Minutes of the Stakeholders' meeting on Front of Pack Labelling held on 15th February 2022

A meeting with stakeholders to decide remaining issues related to 'Front of Pack Labelling' was held under the Chairmanship of CEO, FSSAI on 15th February, 2022 at 03:30 PM. Members from industry associations, consumer organisations, Scientific Panel on Labelling and Claims/Advertisements and WHO participated through virtual mode. List of participants is at *Annexure-A*.

2.   CEO, FSSAI initiated the meeting with a short presentation on the journey of development of FOPL in India and the decisions taken in the last stakeholders' meeting held on 30.06.2021 under the then Chairperson, FSSAI. He informed the stakeholders that, based on the decisions taken in the said meeting, the Scientific Panel undertook the task of review of food categories and thresholds for FOPL and secondly, a national level survey was commissioned through IIM, Ahmedabad to analyze major FOPL models that are available across the globe with the objective to identify an FOPL which is easy to understand and also induces behavioral change of Indian consumers. Thereafter, Advisor (Science and Standards) presented the global scenario of FOPL including WHO Models, thresholds/basis for various models implemented in different countries and recommendations of the Scientific Panel. He informed that the Scientific Panel has recommended thresholds for two categories, i.e. Food and Beverages, based on the prevalent global models for ease of implementation. He further presented the thresholds recommended by the Panel, which inter-alia includes thresholds for positive nutrients also, in case of summary ratings. The recommendations of the Panel are at *Annexure-B*.

3.   Following this, representatives from IIM, Ahmedabad and Dexter Consultancy Pvt. Ltd. made a detailed presentation on the findings of the survey. The presentation included literature review on FOPL, study design, sampling criteria and findings/analysis of the data sets. A randomized controlled trial (RCT) was carried out on a nationally representative sample of 20,564 respondents covering all major states of India who were randomized to one of the six groups, i.e. No FOPL, Health Star Rating, Nutriscore, Warning label, Multiple traffic lights and Monochrome GDA. 62% of the respondents were contacted physically and 38% through video calls on face-to-face interactions. The quality controls undertaken throughout the survey to ensure robustness of the data were also mentioned. The preference of FOPL models amongst respondents in terms of age, occupation, label-reading behavior and knowledge on morbidities of the respondents were also presented. Based on the analysis of the data, IIM A recommended HSR over other models for achieving a careful combination of the dual objectives of ease of identification and understanding; and change of purchase behavior of Indian consumers. The presentation was followed by an interactive session in which IIM A faculty addressed queries raised by the participants. The presentation made by IIM A is at *Annexure C*.

4.   After detailed deliberations on the following three major issues, decisions were taken as under:

a)   **Thresholds and Number of categories**:

With respect to the thresholds, nearly all stakeholders sought additional time for comments as they intended to analyze the effect of these thresholds after subsuming of sub-category wise thresholds. They further added that different thresholds may be required for dairy products in specific, considering the nature of these products. The representatives from consumer organizations as well as WHO stated that the levels are quite high in comparison with the earlier draft notification.

It was decided to share the recommendations of the Scientific Panel with the stakeholders who may provide their comments on the same to FSSAI by 02nd March, 2022, which will be further examined by the Panel. With respect to the comment regarding high level of thresholds, it was clarified that the proposed levels are in alignment with models implemented in other countries and WHO Population Nutrient Intake Goals recommendations. Considering that the country is embarking on FOPL for the first time, thresholds may be initially fixed as proposed and reviewed later based upon experience over the initial years of implementation. With respect to setting thresholds for dairy category separately, the Chair informed that majority of dairy products are proposed to be exempted from the declaration of FOPL, as they were in the earlier FSSAI draft notified in 2019. Nonetheless, he advised the industry to provide collated comments and globally available data for this or any other category for consideration by the Panel.

Decision(s): The presentation regarding recommendations of the Scientific Panel shall be shared with stakeholders, who may then like to submit their comments by 02nd March, 2022. The Scientific Panel may consider creation of additional categories for dairy or any other products, besides 'Food' and 'Beverages'. The Panel would also consider submissions made regarding the proposed thresholds.

b) **Type/Format of FOP Label:** HSR has come out as the recommended FOPL format for Indian consumers based on the IIM-A's survey report. The stakeholders requested for sharing the IIM report for a detailed assessment. IIM, Ahmedabad agreed to share the power point presentation made by them and informed that the report will be shared after finalization.

Mr. George Cheriyan from CUTS International and Mr. Amit Khurana, CSE opposed the recommendation for use of HSR Model in India due to the reasons that health star ratings are taken with a positive connotation and do not meet the intention of FOPL regarding warning for negative nutrients, which may be overwhelmed by positive nutrients in the algorithm design for HSR. Mr. Ashim Sanyal, Consumer Voice also informed that AIIMS-UNC is also carrying out a study on the FOPL, the report of which is also expected shortly. It was suggested that FSSAI may also await the findings of AIIMS report, in order to take any further decision on the format.

The industry associations appreciated the study conducted by IIM Ahmedabad and expressed willingness to go along with their recommendations, as was decided in the meeting dated 30.06.2021.

Some participants raised a point that the HSR format used in IIM A study did not have the nutrient specific information portion and was a modified version of HSR. It was clarified that as per the official document on HSR, FBOs are encouraged to provide nutrient specific information but it is not mandatory to do so. HSR was taken as a summary assessment FOPL in the study as against nutrient specific models such as Warning Labels and Multiple Traffic Lights. Moreover, per serve percentage contribution of nutrients as a percentage of RDA would be available on the back of the pack label from July, 2022, as provided in the FSS (Labelling and Display) Regulations, 2020.

It was pointed out that in the meeting on 30th June, 2021 it had been decided that a reputed institution like IIMs may be engaged to carry out a study of FOPL formats to identify ease of understanding and behavioural change of Indian consumers on a national level. All stakeholders had unanimously agreed to go along with the recommendations arrived at in such a study. Minutes had been circulated accordingly and no dissenting note had been received. In view of this, the recommendation made by IIM Ahmedabad after a detailed survey should be accepted. However, Mr. George Cherian, Mr. Amit Khurana, and later on Mrs S Saroja, ED CAG through email expressed their disagreement with HSR system, which was duly noted.

Decision(s): It was decided that the study conducted by IIM, Ahmedabad has the advantage of a large representative sample size and robust data. It would not be proper to discard the preference of more than 20,000 representative Indian consumers ascertained through a direct survey on the basis of the opinion of consumer organizations or industry associations. HSR may be incorporated in the draft regulations and the stakeholders may provide their comments on the same as per due procedure.

c) **Time period for transition from Voluntary to Mandatory**: The Scientific Panel recommended voluntary implementation from 2023 and a transition period of 4 years for making the FOPL mandatory.

The Consumer organizations opined that the FOPL should be made mandatory right from the inception considering the rising status of NCDs in the country. Representative from WHO also made a similar point and suggested that at the most three years may be given for such transition. The industry associations suggested phased approach to move from voluntary to mandatory declaration of FOPL.

Decision(s): Based on the deliberations, it was decided that an initial period of four years, as recommended by the Scientific Panel, may be proposed for voluntary implementation of FOPL and the same may be incorporated in the draft regulations. The stakeholders may provide their comments on the same as per the due procedure.

The meeting ended with a vote of thanks to the Chair.

List of Participants:

1. Ms. Varsha Yadav, FICCI
2. Ms Meetu Kapur, Executive Director, CII
3. Mr Kajal Debnath, DFM Foods Ltd.
4. Ms Mili Bhattacharya, Coca Cola
5. Mr. Vijay Gaur, Head Regulatory Affairs, Danone India
6. Dr Richa Pritwani, Dabur
7. Dr Sangeeta Chadha, HUL
8. Mr. Krishna Kumar Joshi, ITC Ltd
9. Ms. Parna Das Gupta, Director Regulatory and Government Affairs-South Asia-Kelloggs
10. Mr. Zafar Khan, Mondelez India
11. Ms Mani Mishra, Mother Diary
12. Ms. Shreya Pandey, PepsiCo Holding Pvt Ltd. AIFPA
13. Dr. Anirudha Chhonkar, Head Regulatory Advocacy, Nestle India Ltd.
14. Mr. Vikas Jain, PMV Nutrients
15. Dr. Neelu Khurana, DGM-QA, Haldirams

