Nutritional and healthy diet for food system transformation in Asia

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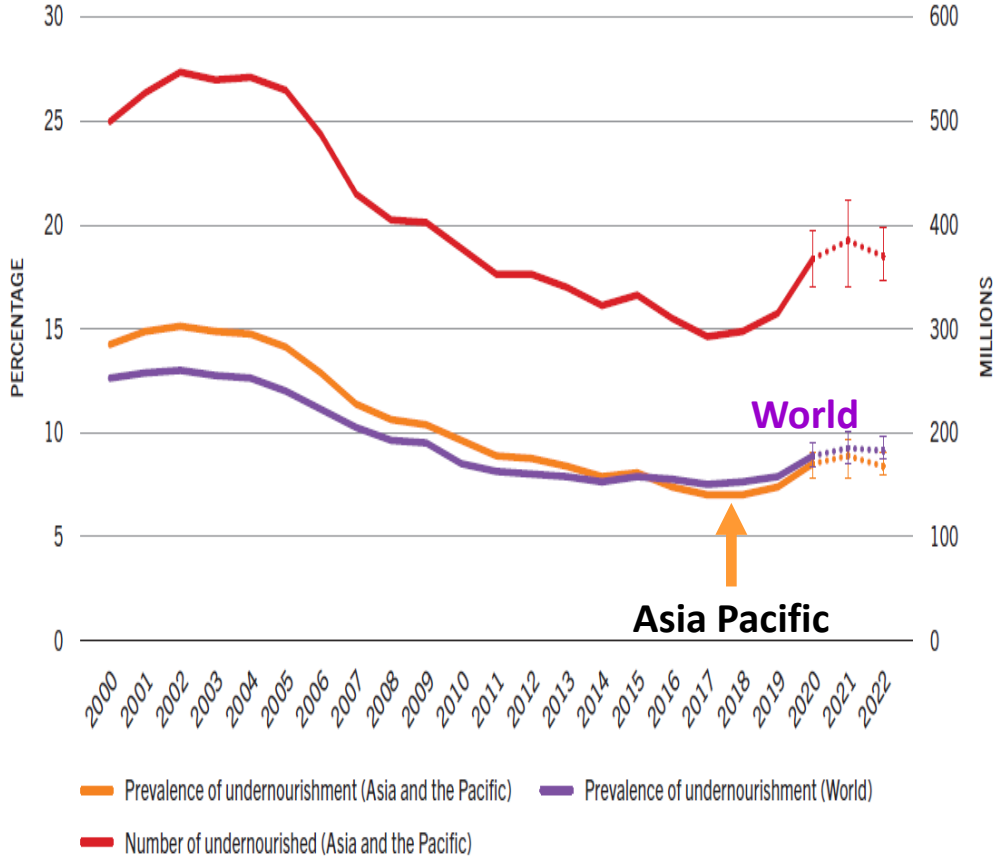
OUTLINE

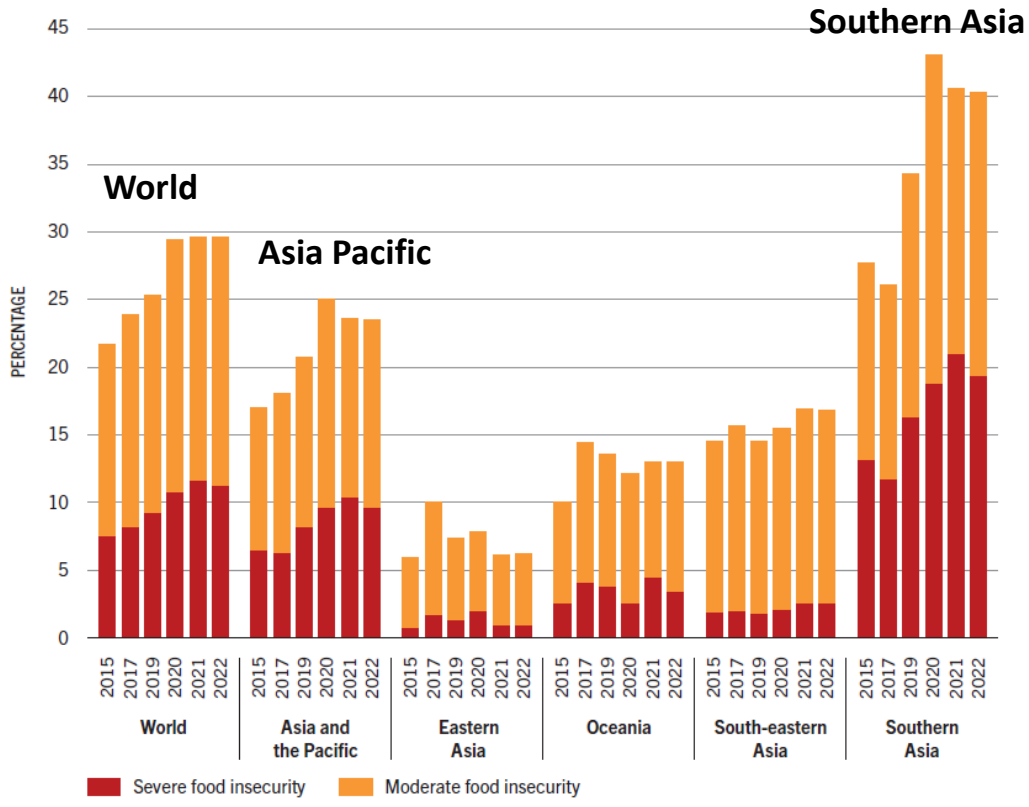
- Challenges: food Insecurity/malnutrition in Asia Pacific at-a-glance
- Food systems framework-healthy diet concept; consumer-focus
- Selected promising approaches:
    - Food-based Dietary Guidelines (FBDGs)
    - Nutrients in Food Supply-small farm, biofortification, large-scale food fortification
    - Fiscal policies - example of sugar tax
- Key messages

Asia Pacific: Undernourishment and Moderate/Severe (Hunger) Food Insecurity- HALF of the World population, higher than pre-pandemic era

Undernourishment: 8.4% AP vs 9.2% World; AP- 370 M affected (2022)



Food Insecurity: 23.5% AP vs 29.6% World; highest in Southern Asia (2022)



FAO. 2023. Asia and the Pacific – Regional Overview of Food Security and Nutrition 2023: Statistics and trends

The Challenge: Malnutrition in all its forms

- Undernutrition

  - Wasting: low wt for ht from food insecurity and/or infection; mod/severe child-wasting increases risk of death

  -Stunting: low ht for age due to chronic/recurrent undernutr; poverty; poor maternal hlth/nutr; frequent illness; inappropriate infant-young child feeding

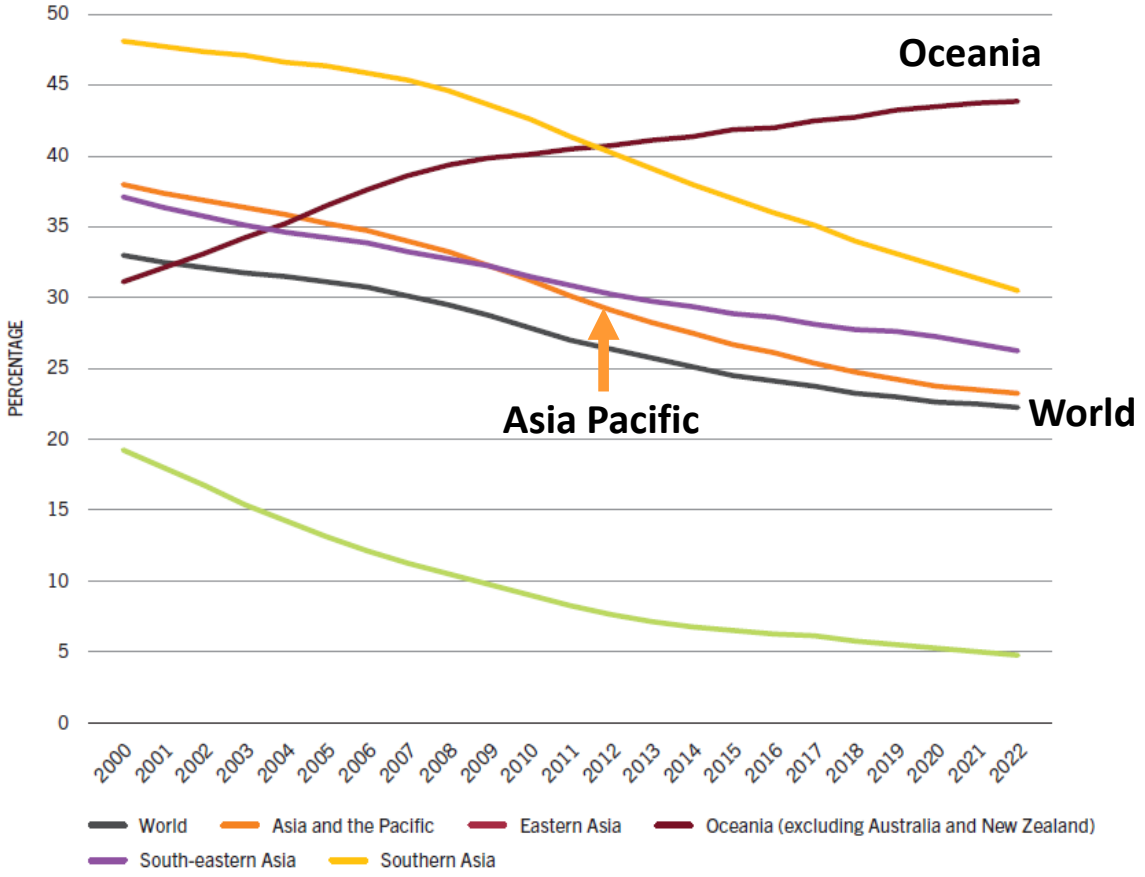
  -Underweight: low wt for age – coupled with stunting and/or wasting

