

Nutrition as a Basic Need

A new method for utility-consistent and nutritionally adequate food poverty lines

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Food Prices for
Nutrition 

Motivation

- The World Bank estimates that about 9% (689 million) of the global population is \$1.90/day poor, but nutritionists estimate that 25% (2 billion people) suffer from micronutrient deficiencies
- Do standard poverty metrics poorly reflect nutritional needs?
- Most poor countries use the cost of basic needs approach for national poverty lines, estimating food baskets that satisfy a dietary energy standard while reflecting consumption patterns of poor households.
- But poor households consume poor diets. Lots of starchy staples, few nutrient-dense food ... a circular logic: cost of basic “nutritional” needs estimated from nutritionally inadequate diets.
- Herforth et al. (2020) and Hirvonen et al. (2019), compare least cost healthy diets to household food expenditure and show that across LMICs healthy diets are out of reach for large shares of the population – do not capture households’ ability to move consumption-expenditure between food and nonfood
- Allen (2017) uses linear programming to generate nutrient-adequate food poverty lines
- Neither approach reflect food preferences, cultural food norms



Contributions

- We argue that:
 1. A healthy diet *is* a basic need and should replace the energy standard in costing basic-needs food poverty lines
 2. A healthy diet can be defined from food-based dietary guidelines (national policy documents), but adjusted to to reflect context-specific dietary patterns
 3. Poverty estimates resulting from poverty lines that use energy-based food baskets is likely to be much lower than poverty based on a healthy-diet food baskets, and energy-based food baskets are associated with significant micronutrient deficiencies
- We apply these arguments to Myanmar (2015) but expect that our results generalize to all LMICs.
- In short, nutrition as a basic need implies that the world is poorer than we think



Concepts & Methods



Poverty measurement: Do households achieve a minimum level of wellbeing?

How do we define wellbeing? How do we quantify it?

Welfare → utility defined over commodities and reflecting the preferences of poor/near poor households

Cost of Basic Needs reference utility: a consumption bundle that allows individuals to

“lead a healthy and active life, including fully participating in the society” (Ravallion, 1998)

preferences

Consumption patterns of
poor/near poor households
observed in household
survey data

healthy & active life

Nutrition standard
Essential non-food
expenditures
(consumption choices)

social inclusion

Cultural norms & socially
necessary consumption
(consumption choices)

poverty line = reference utility consumption bundles evaluated at prices faced by poor/near poor HHs
= food poverty line + non-food allowance

Nutrition standard: energy-based vs healthy diet food poverty lines

Energy-based food poverty line

Food consumption by relatively poor households evaluated at median prices and scaled to meet a dietary energy target

Healthy diet food poverty line

- Food based dietary guidelines – policy documents defining diets that meet nutritional needs
- Cost and Affordability of a Healthy Diet now reported by FAO as global food security indicator, reflecting “economic access to nutritious food to meet dietary needs for an active and healthy life”
- Food consumption by relatively poor households evaluated at median prices where

food groups are scaled to meet food group quantities specified in dietary guidelines

relative shares of foods within each food group are fixed (reflects consumption patterns)

total food basket is scaled to meet the dietary energy target



Minimum cost linear programming diets and the FAO’s minimum “cost healthy diet” indicator do not incorporate consumption patterns that reflect preferences.



Being classified as non-poor in terms of a healthy diet is distinct from consuming a healthy diet.

