

# Adaptation & Validation of an Experience-Based Measure of Household Food Insecurity in Urban Slums of North India

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Views are those of the author's and may not be attributed to the Economic Research Service or the U.S. Department of Agriculture



**INDIA: 1.2 Billion; 31% Urban**



**97**

**MILLION**

**Urban Poor**

# INDIA'S URBAN POOR



**54%** Under-fives chronically undernourished

**HFI** → Chronic Undernutrition

**No** large-sample sized city-level data on experiential HFI

# Objectives

- Assess experiential HFI in slum of a medium-sized Indian city (1.4 million population)
- Identify HFI predictors
- Test the questionnaire's internal validity & reliability



# Methodology

- Household-based cross-sectional study (Oct'07-Mar'08)
- 75 randomly selected slums of Meerut city (1.4 million population; 0.65 million slum population)
- 40,016 married reproductive aged women
- 6-item short-form questionnaire developed by USDA<sup>1</sup> was used with two adaptations
- Statistical Analysis:
  - HFI predictors - binary logistic regression.
  - Internal reliability & validity - Cronbach's  $\alpha$  and Rasch-based item fit statistics.

# Methodology

- In last 12 months, due to lack of money, did you or any adult family member experience the following -

items in Short-form (6-item) Questionnaire	Items used in Present Study
<b>Could not eat a balanced meal</b> (Often True/sometimes True/Rarely True/Never True)	taken
<b>Bought food did not last for purchased period</b> (Often True/sometimes True/Rarely true/Never)	taken
Cut meal size or skip meal (Yes/No)	Merged and taken
<b>Cut meal size or skip meal</b> (Almost every month/some months but not every month/only 1 or 2 months)	
Ate less than felt was needed (Yes/No)	Omitted
<b>Hungry but did not eat</b> (Yes/No)	Re-worded as Slept Hungry

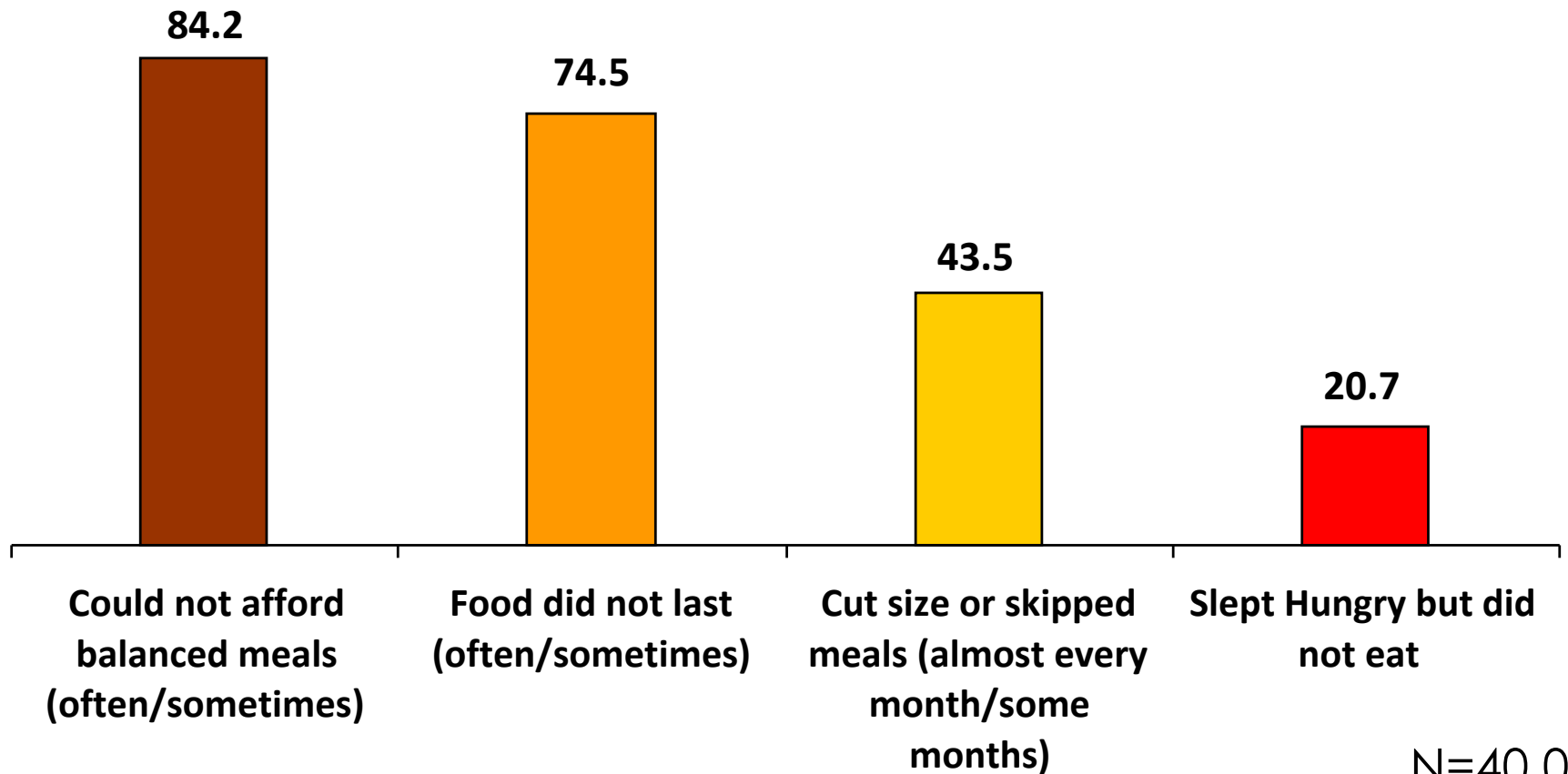
- Experiencing  $\geq 2$  Items often/sometimes = food Insecurity
- Experiencing  $\geq 3$  Items often/sometimes = Food insecurity with Hunger