- Micronutrient-related malnutrition: deficiencies of iodine, vitamin A, iron – main PBH concerns (Note: zinc, folate,vit D, thiamine--sp. settings)
- Overweight/Obesity: too heavy for ht; excess fat accumulation; BMI >25 or >30 due to intake of energy-dense foods + too little physical activity
- Diet-related non-communicable diseases (NCDs): diabetes, hypertension, cardiovascular diseases, cancer etc

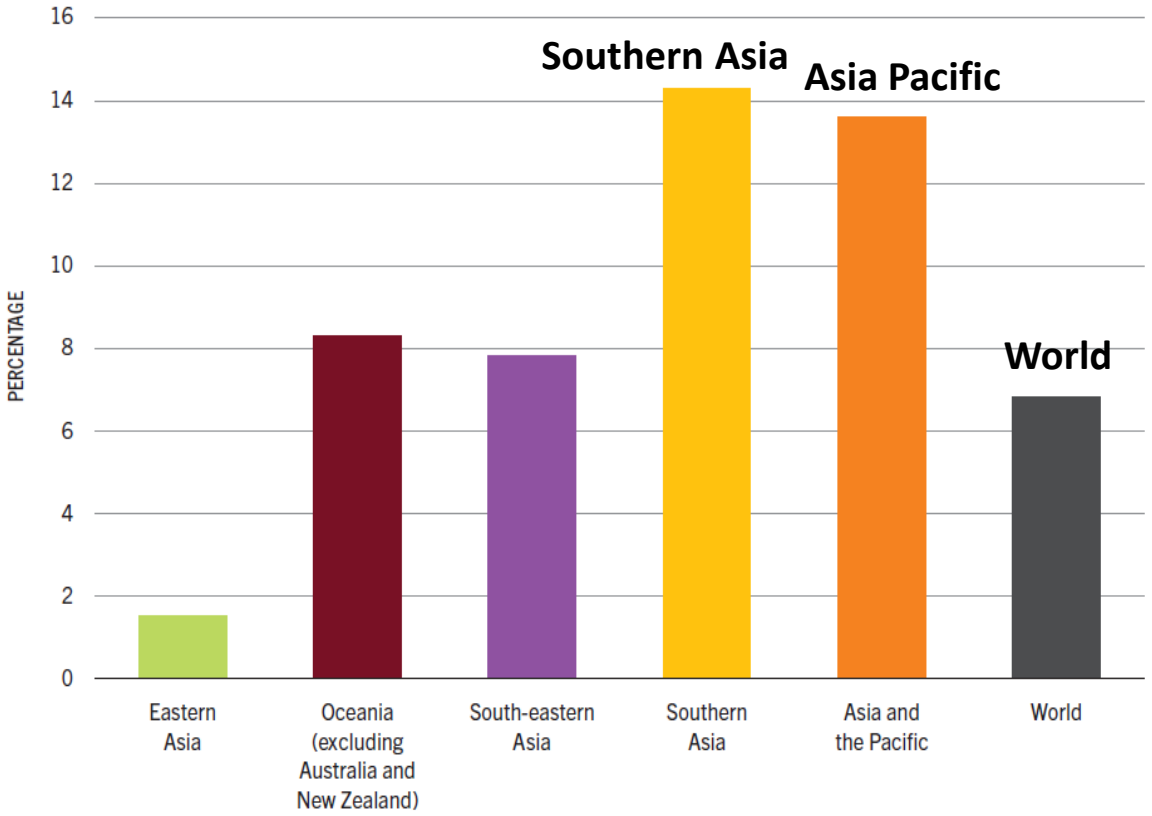
WHO/Newsroom/Fact Sheets/Detail/Malnutrition 2024

Asia- Pacific unfinished agenda: under-5 Stunting decline towards world avg except Oceania; Wasting – double world's figure, highest in Southern Asia

Stunting 23.4% AP vs 22.3% world;
44% Oceania (2022)



Wasting 13.6% AP vs 6.8% world; 14.3% Southern Asia (2022)



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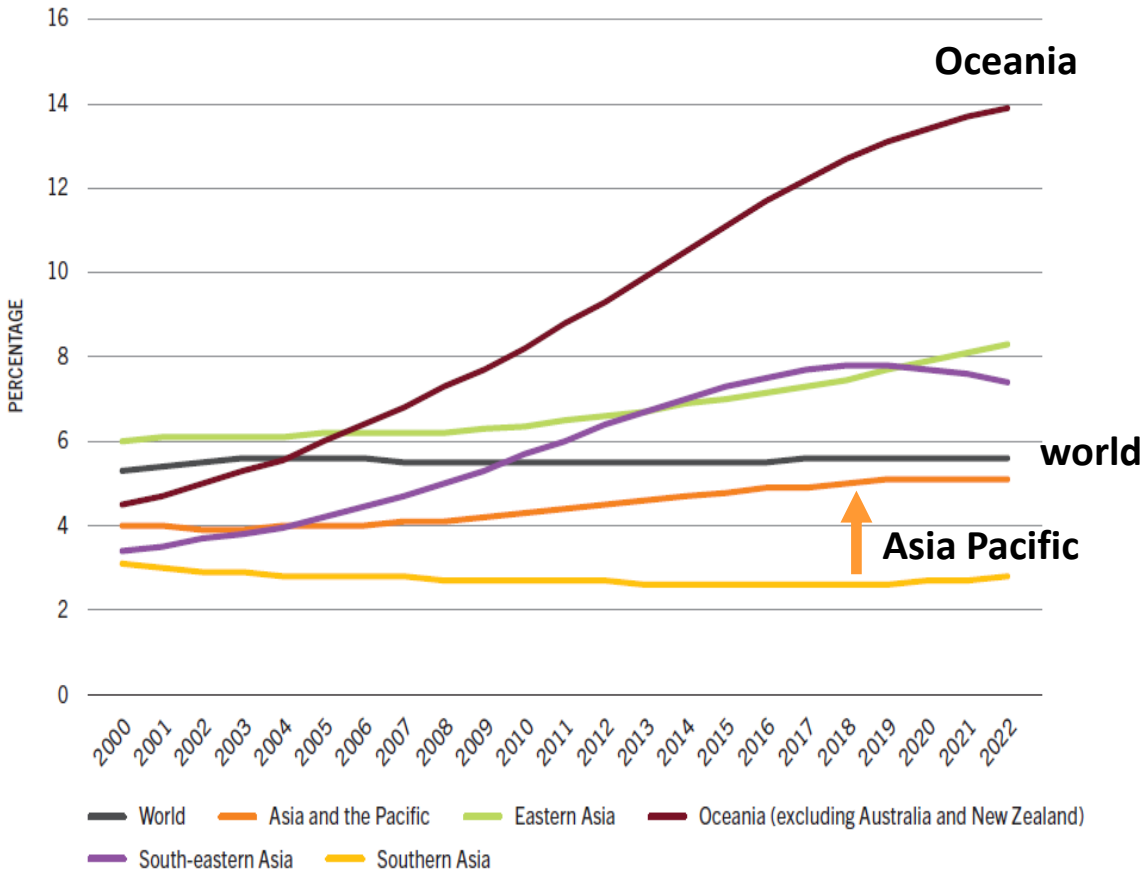
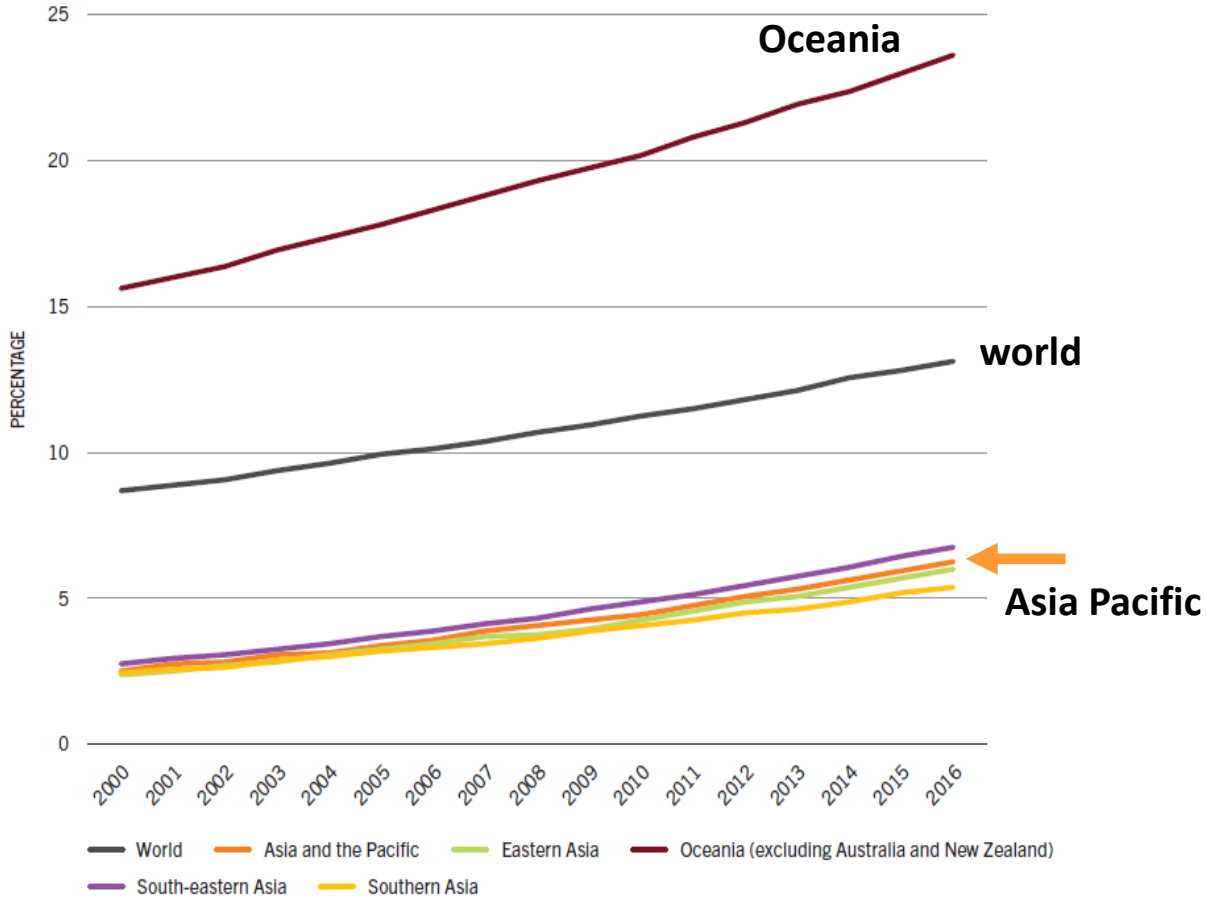
Asia Pacific-rising trends in under 5 overweight and adult obesity; highest prevalence in Oceania