Utility consistent regional poverty lines

Tension between two principles used in estimating poverty lines

Utility consistency:

poverty lines should represent the same reference utility level across time and space

Specificity:

poverty lines should reflect local conditions – relative prices, availability, norms

Arndt and Simler – method for estimating utility consistent regional poverty lines

Regional food poverty lines

Estimate regional food poverty lines based on regional consumption patterns and nutrition target

Revealed preference theory

Identify inconsistencies in utility levels across regions by testing revealed preference conditions

Cross entropy criterion

Enforce revealed preference constraints while preserving, to the greatest degree possible, the information content of the initial food poverty baskets

Myanmar case study

Regional variation in diets – important consequences for poverty measurement

- diverse climates, agro-ecologies, and ethnic traditions affect diets

2015 Myanmar Poverty Living Conditions Survey LSMS style survey (MoPF and World Bank, 2017)

- nationally representative household survey
- 7-day recall of 154 food items

Sub-national poverty line regions

	Number of households	Number of relatively poor households: energy-based poverty	State/Regions
Hills and Mountains	720	240	Chin, Kachin, Kayah, Kayin, Shan
Dry Zone	720	181	Magway, Mandalay, Nay Pyi Taw, Sagaing
Delta	720	231	Ayeyarwaddy, Bago, Mon,
Coastal	720	162	Rahkine, Tanintharyi
Yangon	768	311	Yangon
Total	3,648	800	

Food based dietary guidelines for Myanmar

Food Groups	Average number of servings	Serving size (grams)	Recommended average quantity (grams)
Starchy staples	11	30	330
Pulses	1.5	30	45
Meat/Fish/Eggs	2.5	40	100
Dairy and substitutes	1.5	150	225
Dark green leafy vegetables	1.5	100	150
Other vegetables	3	100	300
Fruits	2	100	200
Fats	4.5	7	30
Discretionary foods	5	5	25

Adapted from the Food Based Dietary Guidelines for Bangladesh (Nahar et al., 2013).

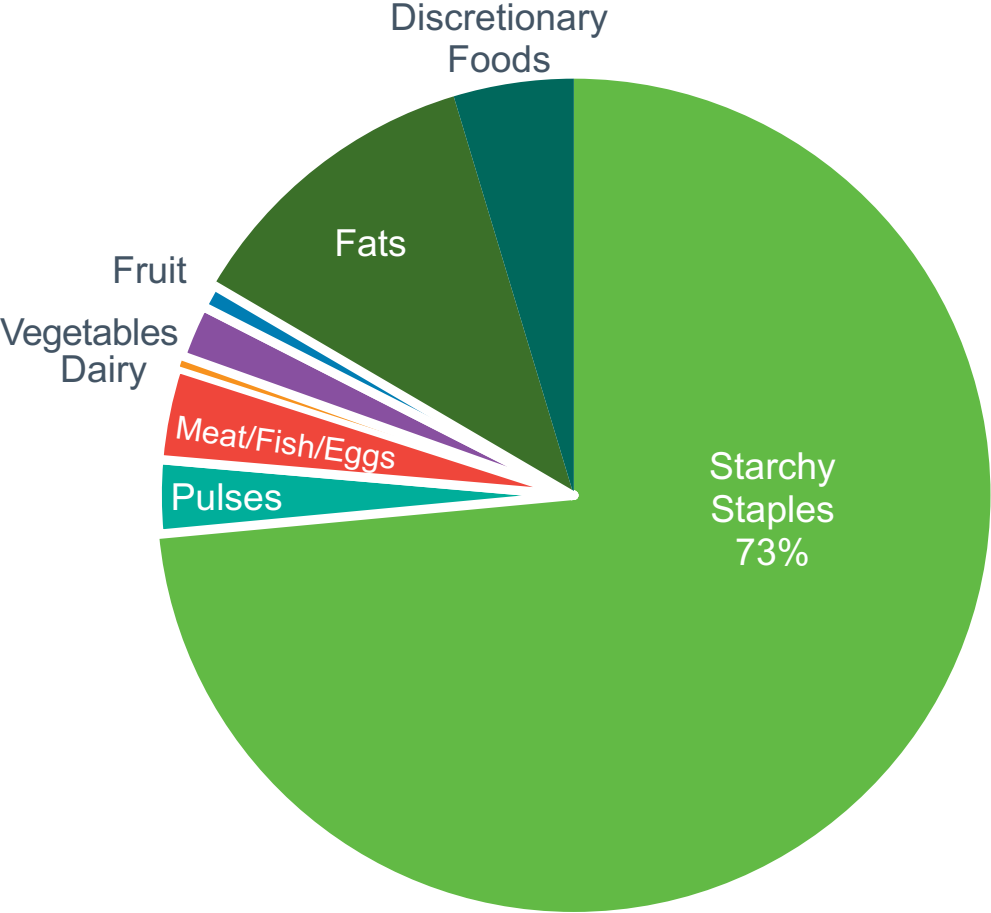
- Myanmar does not have completed, quantified guidelines for the general population
- Use neighboring Bangladesh's guidelines
- Low dairy consumption and widespread small fish/crustation availability and consumption
 - dairy food group adapted to include calcium-rich small fish and dried crustaceans
- Average quantities correspond well with an adult women's energy needs (kcal)