17. Mr. Shaminder Singh, Pepsico.
18. Mr. George Cheriyan, Director, CUTS International.
19. Prof. Bejon Kumar Misra, Founder, Healthy You Foundation
20. Ms. Saroja Iyer, Executive Director, Citizen Consumer and Civic Action Group, Chennai
21. Mr. Ashim Sanyal, CEO, Consumer Voice
22. Mr. Amit Khurana, Director, CSE
23. Dr. Rachita Gupta, WHO
24. Prof. Arvind Sahay, IIM Ahmedabad
25. Prof. Ranjan Ghosh, IIM Ahmedabad
26. Mr. Rahul Ajay Sanghvi, Dexter Consultancy Pvt. Ltd,

Ministry of Health and Family Welfare
1. Sh. Ashish V. Gawai, Director

FSSAI Officials:

1. Sh. Arun Sinhgal, CEO, FSSAI- in the Chair
2. Ms. Inoshi Sharma, Executive Director (CS)
3. Dr. N. Bhaskar, Advisor (Science and Standards)
4. Shri Vikas Talwar, Deputy Director (RCD)
5. Shri P. Karthikeyan, Joint Director (Regulations/Codex)
6. Ms. Kriti Chugh, AD (RCD)
7. Mr. Balaji, TO (RCD)
8. Ms. Manpreet Kour, TO (Standards)
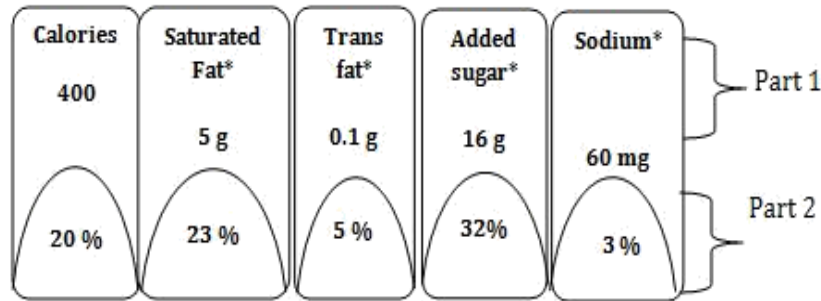9. Ms. Hiya Pandey, TO (Standards)

Expert Members:

1. Dr K. Madhavan Nair, Scientist-E (Rtd.), Micronutrient Research Group Department of Biophysics, National Institute of Nutrition (ICMR), Hyderabad.
2. Dr Asna Urooj, Professor, Department of Studies in Food Science and Nutrition, Manasagangotri, University of Mysuru, Mysuru.
3. Dr Bhavesh Modi, Associate Professor, GMERS Medical College, Civil Hospital, Gandhinagar.
4. Dr Jagmeet Madan, National President, Indian Dietetic Association, Principal, Professor, Sir Vithaldas Thackersey College of Home Science, Bandra, West Mumbai.
5. Dr Nachiket Kotvallle, Principal Scientist, Head, Agro Produce Processing Division, ICAR-CIAE, Bhopal.
6. Dr Seema Puri, Associate Professor, Dept. of Nutrition, Institute of Home Economics (University of Delhi), New Delhi.
7. Dr Subba Rao M Gavaravarapu, Scientist E, ICMR- National Institute of Nutrition, Hyderabad.
8. Dr Sumit Arora, Principal Scientist, Dairy Chemistry Division National Dairy Research Institute (NDRI), (Deemed-to-be University), Karnal.
9. Dr Sunita Chandorkar, Asst Professor, Dept of Foods and Nutrition, Faculty of Family and Community Sciences, The MS University of Baroda, Vadodara.
10. Ms Anuja Agarwala, Dietician, Department of Paediatrics, 3rd Floor, Academic Block (main), All India Institute of Medical Sciences (AIIMS), Ansari Nagar, New Delhi.

Front of Pack Labelling (FOPL)

Journey so far….

WHO guiding Principles of FoPL

➢ No CODEX guidelines yet.

➢ *Aims of FOPL* : to provide easily understood information, assist customers make healthier choices. Additional – stimulate favourable compositional changes.

❑ *Step 1: Contextual analysis,*

❑ *Step 2: Confirm aims, scope and principles*

❑ *Step 3: Government led stakeholder engagement process*

❑ *Step 4: Select FOPL format.*

➢ Prudent to undertake consumer testing to ensure suitability.

➤ Mandatory declaration of Total Energy (TE), Sat Fat, Trans Fat, Added Sugar & Sodium with their % contribution to RDA on the front of the pack

Note: Calculated based on reference daily energy intake value of 2000 kcal;
*: Excessive intake of these ingredients through any food can be harmful to health.

Part 1 : Amounts of nutrients above per serve
Part 2 : Per serve percentage (%) contribution to RDA*

To be calculated on the basis of 2000 kcal energy, 22g saturated fat, 2 g trans fat, 50 g added sugar and 2000mg sodium requirement for average adult per day

➤ Specified thresholds for added sugar (NMT 10% of TE), Trans Fat (NMT 1% of TE), Sat. Fat & Sodium content (Category wise distinct values)

➤ Particular block under Part 2 to be colored **RED**, if the nutrient exceeds specified threshold

➤ No depiction of block for the above nutrient(s), if the nutrient is absent in the product

The Journey of FoPL in India (2020 – 2022)

Concerns raised by stakeholders w.r.t. practicability and implementation of draft FSS Regulations on FOPL.

A study was commissioned through M/s The Nutrition Alchemy to assess the current Indian market scenario.

A new Working Group constituted under Dr. Madhavan Nair to review the threshold values and study conducted by M/s The Nutrition Alchemy.

A Consultative Group consisting of industry and consumer organizations set up to work towards a consensus. Six meetings were held.

Decisions taken during the Meeting held with stakeholders on 30.06.2021 under Chairperson, FSSAI

- Consensus on declaration of Energy (kcal), Sodium (maybe as salt), Total Sugars, Saturated Fat on FoPL in 100g/ml of the product.
- Positive nutrients to be considered, only if summary rating model is chosen.
- No changes in exemptions were discussed.
- Scientific Panel to review categories and thresholds. Have few categories only.
- Survey by a reputed institution like IIMs to identify best FOPL format for ease of understanding and behavioral change. All stakeholders to go along with recommendations.

Action Taken by FSSAI

- FSSAI commissioned a study through IIM, Ahmedabad with about 20,000 participants.
- Scientific Panel on Labelling and Advertisement/Claims reviewed the proposed categories and thresholds for revised categories.

Status & Panel's Recommendations

➢ FSSAI used WHO-SEARO model for proposing nutrient thresholds

➢ SEARO Model provided ***18 Food categories*** with ***25 different thresholds*** covering ***around 115 subcategories***

➢ FSSAI, while adopting, harmonized with Indian Food Category system vis-à-vis Codex categories

➢ FSSAI draft had ***16 Food categories*** with ***29 different thresholds*** covering ***about 115 subcategories***

- The WHO PNIG represent the population *average intake* that is judged to be consistent with the *maintenance of health in a population*

- Provides *numerical recommendations* that help prevent obesity & related NCDs along with sugar and salt guidelines

- *Do not provide increase or decrease in intakes* of specific nutrients - desirable change depends on existing intakes & can be in either direction

- A food product is *classified as "excessive"* in one or more critical nutrients *if the existing intake is higher* than the maximum level recommended

- Eating at least *400g of F&V per day reduces the risk* of NCDs and ensure an adequate intake of dietary fibre

Ranges of population nutrient intake goals	
Dietary Factors	Goal (% T Energy)
Total Fat	15-30
Saturated fatty acids	<10
Polyunsaturated fatty acids	6-10
n-6 PUFAs	1-2
Trans fatty acids	<1
MUFA	By difference
Total carbohydrate	55-75
Free Sugars	<10
Protein	10-15
Sodium (Sodium Chloride)	<2 g/d (<5 g/d)
Fruits and Vegetables	≥400 g/d
Total dietary fibre	From foods
Non-starch polysaccharides	From foods

WHO Nutrient Profile Models – a comparison

Model	EURO	PAHO	SEARO	AFRO
Basis	Danish & Norway models	PNIG (2000 Kcal)	PNIG (2000 Kcal)	PNIG (2000 Kcal)
Categories	17 (4 subcategories)	Not category specific	18 (10 subcategories)	18 (10 subcategories)
Nutrients of concern	No uniform criteria for nutrients across categories	Free sugars, sodium, saturated fat, total fat, trans fat* & other sweeteners**	Total fat, saturated fat, total sugars, added sugars and sodium	Total fat, saturated fat, total sugars, added sugars and sodium
Criteria for declaring "*excessive*" nutrient	NA	≥ 1 mg of sodium per Kcal ≥ 10% TE from FS ≥ 30% of TE from TF ≥ 10% of TE from Sat Fat * : ≥1% of TE ** : Any amount	≥ 1 mg of sodium per Kcal ≥ 10% TE from FS ≥ 30% of TE from TF ≥10% of TE from Sat Fat	≥ 1 mg of sodium per Kcal ≥ 10% TE from FS ≥ 30% of TE from TF ≥ 10% of TE from Sat Fat
Year Published	2015	2016	2017	2019
Remarks	TE : Total energy; TF : Total fat; FS : Free Sugar; Sat Fat : Saturated Fat; FS in case of SEARO/PAHO as defined in PNIG			