Overwt: 5.1% AP vs 5.6% World; 13.9% Oceania (2022)



Adult Obesity: 6.2% AP vs 13.1% World; 23.6% Oceania (2016)



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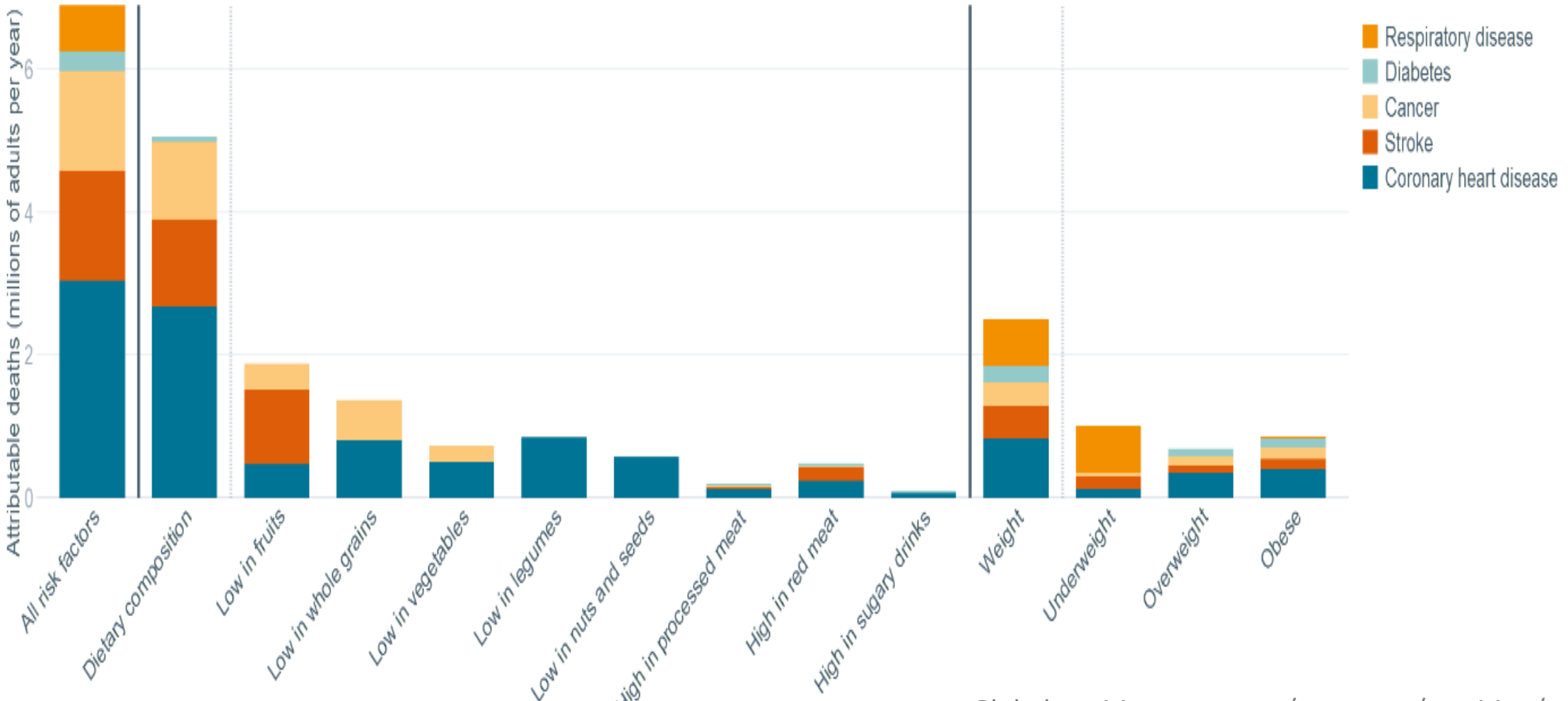
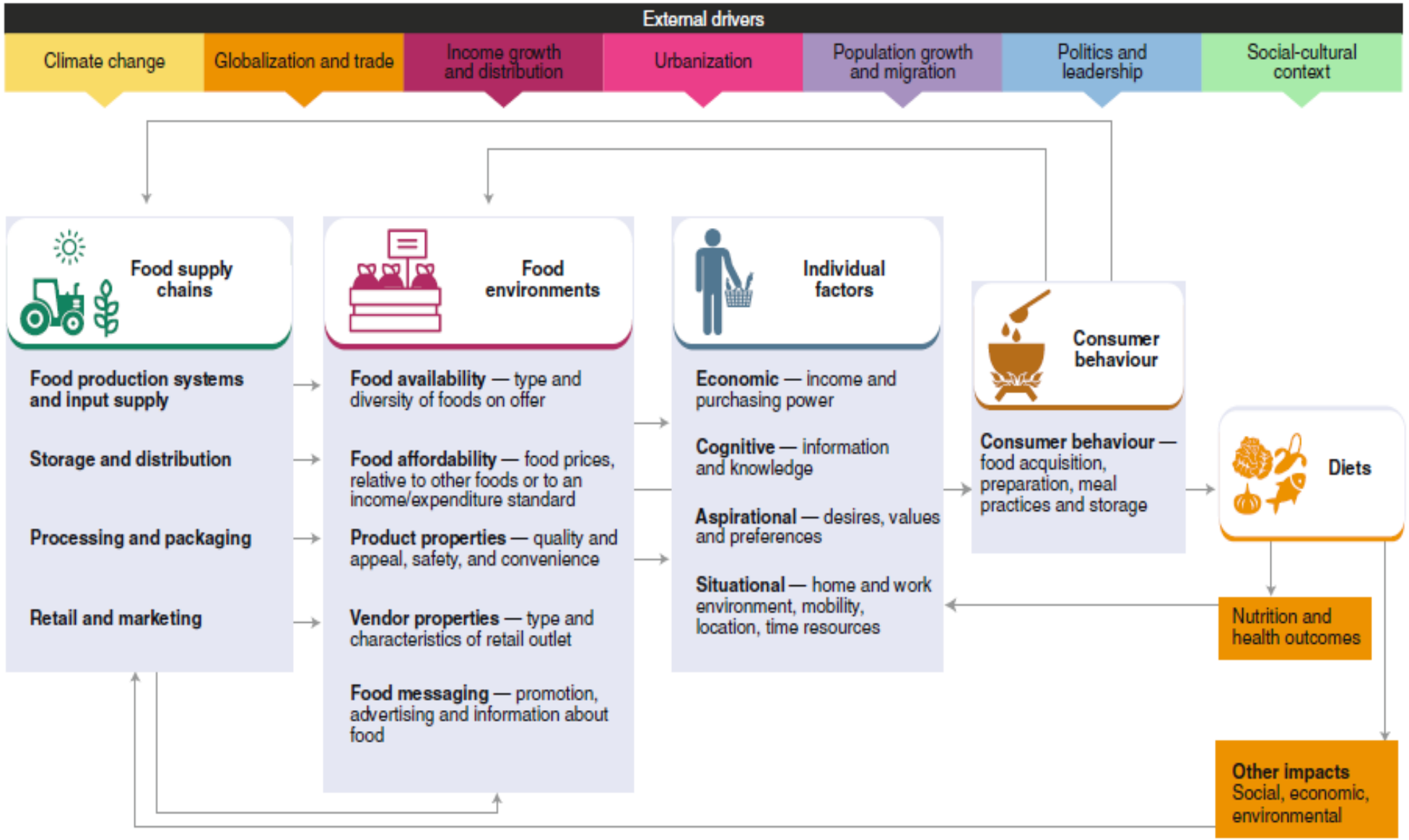
Unhealthy diet – major attribute for deaths due to NCDs in ASIA



Globalnutritionreport.org/resources/nutrition/asia

Food Systems Framework to deliver Healthy Diets for Nutrition/Hlth outcomes



Source: The Food Systems Dashboard. Global Alliance for Improved Nutrition (GAIN) and Johns Hopkins University. 2020.

What constitute Healthy Diets?

Four Core Principles plus SAFETY in diets/beverages

Adequate	Balanced
Providing enough essential nutrients to prevent deficiencies and promote health, without excess.	In energy intake, and energy sources (i.e., fats, carbohydrates and proteins) to promote healthy weight, growth and disease prevention.
Moderate	**Diverse**
In consumption of foods, nutrients or other compounds associated with detrimental health effects.	Including a wide variety of nutritious foods within and across food groups to favour nutrient adequacy and consumption of other health promoting substances.