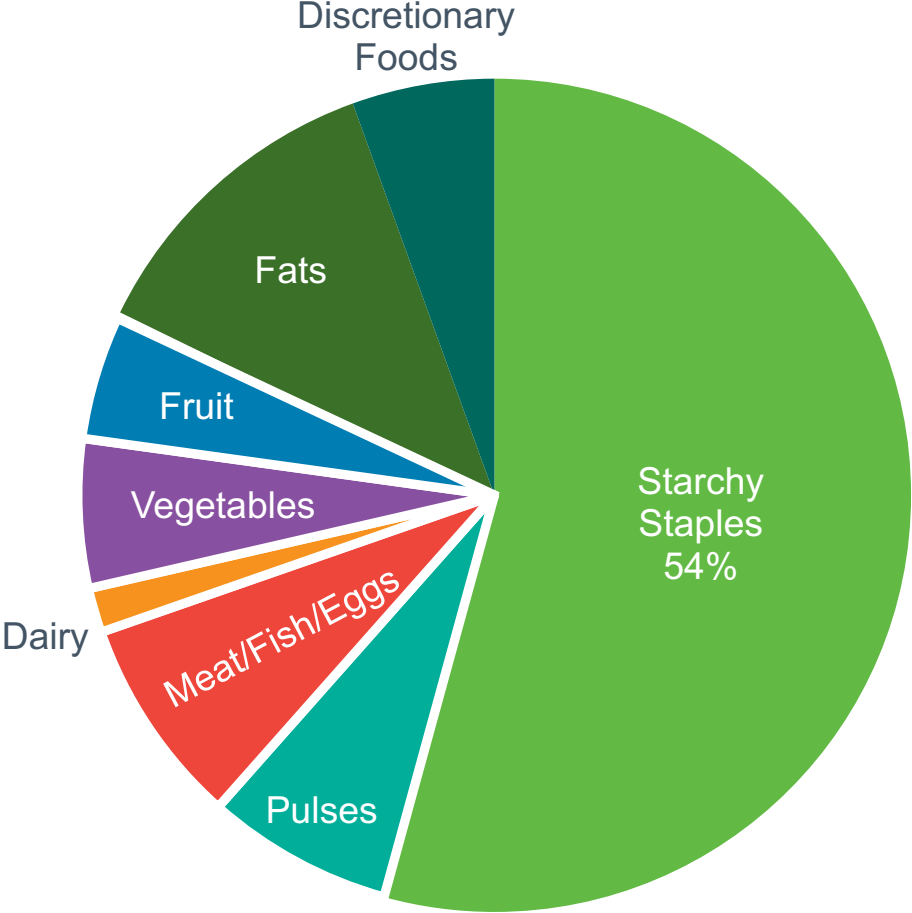
Results

Food basket energy shares

Energy-Based

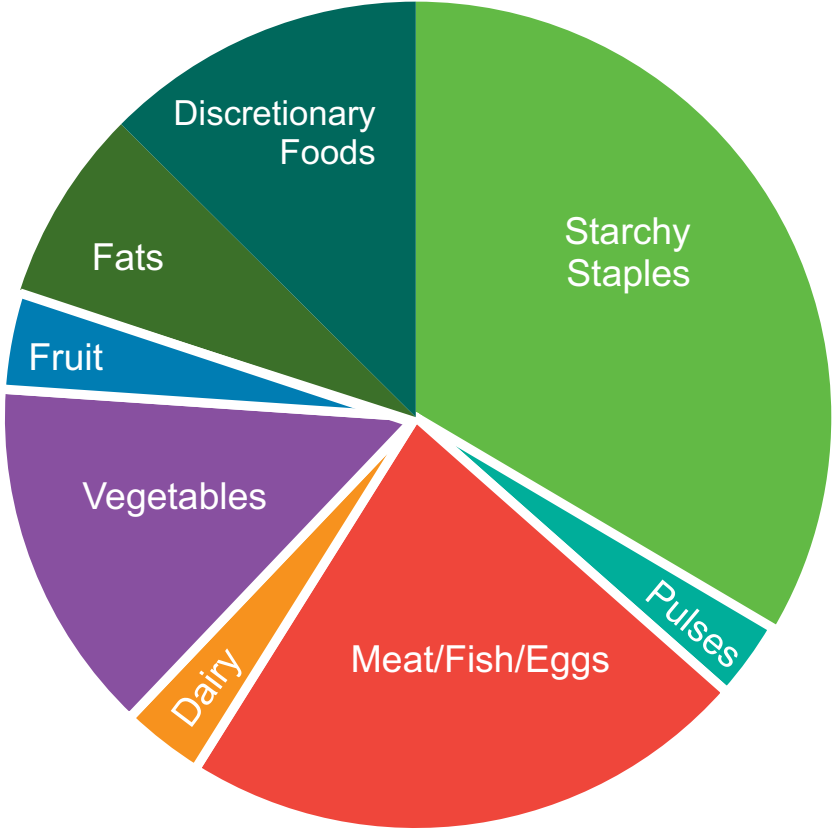


