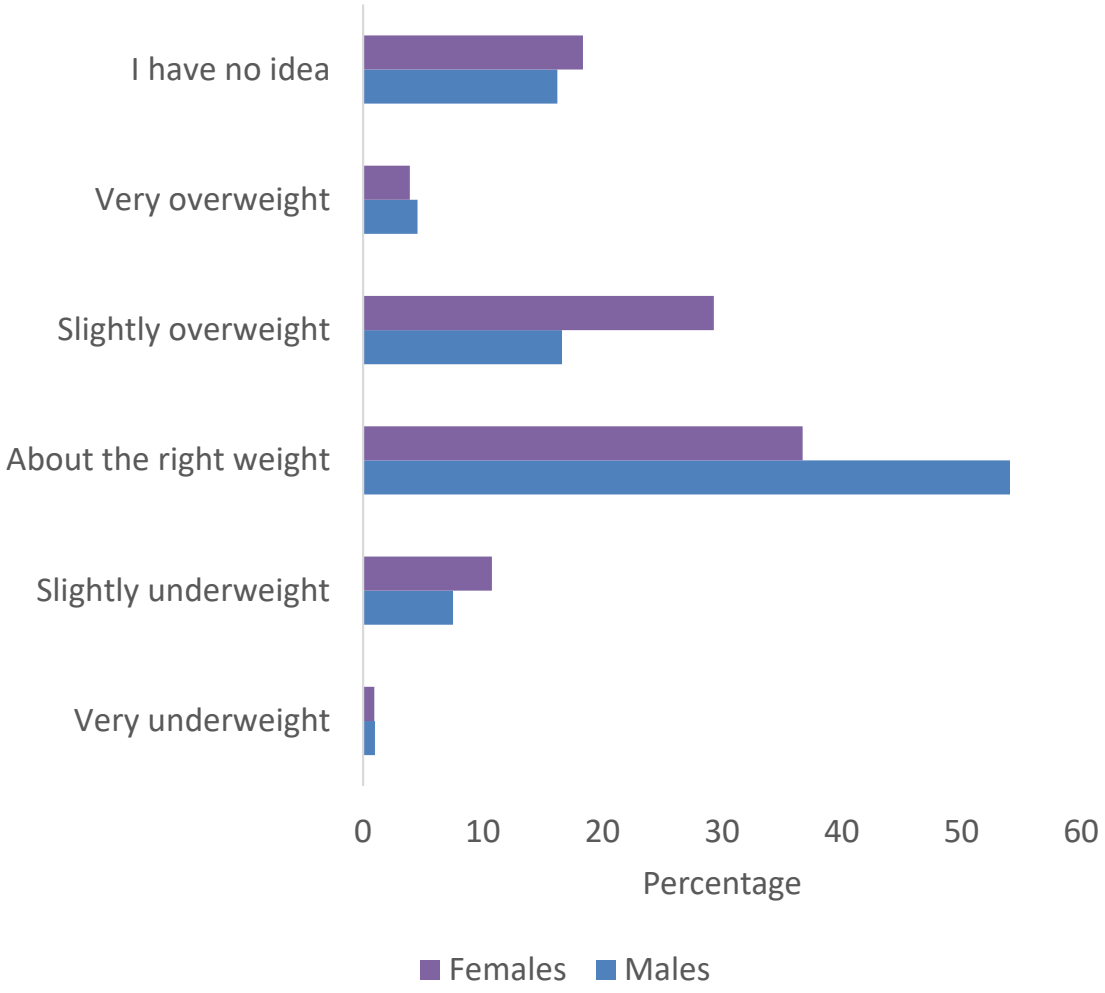
Health Status Cont.