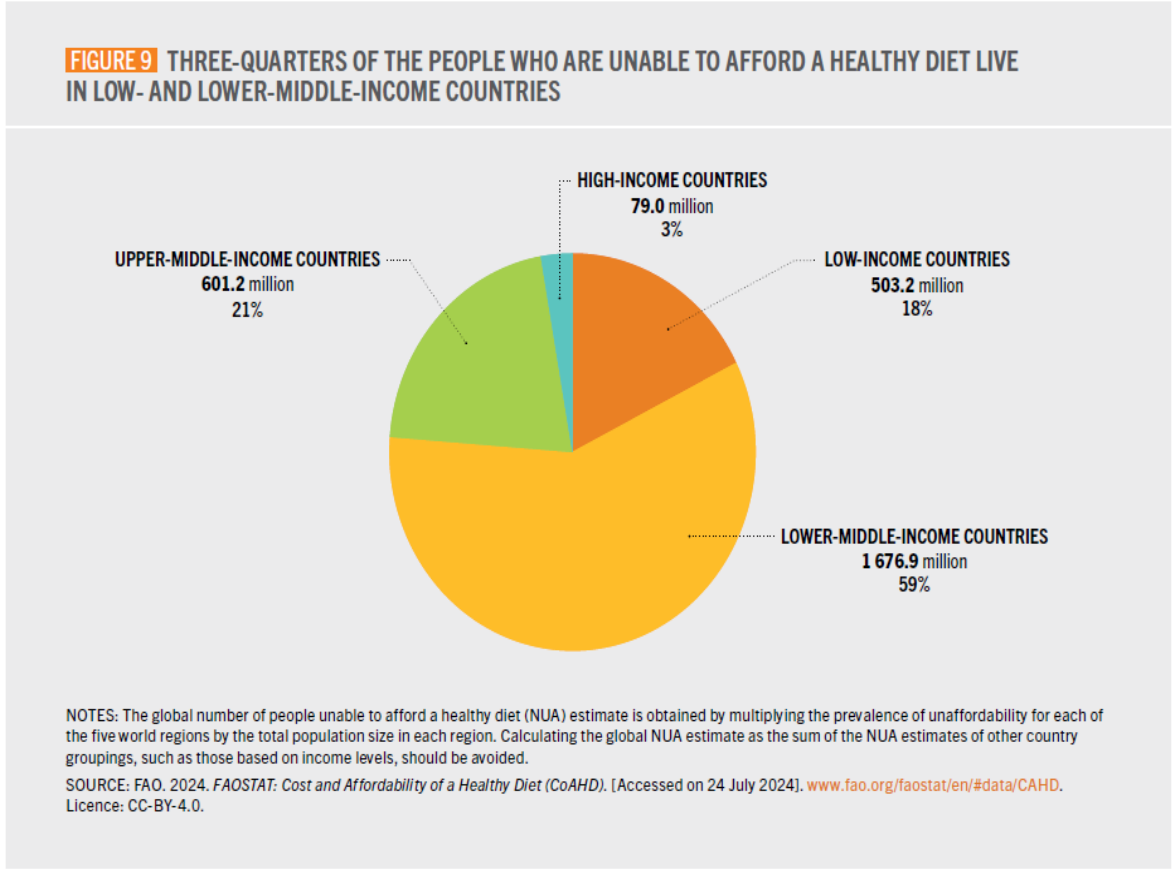
Source: What are healthy diets? Joint Statement FAO-WHO 2024

Features of Healthy Dietary Pattern

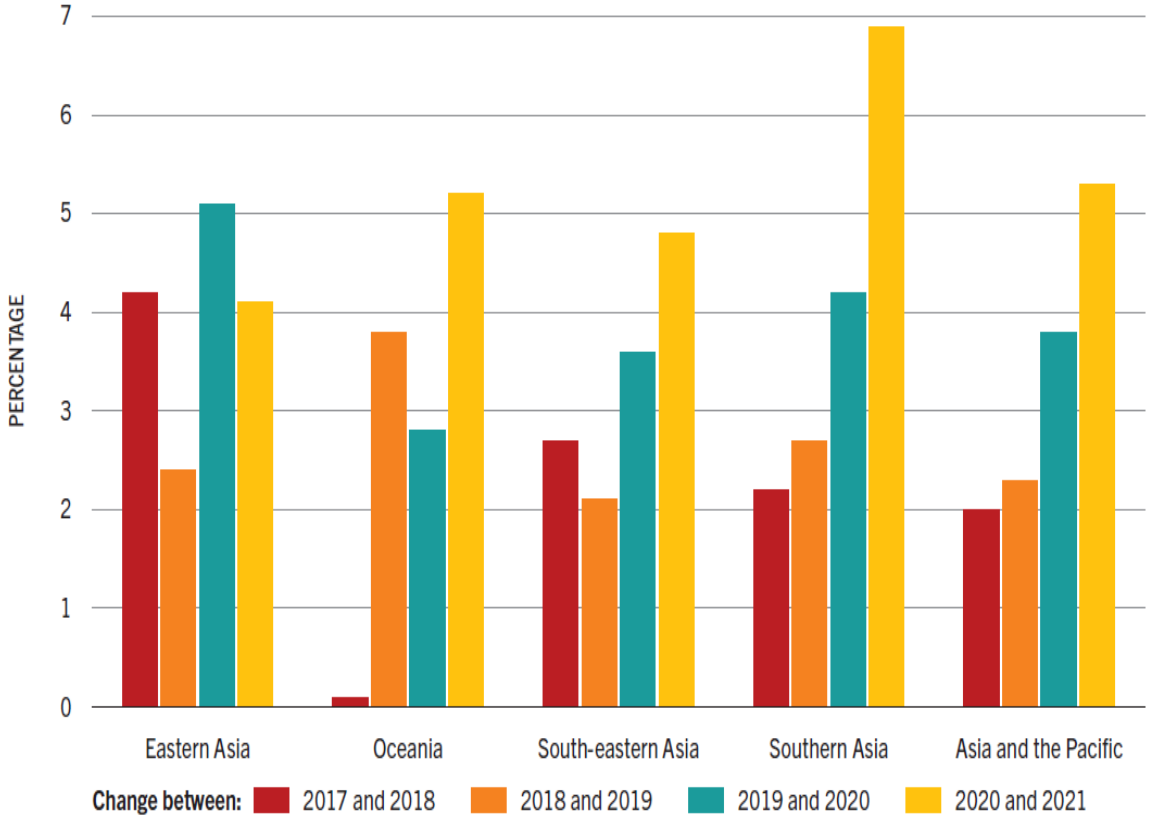
- Provide Nutrients from diversity of foods: whole grains, vegetables, fruits, legumes, nuts, animal source foods in varying quantities
- Focus on health protective elements: MORE foods with nutrients, fiber, bioactive components; LIMIT those with high salt, sugar, saturated fat
- Recognize availability of local foods, cultural contexts, consumer's preferences
- Consider physiological nutrient requirements based on age, gender, physical activity, specific conditions- pregnancy and lactation

The Cost of Healthy Diet is beyond reach for 2.83 Billion World Population

77% of those unable to afford healthy diet live in Low-& LMICs (SOFI 2024)

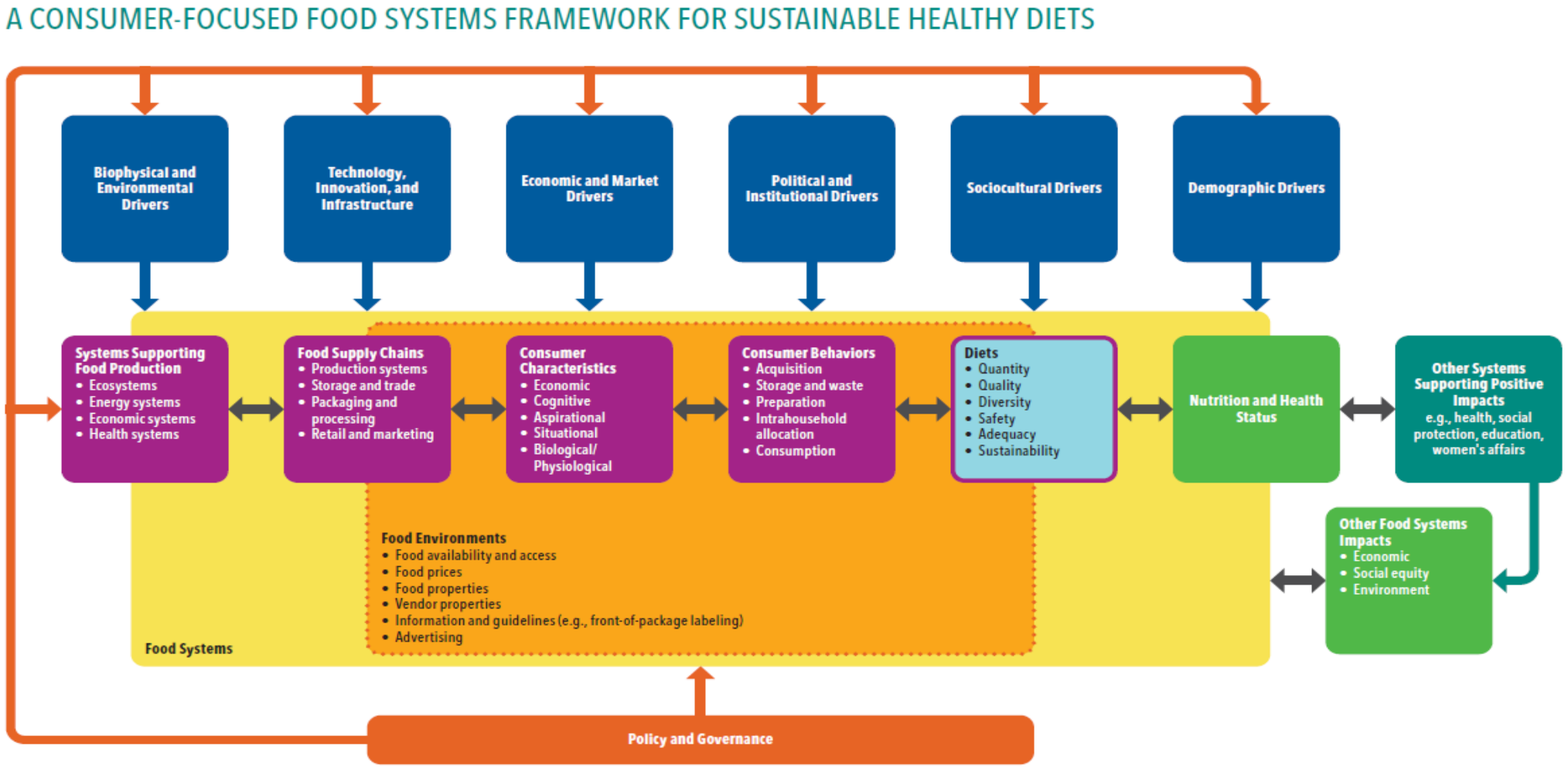


Avg cost of healthy diet in AP 4.15 PPP dollars – 5% increase, est 232.8 M unable to afford in 2021



FAO SOFI 2024, SOFI 2023 Asia and the Pacific

Reorient Food Systems to address demand-Consumer; food environment esp Affordability and Nutrients in food supply; **connectivity with other systems: health, education, social protection, WASH



Source: Adapted from High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, *Food Security and Nutrition: Building a Global Narrative Towards 2030* (Rome: 2020).