Implemented FOPL models – a comparison

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Model	HSR	Nutri Score	MTL	Chile	Israel
Basis	Australian Dietary Guidelines based Scoring Algorithm	Nutrient Profiling System – developed by survey of market products in par with British dietary guideline	EU Regulation No. 1169/2011 on the provision of food information to consumers (EU FIC)	Nutrient profiling scheme basis Chilean diet in reference to Nutrient reference values (NRV) & Chilean Food sanitary Regulations	Adaptation of Chilean nutritional labeling regulation
Alignment with PNIG (Yes/No)	Alignment with energy	Aligned for Energy,TF,SF	Aligned for Energy,TF,SF	Yes (except Total sugar)	Yes (except Total sugar)
Nutrients of concern	Energy, total sugar, saturated fat & sodium **(Risk Nutrients)** Protein, dietary fibre & fvnl [fruit, vegetable, nut or legume] **(+ve Nutrients)**	Fruits, Vegetable & nuts, Fiber and Protein ($+^{ve}$ Nutrients) **["P" Points]** Energy, Total Sugars, Saturated Fatty Acids and Sodium ($-^{ve}$ Nutrients) **["N" points]**	Energy, Fat, Saturated fat, Sugars & Salt	Energy, Sodium, Total sugars, Saturated Fats	Sodium, Total Sugars, Saturated Fats

Implemented FOPL models – a comparison

Model	HSR	Nutri Score	MTL	Chile	Israel
Nutrient Specific/ Summary Assessment	Summary Assessment	Summary Assessment	Nutrient Specific	Nutrient Specific	Nutrient Specific
Scoring system	Points & scores vary across categories	Difference of P & N points (P b/n 0 & 15; N b/n 0 & 40)	Colour coding (G/A/R) & Warning (L/M/H)	Warning – Monochromatic **(Black)**	Warning – Monochromatic (Red)
Year implemented	2014 Voluntary	2017 Voluntary	2013 Voluntary	2016 Mandatory	2020 Mandatory **Green Label*-** Voluntary
Reference Size	100 g in case of Food or 100 ml in case of liquids/beverages/drinks MTL in addition also has a portion size criteria; To be used if portion/serving size exceeds 100g (food) or 150 ml (drinks)				

Green Label* – *prominent symbol on the front of packages or on the shelf signage of unpackaged foods, whose composition is consistent with the national nutrition recommendations of the Ministry of Health for a healthy population*.

Nutrient Reference Values of countries– a comparison

	Aus-NZ (HSR)	France (Nutri Score)	UK (MTL)	Chile (Monochrome)	Israel (Monochrome)	India (Monochrome)
Energy	~2080 Kcal	~2010 Kcal	~2010 Kcal	2000 Kcal	-----	2000 Kcal
Total fat	70g	70g	70g	-----	-----	67g
Sat fat	24g	20g	20g	22g	22g	22g
Total Sugar	90g	90g	90g	90g	90g	50g (added sugar)
Sodium	2300 mg	~2400mg	~2400mg	2000mg	2000 mg	2000 mg

(1) NRVs of countries with implemented FOPL are almost similar

(2) Nutrient profiling/scoring system are developed basis their dietary guidelines/surveys or market studies

Thresholds for solids (100gm) – a comparison

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	Aus-NZ		France (NutriScore)	UK (MTL)	Chile $ (Monochrome)	Israel (Monochrome)
	2 & 2D	3D				
Energy	~ 400 Kcal	~400 Kcal	~400 Kcal	----	350 Kcal	-----
Total fat	-----	-----	-----	17.5g	-----	-----
Sat fat	5 g	5 g	5 g	5 g	6 g	4 g
Total Sugar	20.7 g	22.5 g	22.5 g	22.5 g	22.5 g	10 g
Sodium	450 mg	450 mg	450mg	600mg	800mg	400mg
Fruit & Vegetable	25%/ 40 %* 63% / 75%**		60%#	----	----	----
Fibre	0.9* / 11.6** g	0.9* / 11.6** g	2.1 g	----	----	---
Protein	1.6* / 6.3** g	1.6* / 6.3** g	4.8 g	----	----	---

* : In case of product solely containing concentrated F&V or non-concentrated contents of F&V, a score of "0" is given if the minimum is 25 or 40%, respectively; ** : the threshold respectively is 63 or 75%, at the middle of the scoring (i.e., 4)

: A product with minimum 40% F&V in concentrated form will get "0" points, while a threshold of 60% or above gets 4 points

$: Starting levels

Thresholds for liquids(100ml) – a comparison

	Aus-NZ			France (NutriScore)	UK (MTL)	Chile $ (Monochrome)	Israel (Monochrome)
	1	1D	3				
Energy	~30 KCal	~400 Kcal	~400 Kcal	~36 Kcal	----	100 Kcal	-----
Total fat	-----	-----	-----	-----	8.75 g	----	-----
Sat fat	-----	5g	5 g	5 g	2.5 g	3 g	3g
Total Sugar	6.1	20.7g	22.5 g	7.5g	11.25g	6 g	5g
Sodium	-----	450mg	450 mg	450 mg	300 mg	100 mg	300mg
Fruit & Vegetable	57%	25 or 40 %* 63 or 75%**		40# 60##	----	----	----
Fibre	NE	NE	0.9/11.6 g	2.1g	----	----	----
Protein	NE	1.6g/6.3g	1.6g/6.3g	4.8g	----	----	----

* : In case of product solely containing concentrated F&V or non-concentrated contents of F&V, a score of "0" is given if the minimum is 25 or 40%, respectively; ** : the threshold respectively is 63 or 75%, at the middle of the scoring (i.e., 4)

\# : A product with minimum 40% F&V in concentrated form will get "0" points, while a threshold of 60% or above gets 4 points

$: Starting Levels

Recommendation by the Scientific Panel

✓ TWO categories for FoPL purpose - Solids and Liquids (beverages)

✓ Thresholds (per 100g or 100 ml, as the case may be) suggested by the panel considering WHO's PNIG recommendation, global FoPL (implemented) models and Indian context

Nutrient thresholds			Additional for Summary Assessments	
Nutrient	**Food, 100 g**	**Beverages, 100 ml**	**Positive Nutrient**	**Minimum, %**
Energy, kcal	400	100	FV	10
Total Sugars, g	20.7	6	NLM	10
Saturated fat, g	5	3	Fibre	8
Sodium, mg	450	100	Protein	8

FV : Fruits & Vegetables; NLM : Nuts, legumes & millets

✓ The above values will be used for suggesting phase-wise reduction over a period of 5 years (starting 2023)

✓ To come into effect on voluntary basis *starting mid 2023*, to become *mandatory in mid 2027*

✓ FBOs may be given an option to choose to implement the final phase in 2023 or arrive at it by 2027

Thank you for Wearing a

& getting for they keep You & others safe

Consumer preferences for different nutrition front-of-pack labels in India

Findings from a Large Scale Randomized Controlled Trial | February 15, 2022

Structure of Presentation

- **The Research Question**

- International Experience with FOPLs

- Study Design and Sampling

- Data Collection and Dataset

- Analysis and Results

- Recommendation

The Research Question

Which FOPL is , simple, easy to recognize and to understand?

Which FOPL has a a greater impact on customer behavior in terms of purchase intention?