Healthy Diet

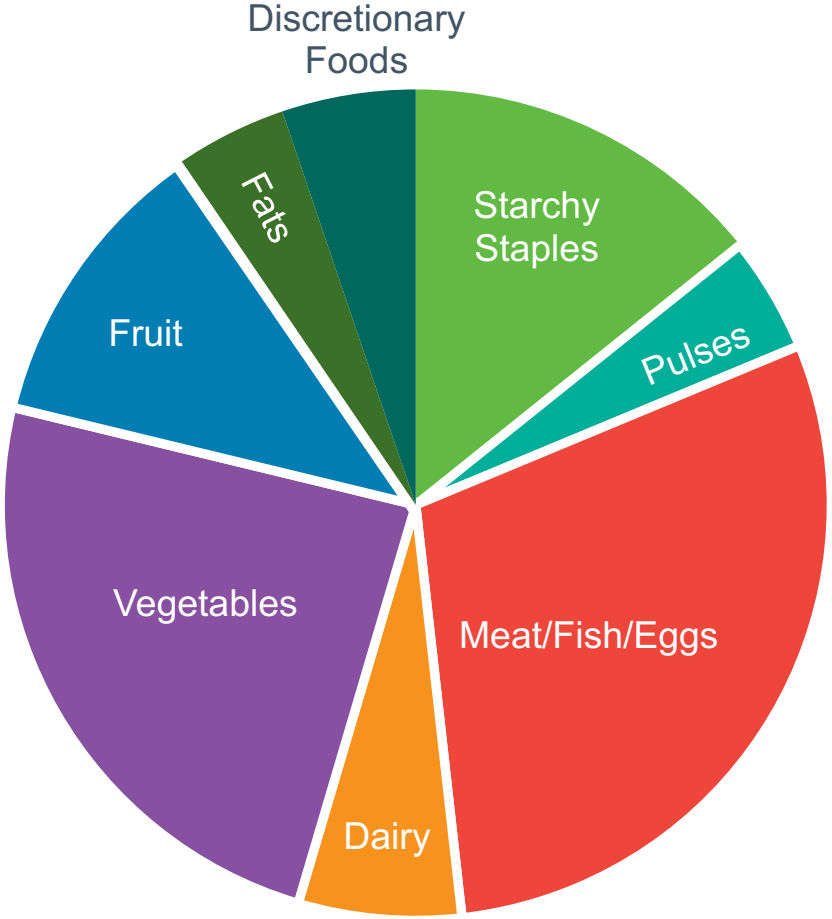


Food basket cost shares

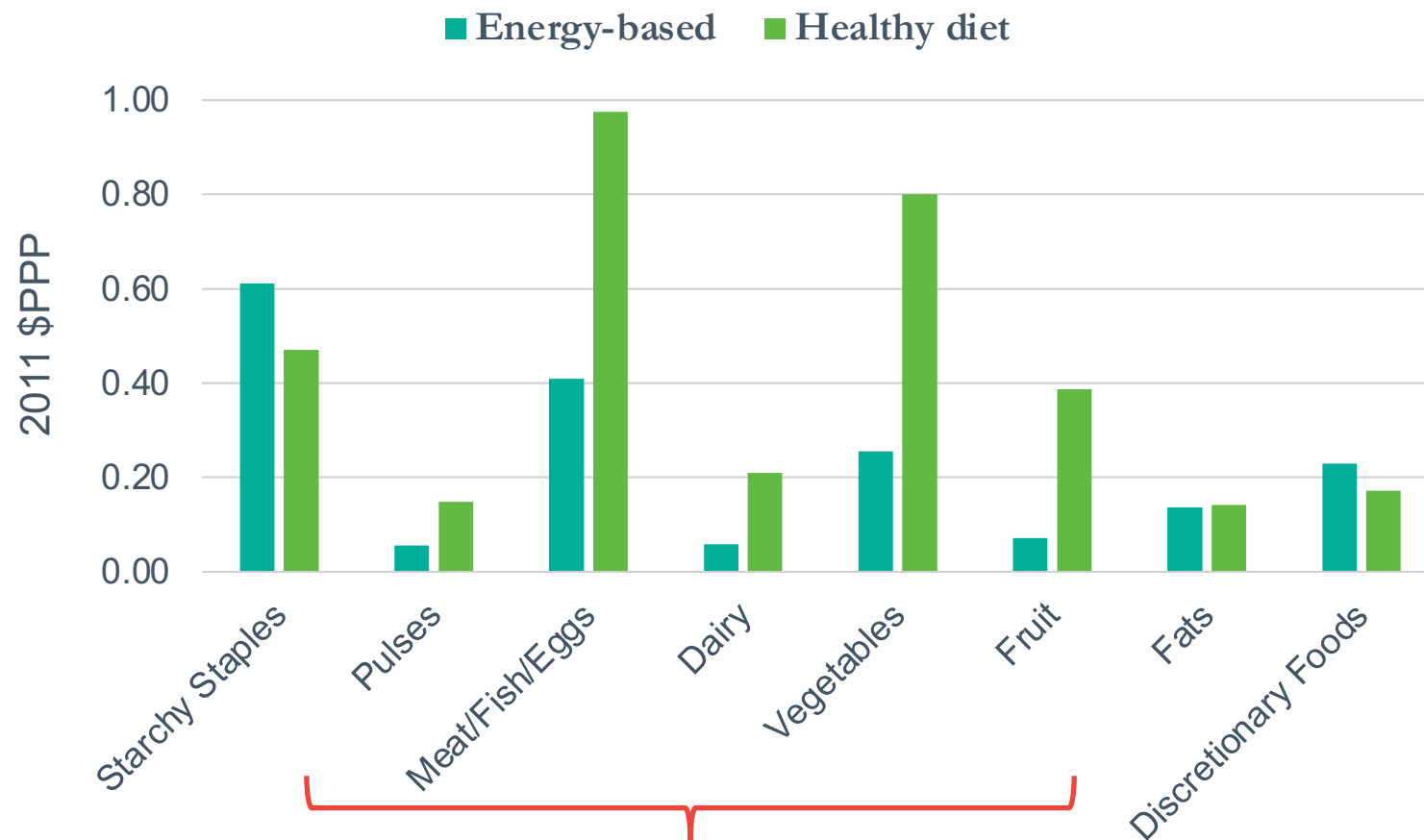