IFPRI 2024 Global Food Policy Report: Food Systems for Healthy Diets and Nutrition

Selected Promising Approaches

- Guiding the DEMAND on Healthy Diets: National Food-Based Dietary Guidelines
- Leveraging Nutrients in Food Supply: Small farms, Biofortification and Large-scale Food Fortification (LSFF)
- Regulation to PROTECT consumer's health: Fiscal Policies- Sugar Tax

What are food-based Dietary Guidelines (FBDGs)?

National evidence-based FBDGs as a policy and education tool:

- A food-based approach to guide the public on food choice, food preparation and intake for healthy diets across age groups: preschool, school-adolescents, adults, elderly; as well as pregnant/lactating women
- Guide Nutrition/school education, diet counselling (SBCC), health promotion, individual/ inst meal planning etc
- Strategic planning - agricultural diversification, food production and product innovations
- *Consumer empowerment to demand more nutritious foods from the food systems

More than 100 countries have established National Food-based Dietary Guidelines

Africa: 11	Europe: 34
Asia & Pacific: 18	Latin America & the Caribbean: 29
Near East: 6	North America: 2

Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

A Science-based approach to embed the 4 principles/ properties of a healthy diet into the development of FBDGs

	Nutrient Adequacy	Macronutrient Balance	Moderation	Diversity
Evidence Review – Country situations on Health & diseases, food production & consumption, culturally food habits, food trade, food prices, food environment, food & nutrition policies & programmes, etc.	Yes	Yes	Yes	Yes
Evidence Review – Global/Natl RDAs, Diet/Hlth Recommendations	Yes	Yes	Yes	Yes
Multi-stakeholder consultation			Yes	Yes
Diet Modelling for **optimizing diversity & quantity of food intake**	Yes	Yes	Yes	Yes
Pilot testing of FBDG		Yes	Yes	Yes

Example-FBDGs for children 2-5 yr: Thailand-Linear Programming Optifood to identify best local foods for limiting nutrients; Myanmar adopted Thai Food Composition database in FBDGs development

FBDGs Thailand-Nutrition Flag for 2-5 yrs old

Sources: Nutrition Bureau, MOPH/Thailand; FAO/RAP, Bangkok, Thailand

Smallholder farms produce one-third of the world's food

The cumulative share of the world's agricultural land, crop production and food supply, broken down by farm size.

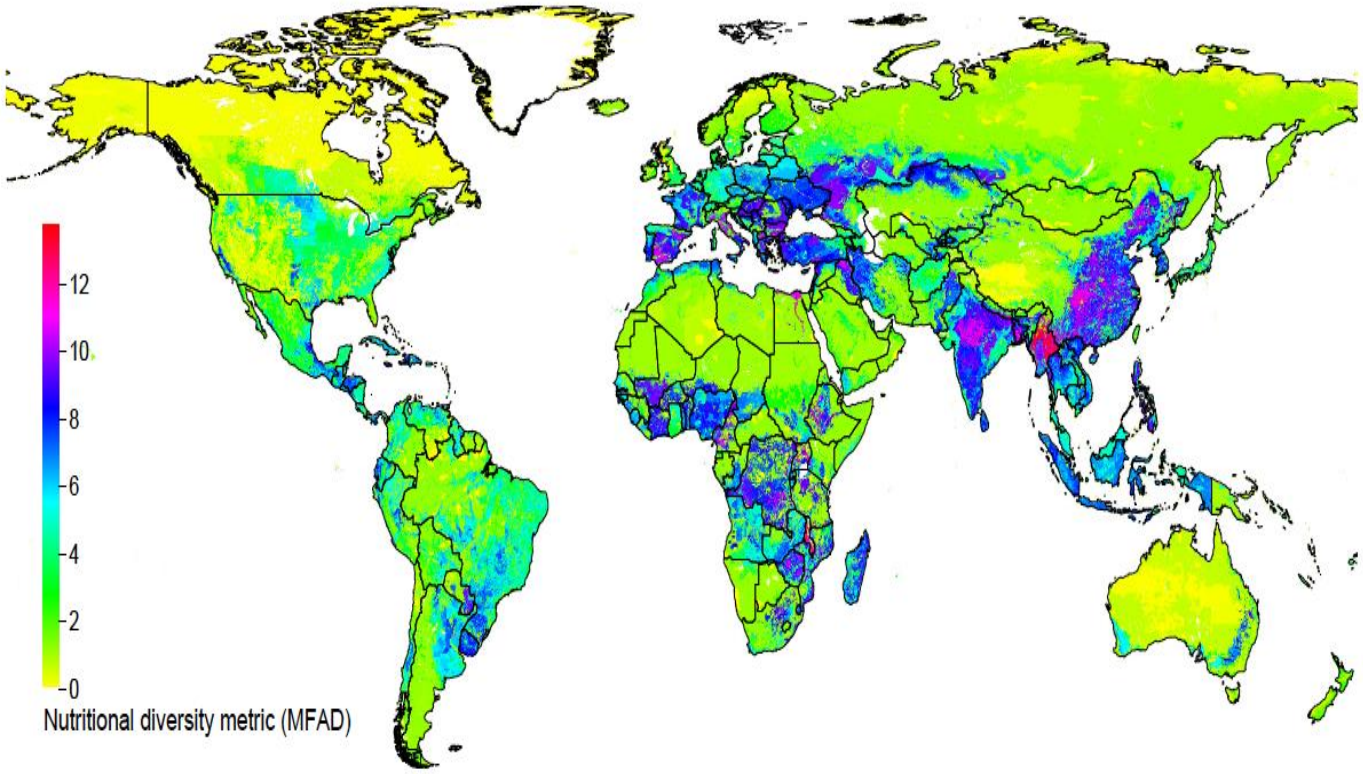
Our World in Data

Source: Vincent Ricciardi et al. (2018). How much of the world's food do smallholders produce? *Global Food Security*.

OurWorldinData.org – Research and data to make progress against the world's largest problems.

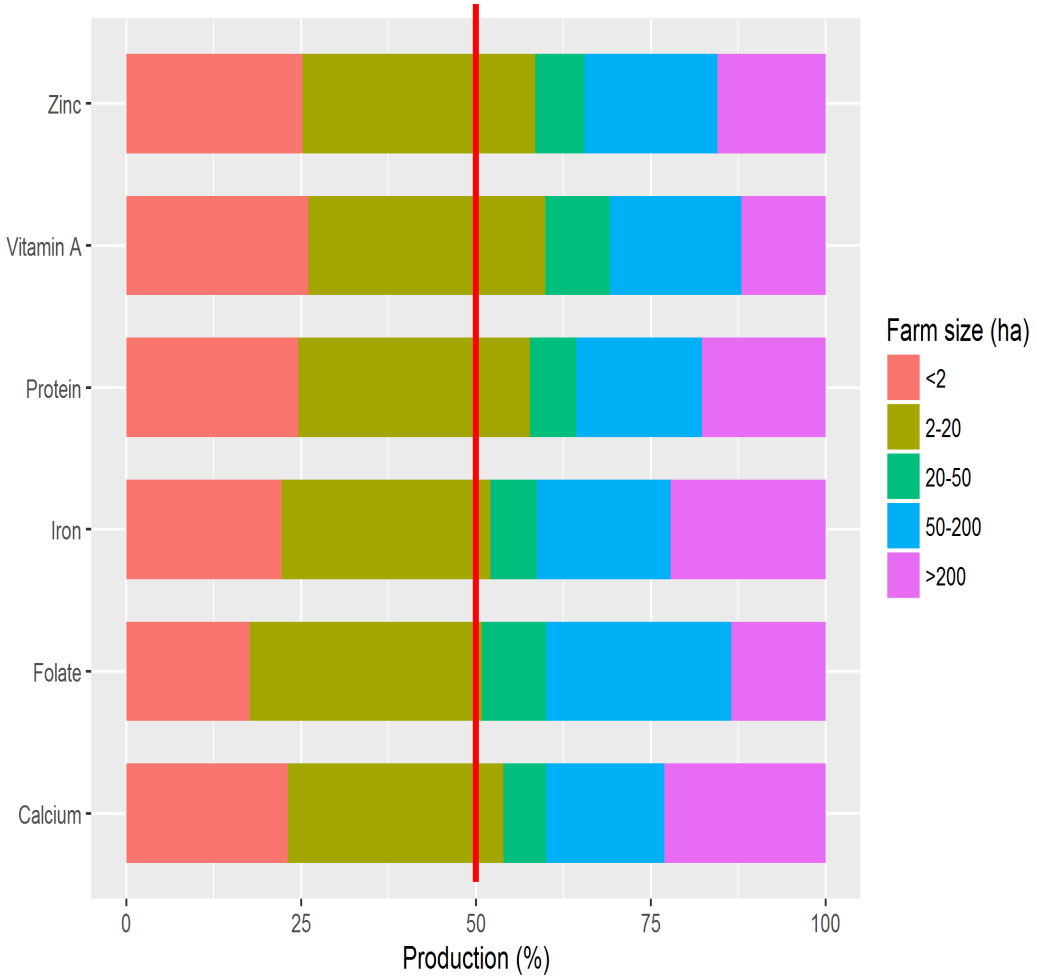
Small farm size: the key to production and nutrient availability in LMICs-SS Africa, SE Asia, S Asia & China