Structure of Presentation

- The Research Question
- **International Experience with FOPLs**
- Study Design and Sampling
- Data Collection and Dataset
- Analysis and Results
- Recommendation

International Experiences with FOPLs: Overview

- Placing nutrition facts on front of the packages are more effective than when they are placed at the back and that FOPLs help guide healthier product choices (Watson et al. 2014; Mhurchu, 2017; Jones et al. 2019; Temple, 2020; Shahrabani, 2021)

- A study in the UK with 4504 respondents found that all FOPLs were effective at improving participants' ability to correctly rank products according to healthiness with the largest effects seen for Nutriscore, followed by MTL (Packer et al., 2021)

- Detailed systematic reviews are available in Campos et al. (2011), Temple (2020) and Jones et al. (2019). Argentina, Australia, Bulgaria, Canada, Denmark, France, Germany, Mexico, Singapore, Spain, the UK, USA

International Experiences with FOPLs: Europe

- Voluntary use of five types of FOPLs in France found that aggregate, color-coded labels such as Nutri-Score brought in significant nutritional effects. Aggregating scores on ratings across various FOPLs on its features, functions and effects, showed that simple and aggregate labels would perform better than detailed and analytical ones (Crosetto et al. 2020)

- Study of 500 products in the UK market across the major categories of cereals, dairy, beverages, packages meats and packaged fruits and vegetables showed that MTL and GDA were the most used where MTL (and reference intakes) comprised 43.8% of the total labels whereas the share of GDA (and reference intakes labels) were 19.6% (Ogundijo et al. 2021)

International Experiences with FOPLs: Latin America

- Variability of FOPL understanding among low- and middle income residents of Mexico City.
  - Although 80% of the participants were aware of GDA FOPL, only 33% among them actually understood or used them.
  - The 5-color Nutrition Label was the least favored, whereas directive labels such as warning label, health star rating and multiple traffic lights fared better than non-directive labels such as GDA or Nutriscore. (Vargas-Meza et al. 2019)
- In light of these and very encouraging results from implementation of Warning Label FOPL in fellow Latin American country Chile, the Mexican Congress voted to approve Warning Label FOPL as the mandatory label under an updated NOM-51 from March, 2020.

International Experiences with FOPLs: Others

- The Israeli government mandated the use of a Red Warning FOPL. 58.5% of surveyed respondents used the FOPLs whereas 41.5% did not heed value to the Warning FOPLs; 70% were willing to change their food consumption habits (Shahrabani, 2021)

- New Zealand and Australia endorsed HSR system as the voluntary FOPL scheme in 2014; 5.3% of the total packaged products had adopted the use of FOPLs in NZ, 27.6% in Australia with a mean HSR of 3.4 stars (Mhurchu et al. 2017, Jones et al. 2018); Small improvements observed in the use of heathy and unhealthy ingredients in the products

Structure of Presentation

- The Research Question
- International Experience with FOPLs
- **Study Design and Sampling**
- Data Collection and Dataset
- Analysis and Results
- Recommendation

Randomized Controlled Trials (RCTs)

- RCT is based on the premise that the sample of interest is randomly divided into groups with one group being the "control group" that does not have the stimuli (treatment) and the others groups have a particular treatment.
- Any difference in choices that respondents make can only be ascribed to the treatment (stimuli) as random allocation of subjects into different groups ensures that all other possible influences are same (Kendall, 2003)
- Considered to be one of the most rigorous methods of determining whether a cause-effect relation exists (Sibbald and Roland, 1998)
- The 2019nNobel Prize in Economics was awarded for pioneering this technique to Abhijit Banerjee, Esther Duflo and Michael Kremer

RCTs: Advantages

- RCT design helps minimize several important biases such as selection, observer, participant, response or attentional - where group assignment is blinded, response to one stimuli is not impacted due to presence of another stimuli as a single participant receives only one of them

- Minimizes confounding factors and chance errors that amplify effects of the stimuli of interest (Kendall, 2003) - RCT is based on prospective design, it minimizes recall errors (Satija et al., 2015) and helps focus the analysis on the original research question rather than data 'trawling' (Michels and Rosner, 1996)

Design

- A randomized controlled trial (RCT) is used on a nationally representative sample of 20,564 face–to–face survey respondents covering all major states of India who were randomized to one of the six groups:

No FOPL
Health Star Rating
Nutriscore
Warning label
Multiple traffic lights
Monochrome GDA

- To avoid too much complexity, we have not tested for hybrid formats or for colour variations within summary indicators

Treatment and Control

- For each of the 5 label types, 3 variants were taken as stimuli, thus making a total of 15 treatment groups

- For each of the 15 treatment groups, cells of 400 samples each with a healthy, an unhealthy and no prime

- Thus, a total of 15 X 3 X 400 = 18,000 samples in treatment groups
- 3 control groups of 800 samples each with a healthy, unhealthy and no prime

- Thus, a total of 20,400 samples were to be collected

Features

- Randomization was done using a computerized system making an equal probability of assignment of subjects per treatment

- The sampling frame was weighted by the relative consumption of an item in a particular geography.

Features

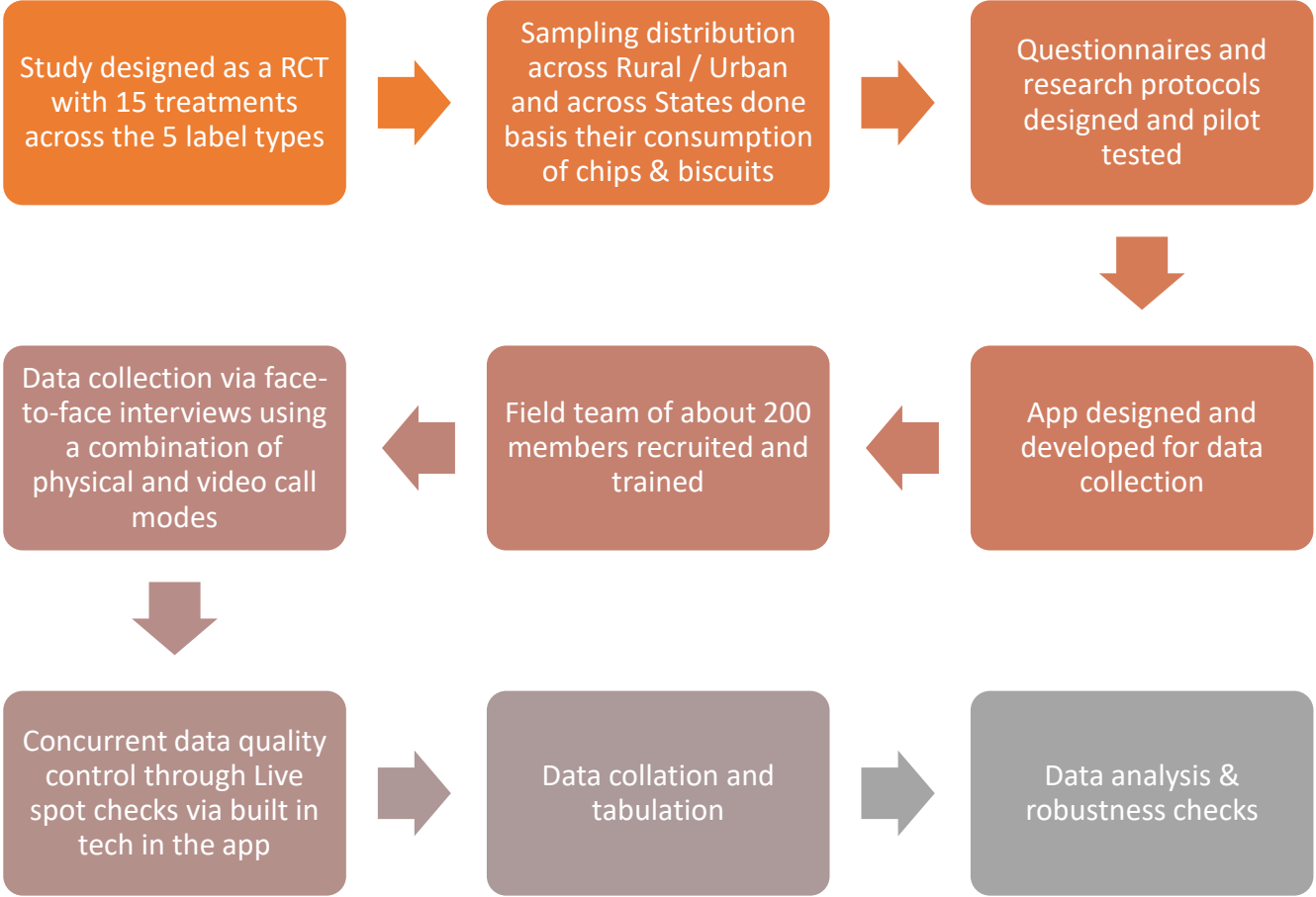- The respondents were randomly allocated to 15 treatment groups and asked their purchase intention for packaged biscuits and chips

- The control group did not have an FOPL whereas the treatment groups had one of the five FOPL.

- In addition, each category had two primes: a healthy and an unhealthy. The purpose was to judge the relative effectiveness of the different FOPLs as a signage for "healthy" and "unhealthy" foods.

Covariates

- After the choices are made, participants were asked to self-report on socio-demographic variables: gender, age, occupation/profession, city/village, income, education, body height and weight, etc.

- Additional questions asked on health awareness (knowledge of obesity, under nutrition, non-communicable diseases), awareness about conventional nutritional contents in a package, general views on packaged food and noticeability of regulatory logos.