Energy-Based



Healthy Diet

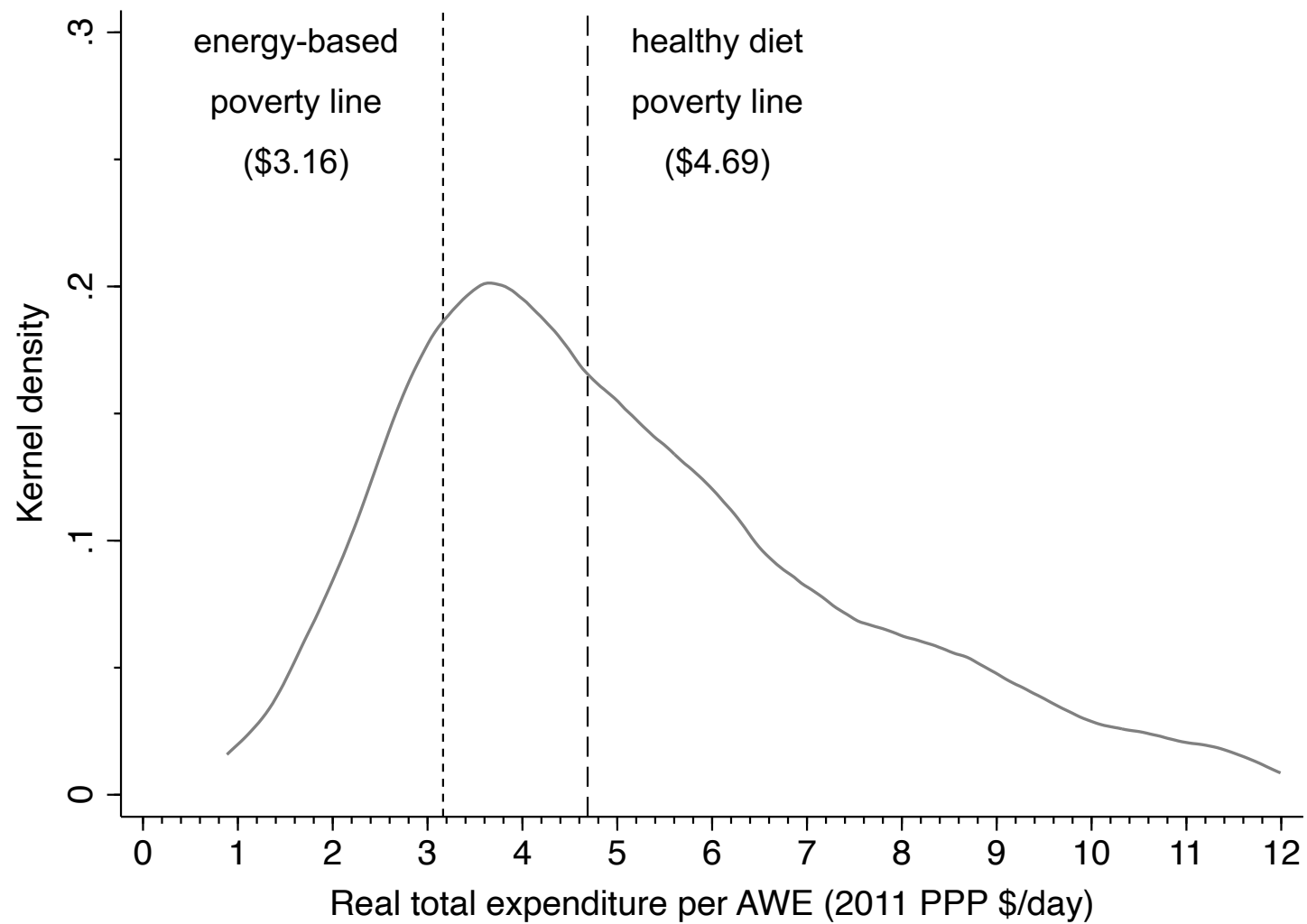


Food group basket costs