Weight categorization based on reported BMI



Perceptions of weight



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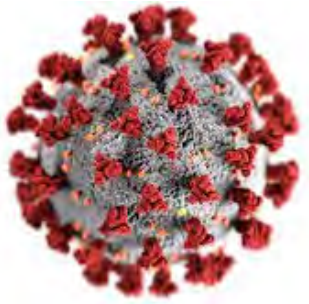
3. COVID-19 impacts: Qualitative interviews



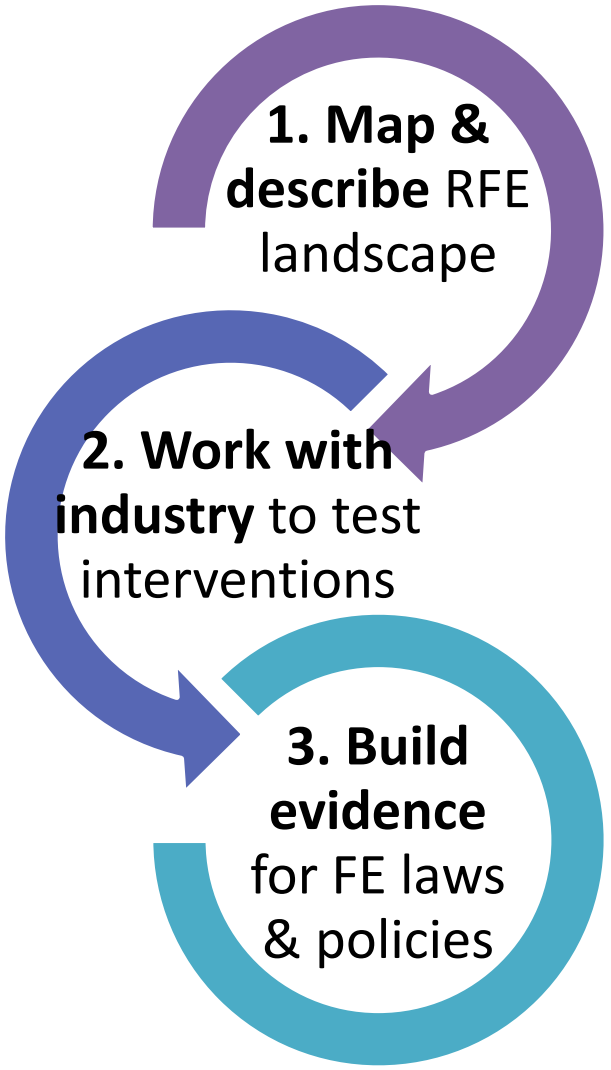
- KIIs among family caregivers from a heterogeneous group of households:
  - Randomly selected among HHs surveyed from each location
  - 24-hour dietary recall, and discussion around shopping behavior and the personal RFE (food access, affordability, convenience, and desirability)
- KIIs among a sample of food vendors:
  - Randomly selected from each location and by outlet type during food outlet survey
  - Recall of current sales and a comparison between the current and pre-pandemic environment

Preliminary conclusions

Conclusions

- Food accessibility & affordability are important factors influencing HH diets
- COVID-19 implications on diets
- Regulating RFEs remains an unaddressed area
- Partly due to lack of a comprehensive evidence base to inform policy decisions

Key targets for influencing RFEs



Next steps

Validate RFE tool & conduct RFE assessment in selected USSs

Map, describe and score RFE

Identify role of RFE and other factors affecting HH diets

Recommend fiscal and regulatory policies to promote healthier RFEs

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Regulating RFEs

- Limited policies designed to encourage healthy RFEs even globally
- Research indicates significant scope for regulatory and fiscal policies from multiple levels of government to positively influence RFEs:
- Best practice policy examples:
  - A ban on the sale and promotion of all foods high in fat, added sugar, or sodium within 50 meters from schools in India
  - A ban on the sale of SSBs and highly processed foods to children in several states in Mexico
  - Legislation introduced in the UK to ban over 100,000 unhealthy food price promotions ('buy-one-get-one-free' deals)
  - Ban on unhealthy food at checkouts in Berkeley California, requiring stores over 2,500-square feet to make available healthy food items instead.