- All the FOPL's were asked to rate important aspects of FOPLs such as Comprehension, Credibility and Liking

Covariates

- Familiarity tests not included as they have generally been shown to have minimal impacts (Talati et al., 2017)

- Tested for colour blindness, preference for positive nutrients, label-reading behaviour and awareness of NCDs

- Checked for the effects of the manipulation through the primes through multiple tests on their willingness to buy chips and biscuits, the reported importance of various criteria such as – price, flavour, brand, warning of health risk, manufacturing date, the best before and expiry date as well as information about saturated fat, total sugar, salt/sodium, energy content and other nutrients – for deciding which products to buy were tested across primes

```mermaid
flowchart
    A[Study designed as a RCT with 15 treatments across the 5 label types] --> B[Sampling distribution across Rural / Urban and across States done basis their consumption of chips & biscuits]
    B --> C[Questionnaires and research protocols designed and pilot tested]
    C --> D[App designed and developed for data collection]
    D --> E[Field team of about 200 members recruited and trained]
    E --> F[Data collection via face-to-face interviews using a combination of physical and video call modes]
    F --> G[Concurrent data quality control through Live spot checks via built in tech in the app]
    G --> H[Data collation and tabulation]
    H --> I[Data analysis & robustness checks]
```

Study designed as a RCT with 15 treatments across the 5 label types → **Sampling distribution across Rural / Urban and across States done basis their consumption of chips & biscuits** → **Questionnaires and research protocols designed and pilot tested**

→ **App designed and developed for data collection** ← **Field team of about 200 members recruited and trained** ← **Data collection via face-to-face interviews using a combination of physical and video call modes**

→ **Concurrent data quality control through Live spot checks via built in tech in the app** → **Data collation and tabulation** → **Data analysis & robustness checks**

Geographical distribution of samples

Per capita consumption of chips and biscuits

Population of states – Rural / Urban

GSDP growth rates

→

Projected consumption shares of each state for rural / urban separately calculated

→

Treatment & Control samples distributed between Rural and Urban

↓

Samples distributed among states

Final dataset coverage – Across treatments and primes

Label Type	Variant	Group Code	Prime						Total	
			Healthy		Unhealthy		None			
			Target	Actual	Target	Actual	Target	Actual	Target	Actual
Control		C	800	809	800	805	800	811	2400	2425
Warning Label	1	T1	400	403	400	403	400	404	1200	1210
	2	T2	400	403	400	404	400	404	1200	1211
	3	T3	400	403	400	403	400	403	1200	1209
MLT	1	T4	400	403	400	403	400	403	1200	1209
	2	T5	400	403	400	403	400	403	1200	1209
	3	T6	400	403	400	404	400	403	1200	1210
Nutriscore (renamed as "Health Rating" in the labels)	A	T7	400	403	400	405	400	404	1200	1212
	C	T9	400	404	400	403	400	403	1200	1210
	E	T11	400	403	400	403	400	402	1200	1208
GDA	1	T12	400	403	400	403	400	404	1200	1210
	2	T13	400	403	400	403	400	403	1200	1209
	3	T14	400	405	400	402	400	403	1200	1210
Health Star Rating (renamed as "Health Rating" on the label)	1 Star	T15	400	402	400	402	400	403	1200	1207
	3 Star	T17	400	402	400	402	400	403	1200	1207
	5 Star	T19	400	402	400	404	400	402	1200	1208
Grand Total			6800	6854	6800	6852	6800	6858	20400	20564

Final dataset coverage – **Geography**

All treatment and control samples separately randomly allocated

State	Rural		Urban		Total	
	Target	**Actual**	**Target**	**Actual**	**Target**	**Actual**
Andhra Pradesh	649	654	726	729	1,375	1,383
Assam	453	453	162	166	615	619
Bihar	994	1,000	204	206	1,198	1,206
Chhattisgarh	172	173	109	109	280	282
Delhi	11	11	560	569	570	580
Gujarat	480	483	821	829	1,301	1,312
Haryana	310	312	357	358	667	670
Himachal Pradesh	103	105	23	33	126	138
Jharkhand	195	196	140	141	335	337
Karnataka	395	400	791	794	1,186	1,194
Kerala	331	340	496	497	827	837
Madhya Pradesh	497	498	420	431	917	929
Maharashtra	806	811	1,771	1,772	2,577	2,583
NE Group*	169	178	118	126	287	304
Odisha	275	277	134	135	409	412
Punjab	263	266	266	271	529	537
Rajasthan	594	602	433	438	1,027	1,040
Tamil Nadu	616	617	1,124	1,127	1,741	1,744
Uttar Pradesh	1,730	1,736	1,121	1,137	2,852	2,873
West Bengal	755	756	827	828	1,582	1,584
Total	**9,798**	**9,868**	**10,602**	**10,696**	**20,400**	**20,564**

Packs – no FOPL

Packs: FOPL – NS

Packs : FOPL -- HSR

Packs : FOPL – MTL

Packs : FOPL -- GDA

Glucose pack label:
kcal	Fat	Sat Fat	Sugar
497	21g	10g	0g
26%	30%	50%	0%

of an adult's daily reference intake

Chips pack label:
kcal	Fat	Sat Fat	Sugar	Salt
556	34.4g	16g	1.9g	1.02g
28%	49%	80%	2%	17%

of an adult's daily reference intake

Packs : FOPL – Warning labels

Primes used

Healthy Prime

Chips are consumed by a large majority of people in India. According to some research by scientists, people who eat chips, on an average, tend to have **better** health.

Biscuits are consumed by a large majority of people in India. According to some research by scientists, people who eat biscuits, on an average, tend to have **better** health.

Unhealthy Prime

Chips are consumed by a large majority of people in India. According to some research by scientists, people who eat chips, on an average, tend to have **bad** health.

Biscuits are consumed by a large majority of people in India. According to some research by scientists, people who eat biscuits, on an average, tend to have **bad** health.

Structure of Presentation

- The Research Question
- International Experience with FOPLs
- Study Design and Sampling
- **Data Collection and Dataset**
- Analysis and Results
- Recommendation

Live spot checks

- Instead of telephonic retrospective checking, a system for LIVE spot checks was used
- All interviews, whether physical or video-call based, required the investigator to join a Google meet and share the screen
- Anyone authorized for spot checks could randomly join any ongoing interview through Google meet from the app
- Spot checks were done by :
    - Team leads
    - State supervisors
    - Regional heads
    - Core operations team
    - IIM-A
    - Independent backed team @ Ahmedabad
    - Independent backed team @ Chennai

Spot check implementation in app

Scheduled interviews at any point in time shown **live**

Scheduled time of interview

09:53:00-Jeherul islam 7099221310
Forman (Rahamatul)

Respondent

13:41:00-Joynal abdin 8011998587
Rahamatul (Ahana Ghosh)

Investigator

14:22:00-Ennas Ali 7086579840
Rahamatul (Ahana Ghosh)

15:12:00-Moijuddin Ali 8099615774
Rahamatul (Ahana Ghosh)

15:30:00-Taijuddin Ali 9707509946
Rahamatul (Ahana Ghosh)

Direct links to every interview

Structured and open-ended feedback of spot checks

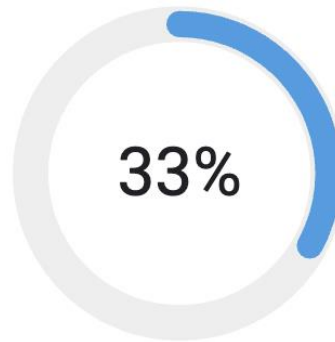Phone number of respondent for any query

Spot check summary of each investigator on app

89%

Manish (Arvind Shukla) - Active in last 5 days
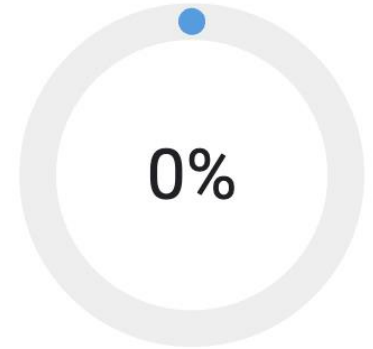
Good work so far

Total 206 interviews done, out of which 79 have been spot checked. Out of 79 spot checks, 70 were successful, 8 attempts failed and 1 were rejected.

33%

Krishna (Shyam Prasad) - Active in last 5 days

Too many SC failed

Total 89 interviews done, out of which 40 have been spot checked. Out of 40 spot checks, 13 were successful, 27 attempts failed and were rejected.

0%

Kavita (Shaili Tiwari) - Active in last 5 days

Not enough SC done

Total 7 interviews done, out of which 1 have been spot checked. Out of 1 spot checks, 0 were successful, 1 attempts failed and were rejected.