Sometimes = 6 to 12 times in past year

Often = few times in most months or almost every month

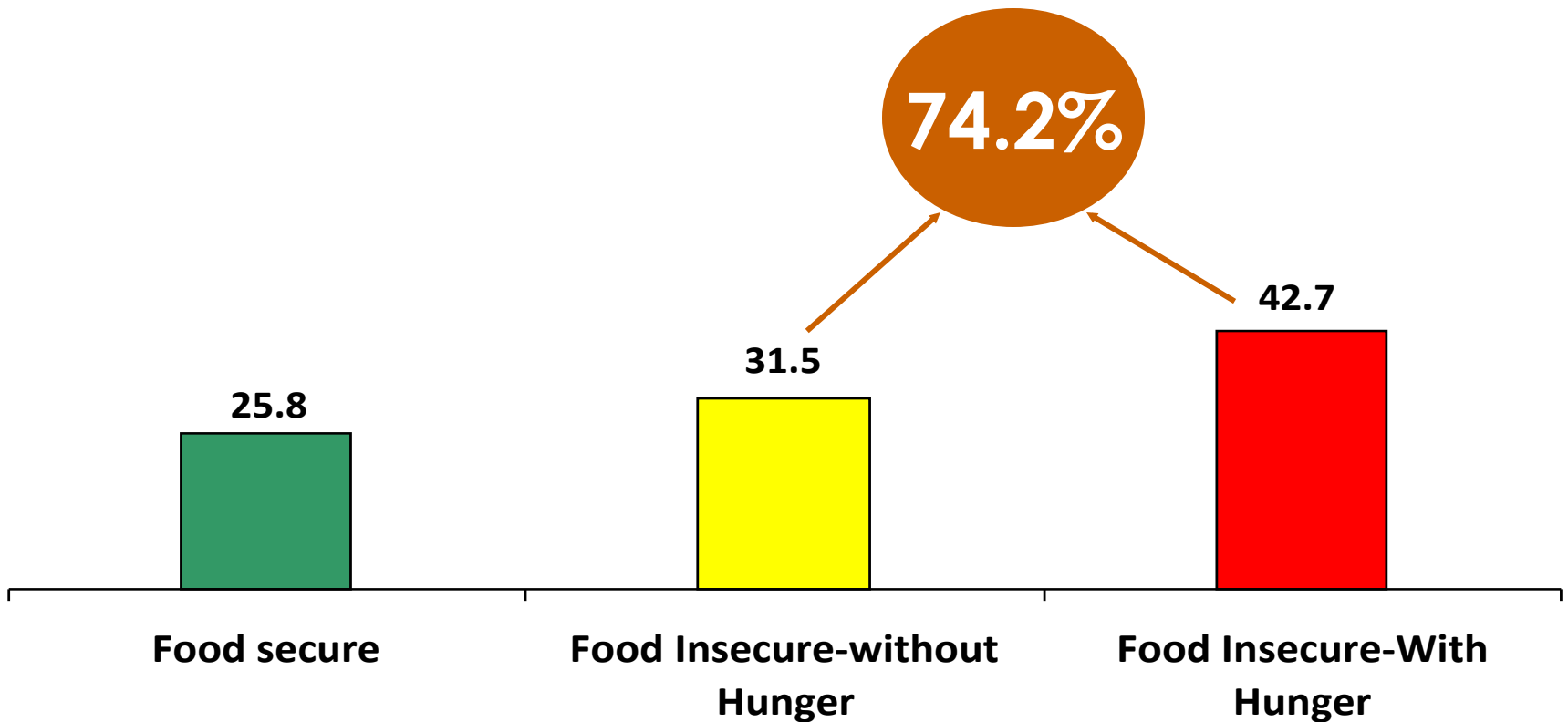
# Results

## 1. Affirmative Responses to Individual Items



# Results

## 2. Levels of Hunger & Food Insecurity



Food Secure: None or one affirmative response

Food Insecure-without Hunger:  $\geq 2$  affirmative responses

Food Insecure-with Hunger:  $\geq 3$  affirmative responses

N=40,016



# Results

## 3. Predictors

Independent variables	Adjusted Odds Ratio* (95% C.I.)	
	Food Insecurity with Hunger	Food Insecurity without Hunger
<b>Wealth Quintiles</b>		
Top two	0.00	0.00
Middle	2.1 (2.0-2.2)	2.7 (2.6-2.9)
Bottom two	4.1 (3.9-4.3) ↑	5.1 (4.8-5.5) ↑
<b>Caste/Social Group</b>		
Others	0.00	0.00
Lower Social Group <sup>#</sup>	1.3 (1.2-1.4)	1.5 (1.4-1.6)
<b>No. of people in household</b>		
4 or less	0.00	0.00
5-8	1.2 (1.1-1.3)	1.3 (1.2-1.3)
9 or more	1.3 (1.2-1.4)	1.3 (1.2-1.4)

<sup>#</sup> schedule caste/other backward caste

\* adjusted for religion, caste, wealth quintile, no. of children less than six years and no. of people in household

# Results

N=27,030