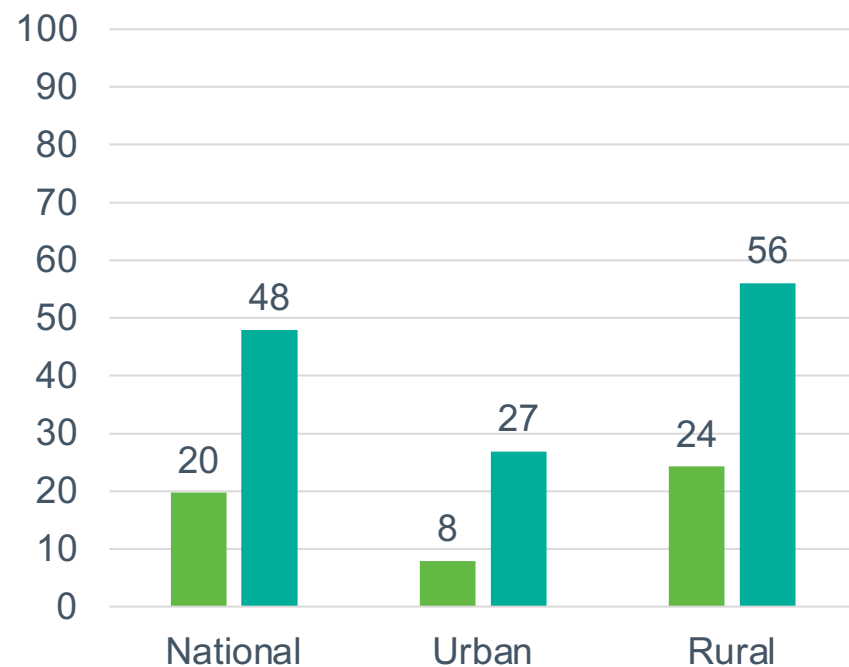
- Energy-based and healthy diet baskets are both aligned with consumption patterns of poor households and the energy target.
- Healthy diet baskets are also aligned with healthy diet guidelines.