Higher diversity on small farms



Herrero et al Lancet Planet Health 2017

Farm Size (under 20 hectares) produce at least 50% of key nutrients



Biofortification:selection/develop staple crops with high micronutrients - One Piece of the Puzzle

Supplementation

Commercial Fortification

Agricultural intervention

Dietary Diversity

Source: H Bouis, HarvestPlus

Biofortification Works

- Nutrient levels can be increased to high enough levels in high-yielding backgrounds
- The extra nutrients are absorbed at sufficient levels that micronutrient status is improved
- Encouraging evidence that farmers will adopt and consumers buy/eat in sufficient quantities
- Biofortification is being mainstreamed

Source: H Bouis, HarvestPlus

Release Dates for Crops for Africa & Asia

Sweetpotato

Vitamin A Uganda

Cassava Vitamin A

Nigeria & DRC

Beans Iron

Rwanda & DRC

Maize Vitamin A

Zambia

Pearl Millet Iron

India

Rice Zinc

Bangladesh

Wheat

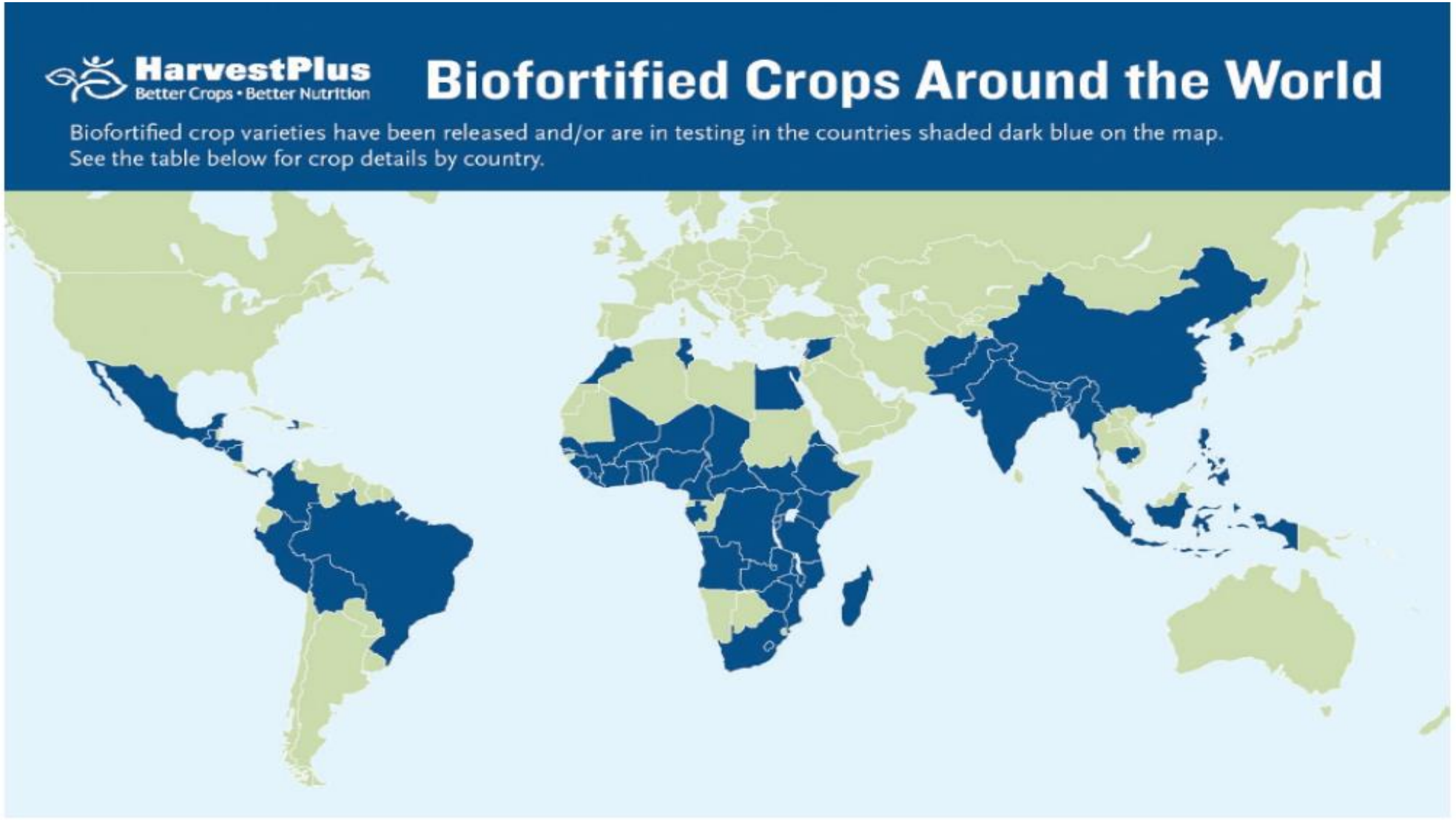
Zinc

India |

Pakistan 2015

Source: H Bouis, HarvestPlus

>340 biofortified varieties of 12 crops released or in testing in Africa (37), Asia (11), Latin America/Caribbean (15)



CAST- Issue Paper #69 October 2020

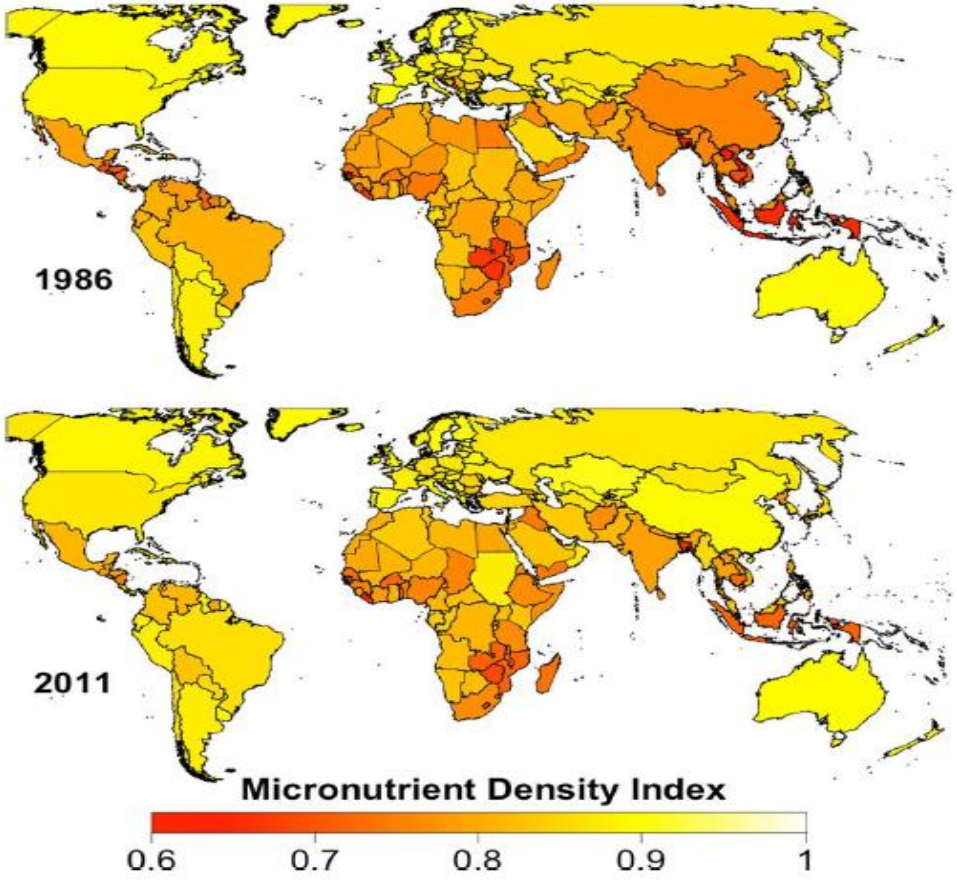
Biofortified crops: Nutrition/Health Benefits