Quality control

For any investigator :

- First 5 days – Spot check summary has to be GREEN – otherwise fired from team

- Daily feedback on spot checks from all levels – overall and interview wise

- All teams knew that any investigator ending in RED will have ALL the data rejected – 3 such cases happened, one in Andhra Pradesh, Karnataka and Rajasthan each

- Benchmarks for being in the GREEN were:

  - Minimum 30% of the interviews to be spot checked (**Actual 58% overall**)

  - Not more than 25% of spot check attempts should fail

  - Not more than 10% of spot checks should lead to interview rejection

Final dataset coverage

Mode of conducting face-to-face interviews

State	Physical	Video Call
Andhra Pradesh	61.6%	38.4%
Assam	69.6%	30.4%
Bihar	65.9%	34.1%
Chhattisgarh	66.0%	34.0%
Delhi	57.1%	42.9%
Gujarat	56.2%	43.8%
Haryana	58.5%	41.5%
Himachal Pradesh	84.8%	15.2%
Jharkhand	52.8%	47.2%
Karnataka	53.3%	46.7%
Kerala	57.6%	42.4%
Madhya Pradesh	64.0%	36.0%
Maharashtra	51.0%	49.0%
NE Group*	76.3%	23.7%
Odisha	68.4%	31.6%
Punjab	57.5%	42.5%
Rajasthan	69.0%	31.0%
Tamil Nadu	61.0%	39.0%
Uttar Pradesh	77.8%	22.2%
West Bengal	54.5%	45.5%
Total	**62.0%**	**38.0%**

12751 respondents interviewed through **physical** face-to-face interviews reported **no difference** in their willingness to buy chips ($t(17079)= -1.583$, $p=0.1134$) as well as willingness to buy biscuits ($t(17302)= 1.3129$, $p=0.1892$) compared to 7811 respondents interviewed through **video call based** face-to-face interviews.
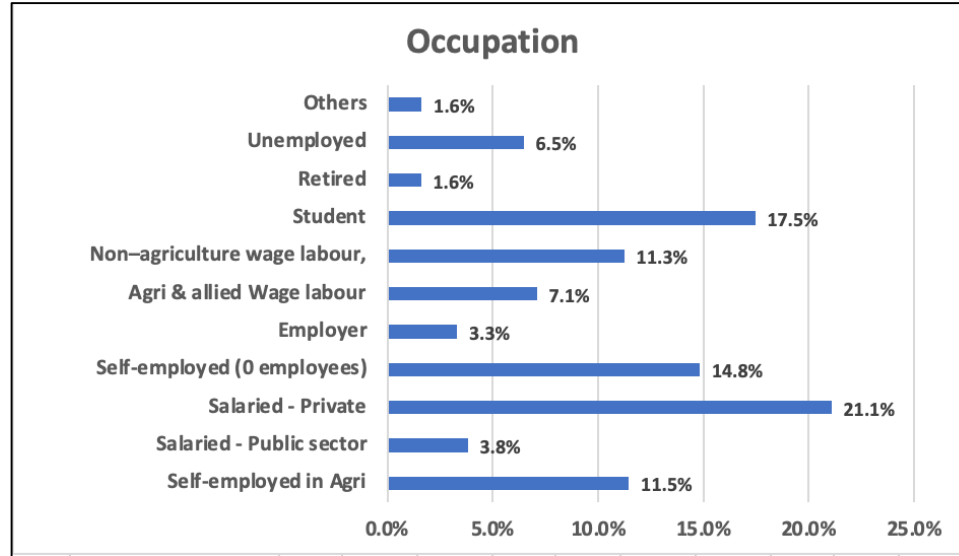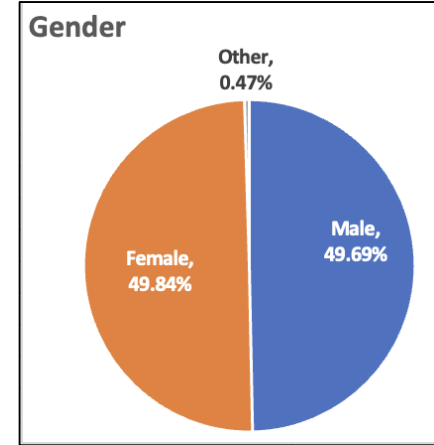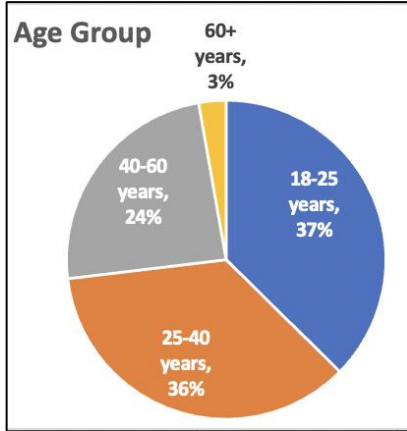
No significant difference on other parameters of interest (ease of understanding, identification of ingredients, gender, income, etc.)

Higher proportion* of video calls were observed in :
- Higher income HHs
- Younger respondents
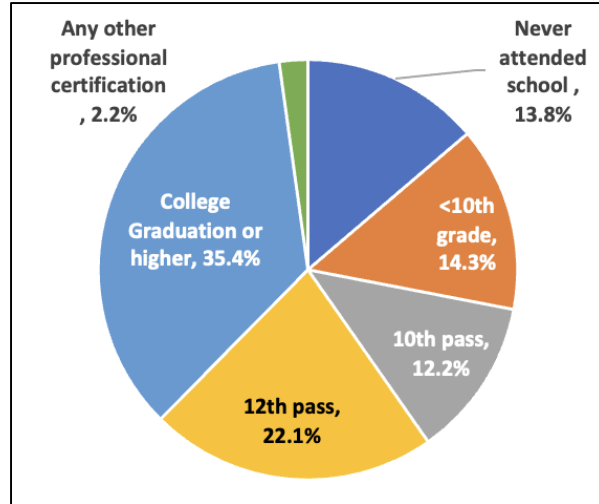- Higher educated respondents

*Significant at 95% levels
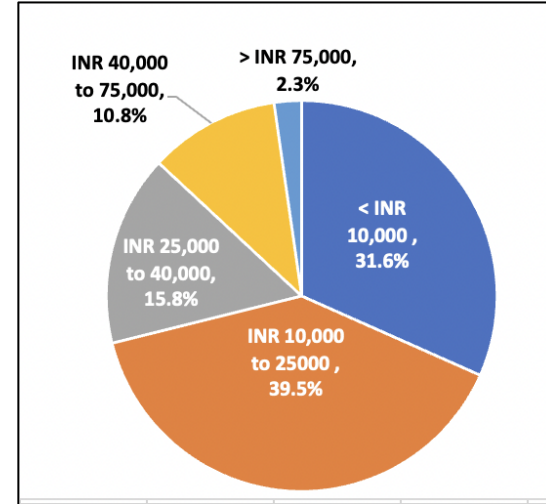
Final dataset – Respondent Profile

Age Group pie chart:
- 18-25 years, 37%
- 25-40 years, 36%
- 40-60 years, 24%
- 60+ years, 3%

Age group of 60+ years has a **lower willingness to buy chips** than the other age groups.

Gender pie chart:
- Male, 49.69%
- Female, 49.84%
- Other, 0.47%

Occupation bar chart:
- Others: 1.6%
- Unemployed: 6.5%
- Retired: 1.6%
- Student: 17.5%
- Non–agriculture wage labour: 11.3%
- Agri & allied Wage labour: 7.1%
- Employer: 3.3%
- Self-employed (0 employees): 14.8%
- Salaried - Private: 21.1%
- Salaried - Public sector: 3.8%
- Self-employed in Agri: 11.5%

Final dataset – Respondent Profile

Education level

Reported monthly household income

Checks for primes having worked

Outcomes

6854 respondents who were manipulated with a **healthy prime** reported a

higher willingness to buy chips (t(11152)= -41.015, p<0.001, d=0.7004 (medium))

as well as

higher willingness to buy biscuits (t(13681)= -5.8348, p<0.001, d=0.3471 (small))

compared to 6858 respondents who were **not manipulated** with any prime.

Checks for primes having worked

Outcomes

6852 respondents who were manipulated with a **unhealthy prime** reported a

lower willingness to buy chips (t(13696)= 4.7533, p<0.001, d=0.5075 (medium))

as well as

lower willingness to buy biscuits (t(13676)= 3.2045, p<0.001, d=0.2117 (small))

compared to 6858 respondents who were **not manipulated** with any prime.