Distribution of total expenditure

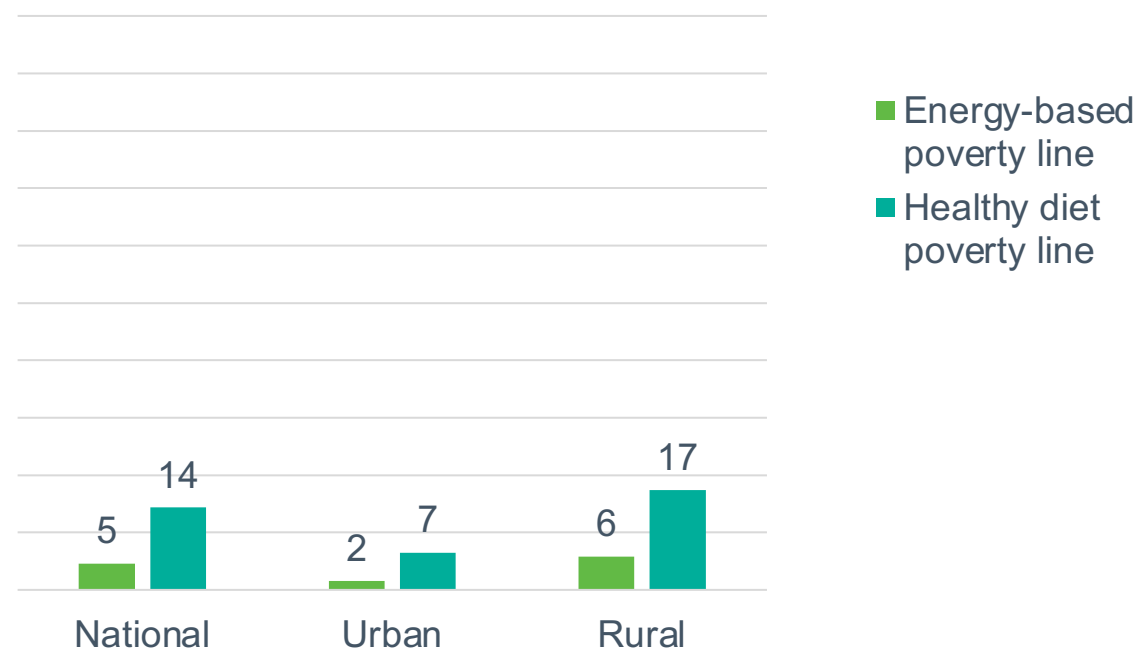


Poverty

Poverty Rate
(% of population)



Depth of poverty
(poverty gap as a % of poverty line)



Nutrient adequacy of each basket

% of EARs for a 30-year old woman

	EAR	Energy-based	Healthy diet
Protein, g	33	152	207
Calcium, mg	750	48	110
Iron, mg	11	100	136
Magnesium, mg	265	89	137
Phosphorous, mg	580	132	172
Zinc, mg	9	85	105
Copper, mg	1	200	266
Vitamin C, mg	80	62	212
Thiamin, mg	0.9	79	119
Riboflavin, mg	1.3	47	82
Niacin, mg	11	105	128
Vitamin B6, mg	1.3	95	130
Folate, µg	250	71	166
Vitamin B12, µg	2.0	52	146
Vitamin A, µg RAE	490	56	136

EAR: nutrient intake that satisfies the needs of half the healthy individuals in a specified age-gender group

Nutrient assumptions outlined in the paper.

EAR (estimated average requirements) obtained from Allen et al. (2020).

Various food composition tables: Stadlmayr et al. (2012); Shaheen et al. (2013); Institute of Nutrition (2014); MEXT (2015); USDA (2016); Scott (2019).

Summary

The energy based-standard typically used to define food poverty lines

- Results in a basket severely deficient in most essential nutrients
- Undercounts the share of the population able to meet basic needs

The healthy diet standard

- Generally, meets nutrient needs while aligning with foods typically consumed
- Satisfies the long-standing aim of the cost of basic needs approach, as a standard within which it is possible for people to **“lead a healthy and active life, including fully participating in the society”**
- Follows the cost of basic needs’ use of consumption patterns to reflect preferences
 - in contrast to minimum cost linear programming diets or the “cost of a healthy diet”
- In countries with national food based dietary guidelines, aligns with established national policy
- Aligns with an internationally recognized food security indicator recently adopted by FAO
“cost of a healthy diet”

Conclusions



Discussion

Limitations

- Would people shift consumption to different items if they were trying to limit costs?

Implications

- Many more people should be counted as poor, if the standard accounts for the cost of healthy diets as opposed to just dietary energy.
- Using the healthy diet standard helps to explain the large disconnect between poverty and malnutrition rates
 - Affordability is just one barrier to eating healthy diets.
 - Availability, accessibility, and desirability are also driving factors in diets.
 - However, if people cannot afford to eat healthy diets, difficult to argue that their basic needs are met.

Thank you!

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