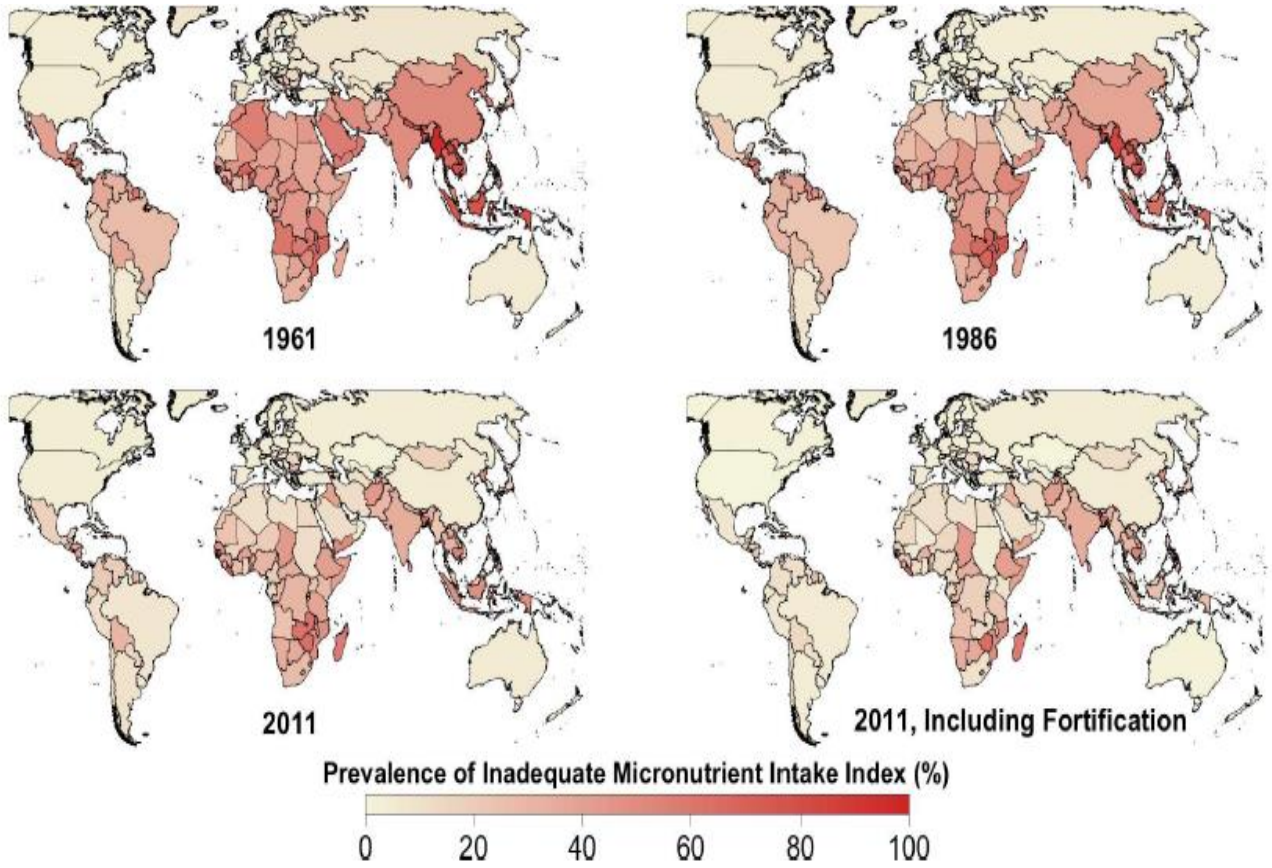
Research has confirmed a number of important health benefits from biofortified crops.

- **Vitamin A-biofortified crops** were shown to reduce vitamin A deficiency, improve night vision, and reduce the incidence of diarrhea—leading causes of morbidity and mortality in young children.
- **Iron-biofortified crops** were found to reverse iron deficiency and iron-deficiency related anemia, reduce fatigue in women, and improve cognitive and physical performance in women.
- **Zinc-biofortified crops** were shown to reduce susceptibility and duration of various illnesses in women and children, such as respiratory infections, inflammation, pneumonia, vomiting, and fever.

Source: HarvestPlus, Calls to Action 2021

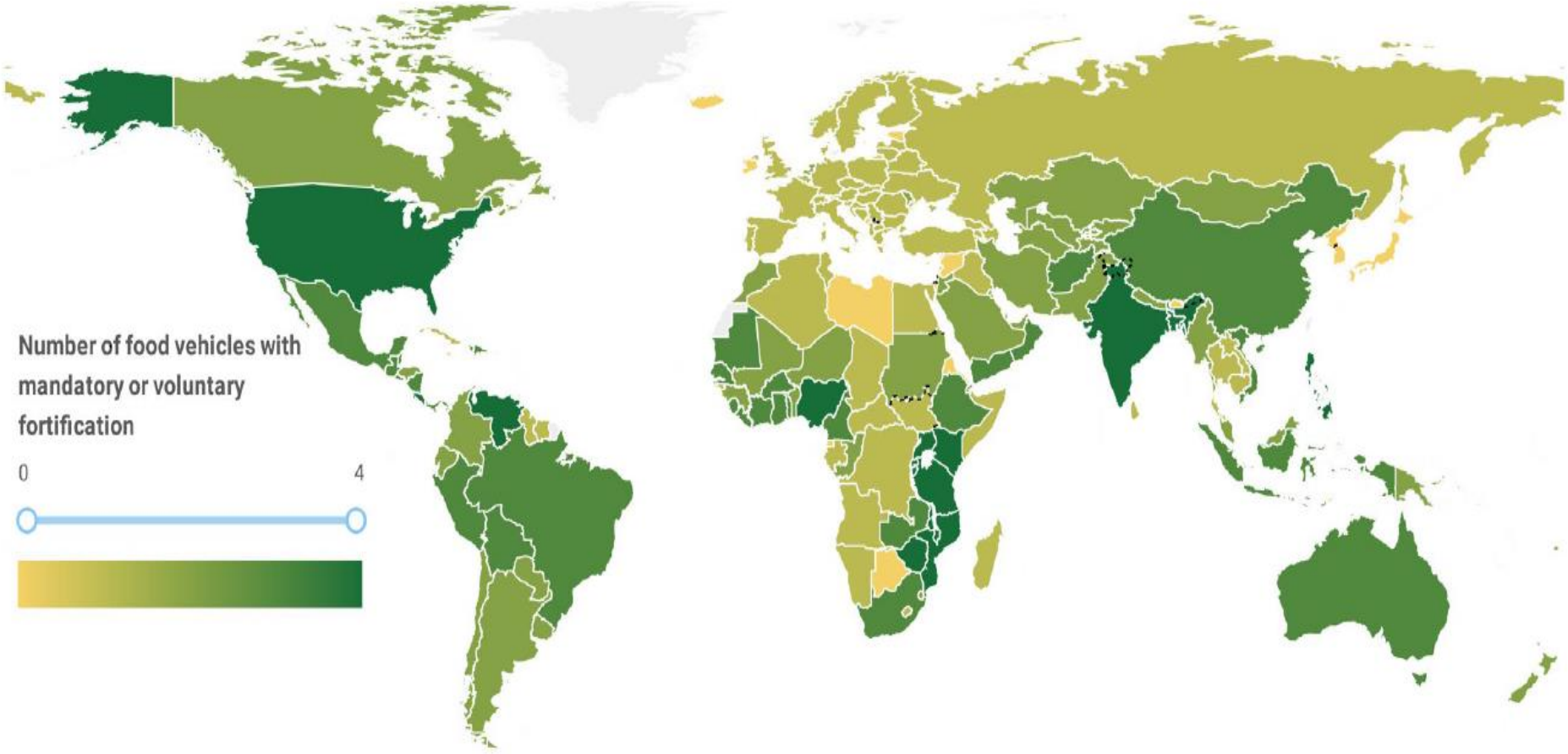
Country Index–Prevalence of Inadequate MN Intake improved with increased MN density in food supply and further reduced by food fortification; Macro/MNs of inadequate intake: calcium, iron, vitamin A, folate, zinc, riboflavin and B12





Beal T et al PLoS ONE 2017

Mandatory/voluntary fortification programs in countries eg salt-iodine, milk-vit D, flours/bread (vit Bs, iron), oil (vits A/D/K) etc



Source: Global Fortification Data Exchange 2020; Mkambula P et al GAIN Discussion Paper#10, 2022

LSFF in LMICs: improved MN status/health outcomes
Systematic Review and meta analysis

LSFF-VA protects 3M children/yr

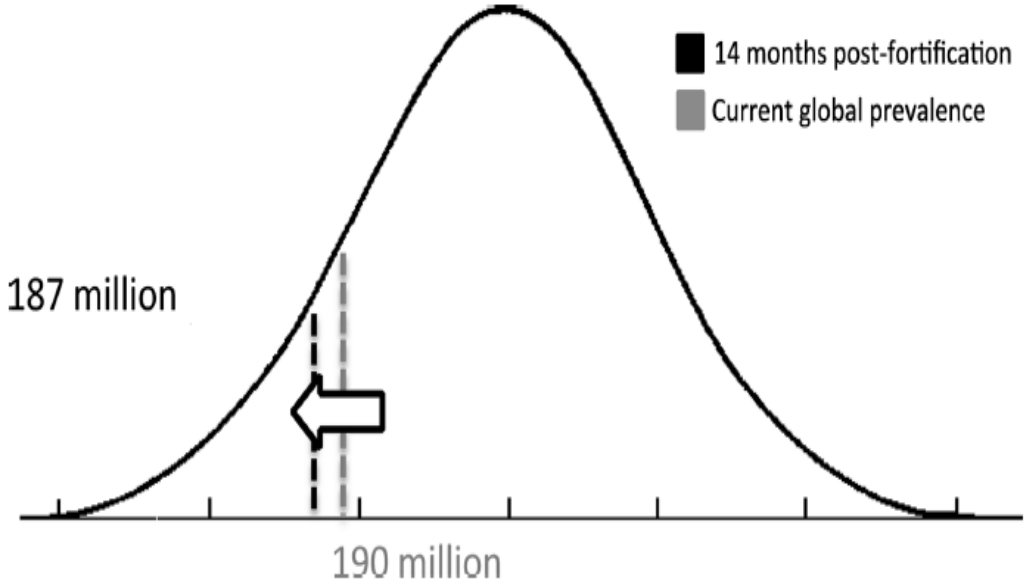


FIGURE 2 Change in distribution of global vitamin A deficiency (serum retinol <70 μmol/L) in children (0–9 y) after 14 mo of LSFF with vitamin A. LSFF, large-scale food fortification.

LSFF w Micronutrients

- Increased serum MNs
- LSFF-iron: 34% reduction in anemia
- LSFF-iodine:74% reduction in odds of goiter
- LSFF-folate: 41% reduction in odds of neural tube defects

Ref: Keats et al AJCN 2019

Food fortification across life stages: potential benefits- high in WRA, Adult and the Elderly

	Pregnancy	Lactating mother	6–23 mo	2–5 years	5–18 years	WRA (15–49 years)	Adult men	Elderly
Micro-nutrient need	very high	very high	very high	high	moderate to high	moderate to high	low to moderate	moderate to high
Amount of food eaten	moderate	moderate	low	low, increasing with age	increases with age	moderate	high	moderate
Potential to benefit	high	high	low	low, increasing with age	increases with age	high	high	high
Potential to fully meet need	low	low	no	low, increasing with age	increases with age	high	high	high

Figure 1. Potential benefits of food fortification across the life cycle. Source: Irizarry, L, Prost, MA, Murillo, D, Lopez de Romaña Daniel et al. 2017. Scaling Up Rice Fortification in Latin America and the Caribbean. World Food Programme and *Sight and Life*: 2017. WRA = Women of Reproductive Age.