Checks for primes having worked

Perceptions about healthiness of the product

6854 respondents who were manipulated with a **healthy prime** reported a

stronger perception of chips being healthy ($t(13677)$= 24.817, p<0.001, d= 0.4239 (small))

as well as

a **stronger perception of biscuits being healthy** ($t(13708)$= 29.615, p<0.001, d= 0.5058 (medium))

compared to 6858 respondents who were **not manipulated** with any prime.

Checks for primes having worked

Perceptions about healthiness of the product

6852 respondents who were manipulated with a **unhealthy prime** reported a

stronger perception of CHIPS being <u>unhealthy</u> (t(13226)= -12.141, p<0.001, d= 0.2074 (small))

as well as

stronger perception of BISCUITS being <u>unhealthy</u> (t(12625)= -6.1311, p<0.001, d= 0.1047 (negligible))

compared to 6858 respondents who were **not manipulated** with any prime.

Importance of criteria used for buying

A set of 6 questions asked for purchase of chips and
6 questions for biscuits

Captured on a 7 point scale

- Price

- Flavour

- Warning

- Warning/Instruction of health risk

- Manufacturing date, the best before and expiry date

- Information about saturated fat, total sugar, salt/sodium, energy content and other nutrients

Differences in importance of buying criteria across primes

Product	Criteria	Comparison between	Mean comparison (on a 7 point scale)	p-value	Effect Size (Cohen's d)
Chips	Warning on the pack	Healthy prime Vs No Prime	M(Healthy)=4.10 < M(No Prime)=4.73	<0.001	0.294 (small)
		Unhealthy prime Vs No Prime	M(Unhealthy)=6.06 > M(No Prime)=4.73	<0.001	0.818 (large)
	Information about nutrients on the pack	Healthy prime Vs No Prime	M(Healthy)=3.94 < M(No Prime)=5.14	<0.001	0.581 (medium)
		Unhealthy prime Vs No Prime	M(Unhealthy)=5.81 > M(No Prime)=5.14	<0.001	0.400 (small)
Biscuits	Warning on the pack	Healthy prime Vs No Prime	M(Healthy)=4.16 < M(No Prime)=4.88	<0.001	0.335 (small)
		Unhealthy prime Vs No Prime	M(Unhealthy)=5.96 > M(No Prime)=4.88	<0.001	0.638 (medium)
	Information about nutrients on the pack	Healthy prime Vs No Prime	M(Healthy)=3.97 < M(No Prime)=5.21	<0.001	0.600 (medium)
		Unhealthy prime Vs No Prime	M(Unhealthy)=5.86 > M(No Prime)=5.21	<0.001	0.401 (small)

For Price, Brand, Flavor and Manufacturing & Expiry date as criteria, no significant difference in means was observed across primes.

Structure of Presentation

- The Research Question
- International Experience with FOPLs
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- Recommendation

Performance of label types

- This FOP label is easy to **identify**/locate on the package

- This FOP label is easy to **understand**

- This FOP label provides me with all the **health information** I need

- The FOPL helps me easily **detect presence** of excess an undesirable nutrient

- This FOP label provides **reliable** information

- This FOP label is too **complex** for understanding

Performance of label types

Aspect of label	Product	Mean Score (SD)				
		Warning Label	MTL	GDA	HSR	NS
Ease of identification of label on pack	Chips	5.48 (1.66)	5.10 (1.87)	4.10 (2.12)	5.70 (1.71)	5.67 (1.68)
	Biscuits	5.59 (1.62)	5.26 (1.84)	4.18 (2.19)	5.81 (1.71)	5.78 (1.65)
Ease of understanding of label	Chips	5.04 (1.54)	4.14 (2.08)	3.95 (2.12)	5.49 (1.81)	4.85 (1.53)
	Biscuits	5.06 (1.53)	4.18 (2.07)	3.99 (2.12)	5.49 (1.80)	4.88 (1.52)
Label gives all the health information needed	Chips	5.03 (1.74)	5.51 (1.71)	5.22 (1.64)	5.29 (1.94)	4.73 (1.58)
	Biscuits	5.07 (1.67)	5.54 (1.66)	5.31 (1.57)	5.34 (1.88)	4.79 (1.53)
Label helps detect presence of excess of an unwanted nutrient	Chips	5.32 (1.92)	5.37 (1.64)	4.76 (1.50)	3.78 (1.72)	3.79 (1.94)
	Biscuits	5.36 (1.89)	5.38 (1.60)	4.81 (1.47)	3.81 (1.70)	3.83 (1.91)
Reliability of information provided	Chips	5.33 (1.88)	5.17 (1.61)	4.31 (1.59)	5.32 (1.94)	4.09 (1.83)
	Biscuits	5.40 (1.84)	5.21 (1.56)	4.42 (1.57)	5.33 (1.91)	4.20 (1.83)
Complexity (Lesser is better)	Chips	3.46 (1.78)	4.52 (2.02)	4.62 (2.02)	2.96 (2.12)	3.73 (1.73)
	Biscuits	3.45 (1.78)	4.50 (1.74)	4.65 (2.02)	3.01 (2.14)	3.72 (1.74)

Except for "Reliability", the differences in mean across HSR-MTL and HSR-Warning Labels are significant at 95% levels.

Performance of label types: Rank

Aspect of label	Product	Rank				
		Warning Label	MTL	GDA	HSR	NS
Ease of identification of label on pack	Chips	3	4	5	1	2
	Biscuits	3	4	5	1	2
Ease of understanding of label	Chips	2	4	5	1	3
	Biscuits	2	4	5	1	3
Label gives all the health information needed	Chips	4	1	3	2	5
	Biscuits	4	1	3	2	5
Label helps detect presence of excess of an unwanted nutrient	Chips	2	1	3	5	4
	Biscuits	2	1	3	5	4
Reliability of information provided	Chips	1	3	4	2	5
	Biscuits	1	3	4	2	5
Complexity	Chips	2	4	5	1	3
	Biscuits	2	4	5	1	3

Performance of label types: Mean Rank

	Rank	Warning Label	MTL	GDA	HSR	NS
Occurrences of each rank in the 12 label X product combos	1	2	4	0	6	0
	2	6	0	0	4	2
	3	2	2	4	0	4
	4	2	6	2	0	2
	5	0	0	6	2	4
Total rank score		28	34	50	24	48
Average Rank score		2.33	2.83	4.17	2.00	4.00

- Overall, **HSR** seems to be the TOP performer, followed by Warning Labels

- HSR is 1st or 2nd on all items except "*Label helps detect presence of excess of an unwanted nutrient*", which it is not designed to do.

Performance of label types: Purchase Intentions

No prime control with no FOPL vs. unhealthy prime each FOPL

Comparison	Product	Mean of intention to buy	p-value at 95%	Significance
Unhealthy prime Warning labels Vs. No prime Control	Chips	$M_{CWUP} = 1.72$, $M_{CCNP} = 1.33$	p < .01	Significant at 1%
	Biscuits	$M_{BWUP} = 1.52$, $M_{BCNP} = 1.33$	p < .01	Significant at 1%
Unhealthy prime MTL Vs. No prime Control	Chips	$M_{CMUP} = 1.70$, $M_{CCNP} = 1.33$	p < .01	Significant at 1%
	Biscuits	$M_{BCUP} = 1.46$, $M_{BCNP} = 1.33$	p < .01	Significant at 1%
Unhealthy prime GDA Vs. No prime Control	Chips	$M_{CMUP} = 1.69$, $M_{CCNP} = 1.33$	p < .01	Significant at 1%
	Biscuits	$M_{BCUP} = 1.46$, $M_{BCNP} = 1.33$	p < .01	Significant at 1%
Unhealthy prime NS Vs. No prime Control	Chips	$M_{CMUP} = 1.67$, $M_{CCNP} = 1.33$	p < .01	Significant at 1%
	Biscuits	$M_{BCUP} = 1.47$, $M_{BCNP} = 1.33$	p < .01	Significant at 1%
Unhealthy prime HSR Vs. No prime Control	Chips	$M_{CMUP} = 1.72$, $M_{CCNP} = 1.33$	p < .01	Significant at 1%
	Biscuits	$M_{BCUP} = 1.49$, $M_{BCNP} = 1.33$	p < .01	Significant at 1%