## 4. Internal Reliability & Validity

Item	Point biserial correlation	Item Severity Parameter (SE)*	Infit Statistics*	Outfit Statistics*
Could not afford to eat nutritious meal	0.46	-3.37 (0.03)	1.11	11.22
Food did not last and no money for more	0.58	-1.75 (0.03)	0.60	1.11
Cut meal size or skipped meal	0.59	1.14 (0.03)	0.52	0.63
Slept Hungry but did not eat	0.43	3.98 (0.04)	1.03	6.43
<b>Scale's Overall Reliability Coefficient (Cronbach Alpha (<math>\alpha</math>)) - 0.725</b>				

\*Item severity parameters and fit statistics were calculated using SAS-based programs developed by Mark Nord to implement Conditional Maximum Likelihood (CML) estimation methods.

# Conclusion

**1. HFI was 75% in slums. HFI → 4 times higher in bottom two wealth quintiles. Need to:**

- Link them to Poverty Alleviation Schemes
- Improve their access to Food Subsidy/Feeding Programs

**2. The 4 item HFI Scale has a good internal reliability & moderate internal validity.**

- To improve validity → expand back to 6 or 8 items
  - Split cut meal & skip meal items & their 'how often' options
  - Add "How often" follow-on question to the Hungry item
  - Using a 30-day recall