Olson R et al Nutrients 2021

Food vehicles fortified/biofortified with nutrients can reinforce each other while avoid excess

Food vehicle	Large-scale food fortification	Biofortification
Beans	-	Iron and zinc
Cassava	-	Vitamin A
Maize	Iron, Calcium, Zinc, Folic acid, Vitamin B12, Vitamin A, Zinc, Thiamine, Niacin, Vitamin B6, and/or Vitamin D	Vitamin A or Zinc
Milk	Vitamin A and/or Vitamin D	-
Oil	Vitamin A, Vitamin D, and/or Vitamin K	-
Pearl millet	-	Iron
Rice	Iron, Folic acid, Vitamin B12, Vitamin A, Zinc, Thiamine, Niacin, and/or Vitamin B6	Zinc
Sweet potato	-	Vitamin A
Salt	Iodine, Iron	-
Wheat	Iron, Calcium, Zinc, Folic acid, Vitamin B12, Vitamin A, Zinc, Thiamine, Niacin, Vitamin B6, and/or Vitamin D	Zinc

Mkambula P et al GAIN Discussion Paper#10, 2022

Key messages- Biofortification & LSFF at scale

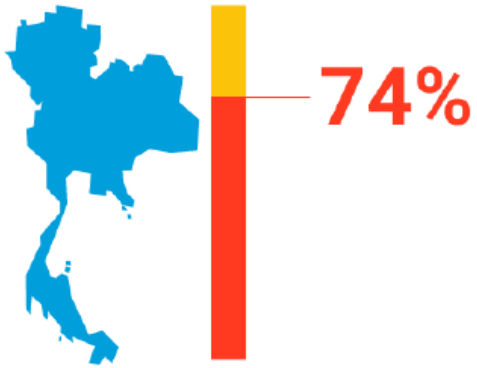
- Both proven to be acceptable, efficacious, cost effective, scalable interventions to improve nutrient intakes and health outcomes
- Bringing both interventions to scale → enriched multiple food vehicles → fill gaps of nutrients-coexisting defs → reach different target populations
- By enriching broadly consumed staples and condiments, food systems can be transformed without calling for changes in consumer's behavior or significant costs to consumers, producers/manufacturers

Mkambula P et al GAIN Discussion Paper#10, 2022

Burden of NCDs

400,000 lives lost annually to NCDs

90% of all who died of COVID had an underlying NCD



74% of all deaths in the country due to NCDs

THB 1.6 trillion annually or 9.7% of GDP estimated as lost to NCDs.

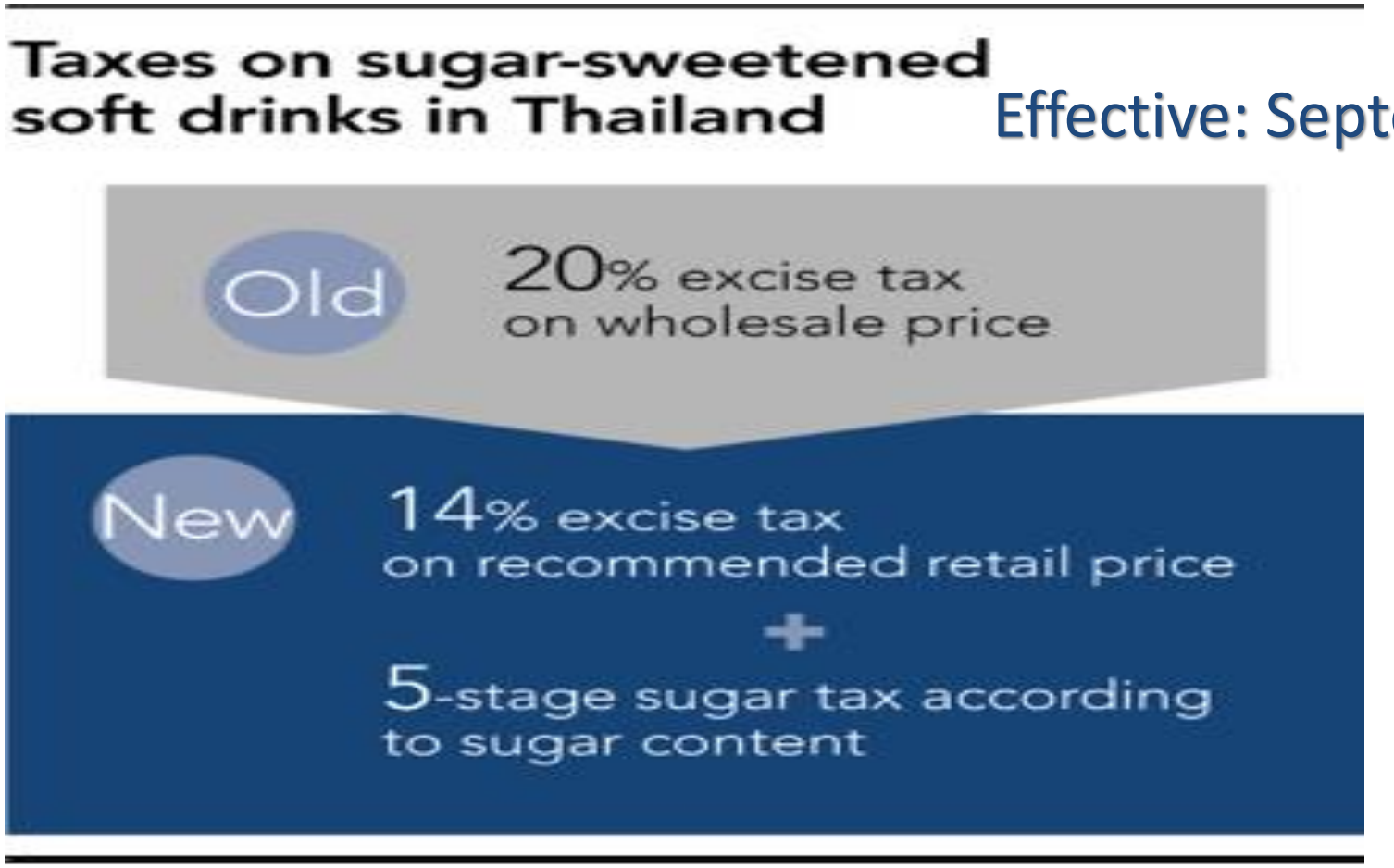
4% to 20% increase in adolescent obesity from 2008 to 2021

United Nations Thematic Working Group on Noncommunicable Disease Prevention and Control: case study – Thailand 2021

Rationale for Sugar Sweetened Beverage (SSB) Tax in Thailand

- Sugar intake of 25 tsp or 100 g/d --exceeds WHO Recommendation (6 tsp or 25 g/d)
- Among foods, largest source of sugar consumption – SSB; 24% population at least one serving SSB/d; rising popularity in school children/adolescents
- Increasing health problems related to sugar consumption: Obesity (major risk factor of NCDs), Diabetes, Hypertension, Cardiovascular Disease and Dental Caries.
- SSB taxation recommended by WHO as one of the 'best buy' interventions to prevent overweight and obesity
- Influenced by key Health Actors: the Sweet Enough Network (reduced sugar intake campaign), Thai Health Promotion Foundation (funded by 2% alcohol/tobacco tax – communication, advocacy, policy/program research), and International Health Policy Program (evidence-informed policy)

Urwanachotima N et al BMC Oral Health 2020; Phonsuk P et al PLOS ONE 2021; WHO Technical Meeting Report 2015



Specific tax rate: > 18 g/100 ml highest, < 6 g/100 ml zero; grace period of 2 yr X 3; tax rate to increase every 2 yrs until 2023; SSBs- carbonated soft drinks, fruits/veg juices, coffee/tea, energy drinks, beverage concentrates (vending machine).

Thailand Excise Act BE 2560 – reformulation of excise tax –September 2017

Post SSB Tax- Consumption changes?

- Analyze taxed vs non-taxed SSB consumption at population level
- A cohort study – natl representative of 6 yrs and older, total 5,594 persons during 2018 vs 2019

Key findings

- Significant reduced consumption in taxed vs non-taxed SSB
- For taxed items, reduction *largest in carbonated & herbal drinks* carrying higher prices
- SSB tax deterred consumption among older persons, lower income groups and unemployed but not those w higher income/education

Next: decline in consumption sustained or not?; any impact on health problem?; to review threshold of tax-tiered structure for desirable outcomes/impact

Ref: Phulkerd S et al Nutrients 2020

Modeling Impact of SSB Tax in Thailand

Overweight/Obesity

- Applying 11 (existing), 20, 25% price increase to the model reduces SSB consumption by 14, 26, 32%; the decline in obesity prevalence of 1.73%, 3.83%, 4.91%

Recommendation: new excise tax structure of SSB to 20 or 25%

Dental Caries

- Simulation model – current SSB tax policy reduces prevalence of dental caries by only 1% in 2040. *Issue raised: majority sugar consumed from non-tax sugary foods/beverages under 'street foods culture'*

Recommendation: combine SSB Tax with comprehensive public health policy aimed to reduce total sugar intake from non-SSB sources

Urwanachotima N et al BMC Oral Health 2020; Phonsuk P et al PLOS ONE 2021

Key Messages

Policy Implications to address all forms of malnutrition & NCDs

- Consumer-focused food systems to mainstream nutrition across supply chains-food environment-individual choices/consumption
- A whole-of-system coordination: CONNECT food systems with health, social protection, education, WASH, women/climate agenda

Research/evidence

- R&D on 'affordable' healthier foods/products, effective behavior change
- Implementation Research to guide the best of 'How'
- Data system – link monitoring/evaluation to existing surveillance routine for evidence-informed policy