Performance of label types: Purchase Intentions

No prime control with no FOPL vs. healthy prime each FOPL

Comparison	Product	Mean of intention to buy	p-value at 95%	Significance
Healthy prime Warning labels Vs. No prime Control	Chips	$M_{CWHP} = 1.23$, $M_{CCNP} = 1.33$	$p < .01$	Significant at 1%
	Biscuits	$M_{BWHP} = 1.26$, $M_{BCNP} = 1.33$	$p < .01$	Significant at 1%
Healthy prime MTL Vs. No prime Control	Chips	$M_{CMHP} = 1.18$, $M_{CCNP} = 1.33$	$p < .01$	Significant at 1%
	Biscuits	$M_{BCHP} = 1.24$, $M_{BCNP} = 1.33$	$p < .01$	Significant at 1%
Healthy prime GDA Vs. No prime Control	Chips	$M_{CMHP} = 1.20$, $M_{CCNP} = 1.33$	$p < .01$	Significant at 1%
	Biscuits	$M_{BCHP} = 1.25$, $M_{BCNP} = 1.33$	$p < .01$	Significant at 1%
Healthy prime NS Vs. No prime Control	Chips	$M_{CMHP} = 1.20$, $M_{CCNP} = 1.33$	$p < .01$	Significant at 1%
	Biscuits	$M_{BCHP} = 1.24$, $M_{BCNP} = 1.33$	$p < .01$	Significant at 1%
Healthy prime HSR Vs. No prime Control	Chips	$M_{CMHP} = 1.23$, $M_{CCNP} = 1.33$	$p < .01$	Significant at 1%
	Biscuits	$M_{BCHP} = 1.27$, $M_{BCNP} = 1.33$	$p < .01$	Significant at 1%

Observations: Gender

- Cited importance of "Warning on pack" as a parameter for buying increases with the unhealthy prime – more in females than in males (larger effect size)

- Regionally HSR is strongly supported by the South, Central and West regions, with it's performance being not as strong in the North and average in the Eastern region

- HSR's higher performance than other labels are **much more in females**, where the overall performance of HSR is clearly the best followed by Warning Label and then by MTL. In males, the difference with MTL and Warning labels goes down

- Among males, MTL is seen as having either very good (Rank 1) positions on 3 items or very poor (Rank 4) positions on 3 items, whereas Warning labels have a somewhat more consistent good performance (Rank 2) on 4 items along with a Rank 3(Ease of Identification) and a Rank 4 (Giving all health information needed).

Observations: Age

- Next, **across age groups**, HSR performs the best clearly among the older age groups (40-60 years and 60+ years), followed by Warning labels and then by MTL. The difference becomes smaller in the 25-40 years age group, and even smaller among the 18-25 years age group

- Specifically, in the 18-25 years age group, MTL is seen as having either very good (Rank 1) positions on 3 items or very poor (Rank 4) positions on 3 items, whereas Warning labels have a somewhat more consistent good performance (Rank 2) on 4 items along with a Rank 3 (Ease of Identification) and a Rank 4(Giving all health information needed)

Observations: Age

- The performance of HSR is similar among females and the older age groups. Perhaps this can be explained by a common higher sensitivity towards healthy food among females and older age groups

- There is some support for this line of thinking in terms of 10218 males reported a higher willingness to buy chips ($t(20451) = -2.9759$, $p = 0.003$) as well as higher willingness to buy biscuits ($t(20437) = -4.0674$, $p < 0.001$) compared to 10250 females

Observations: Age

- Similarly, the age group of 60+ years has a lower willingness to buy chips than the other age groups

- Next, comparing the **rural subpopulation of the sample with the urban one**, it is interesting that HSR is a clear winner in urban, followed by Warning label and MTL. However, in rural, the comparison is quite close between Warning label, HSR and MTL, with Warning label being very marginally ahead of HSR followed by MTL.

- Perhaps this could be explained by the relative differences in consumption basket or higher urban exposure (and familiarity) with star ratings on other product categories.

Observations: Occupations

- HSR finds very strong support among those in salaried (private sector) jobs, self-employed, non-agricultural wage labour, as well as those that reported being unemployed.

- HSR also was a close second among those that are self-employed in agriculture, those in agriculture and allied wage labour and those that are employers. Interestingly, HSR's performance among students was very poor.

- On the other hand, Warning labels find very strong support among those that are self-employed in agriculture as well as in agriculture and allied wage labour, as well as those that are employers.

Observations: Occupations

- Warning Labels were also a close second among those in public sector salaried jobs as well as those that are unemployed. Warning Labels were also a distinct second among those that are self-employed, students and well as those in non-agricultural wage labour

- MTL found strong support among students, while being marginally ahead of Warning labels among those in public sector salaried jobs

- Thus, overall HSR and Warning Labels found the most broad-based support across occupations. Between the two, HSR's support was more intensive while Warning Label's support was more extensive across occupations.

Observations: Label-reading behavior

On asked about whether the respondent reads the labels at the back of the pack currently when buying a product, about 65% **self-report** that they read labels, as compared to about 23% who report that they do not read labels. Another 5% mentioned that they are not aware of back of pack labels, while 6% reported that reading labels depends on the product.

Correlating with FOPL performance :

- It is seen that HSR remains the top performer across all these sub-groups
- HSR is a clear winner among the sub-group that is not aware of labels as well as the sub-group that reads labels
- Warning Labels are close to HSR among the sub-group which has reported reading labels depending on the product, and those that do not read labels
- Interestingly, the performance of MTL is the worst among the sub-group not aware of labels as compared to the other sub-groups – that is to say that those who are not aware of labels have given the least support to MTL.

Observations: Knowledge on morbidities

Perception of having knowledge about morbidities, including obesity, undernutrition, metabolic disorders and NCDs, captured on a scale of 1 to 7, (7 being the highest) :
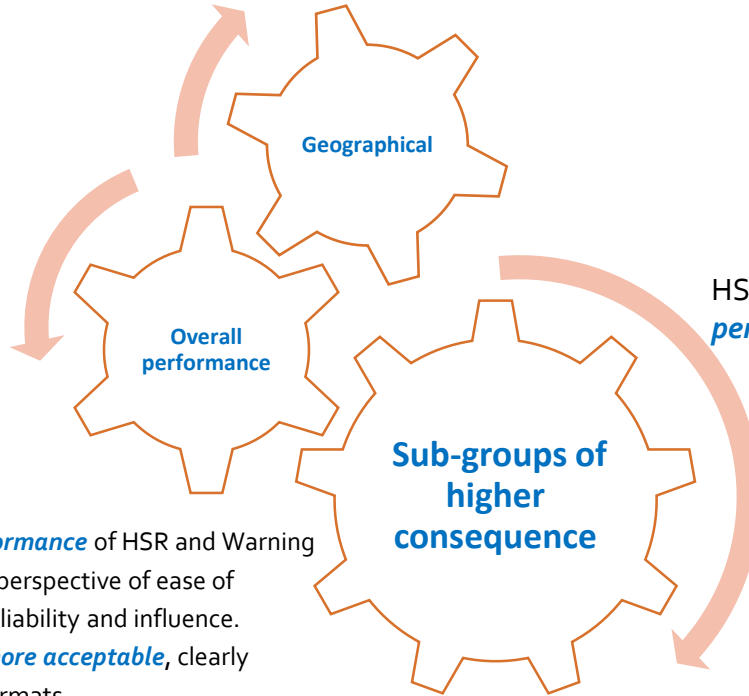
- The mean self-reported awareness levels were 4.53 (sd=1.84) for Obesity, 4.33 (sd=1.85) for Undernutrition, 4.36 (sd=1.87) for Metabolic disorders and 4.34 (sd=1.87) for NCDs, with a slightly higher mean among urban (vs. rural) and among the more educated.

- It is found that on the ease of identification as well as ease of understanding, lower knowledge levels about morbidities have a correlation with positive support for HSR and Warning Label at order labels in that order

- On the other hand, higher knowledge about morbidities corresponds to higher support for MTL and GDA in that order

Structure of Presentation

- The Research Question
- International Experience with FOPLs
- Study Design and Sampling
- Data Collection and Dataset
- Analysis and Results
- **Recommendation**

Conclusions

HSR finds greater support among the Southern, Central and Western regions of the country, which have *higher consumption levels.*

Geographical

Overall performance

Sub-groups of higher consequence

- On an average, the *overall performance* of HSR and Warning Labels are the highest from the perspective of ease of identification, understanding, reliability and influence.
- Among the two, *HSR appears more acceptable*, clearly outdoing the nutrient specific formats
- MTL was most preferred when it came to reflecting necessary health information and presence of an unwanted nutrient, however, *ranked low in other parameters*.

HSR has *stronger performance* among

Females

Individuals **primarily responsible** for grocery shopping

Urban individuals

Individuals that **read labels** presently

Those don't read labels because they are **not aware of labels**

Those who do not want information about good nutrients on the FOPL

Recommendations

- If the primary objective is ease of identification and understanding, then we recommend HSR

- If change of purchase intention is most desired, then we recommend any of the five designs, with a marginal preference for MTL

- If the objective of introducing an FOPL is a careful combination of, both, ease of identification and understanding on one hand, and change of purchase intention on the other, then we recommend HSR as the preferred FOPL