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The quality of a woman's diet & nutritional status is strongly associated with household food insecurity in rural in Nepal

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Background

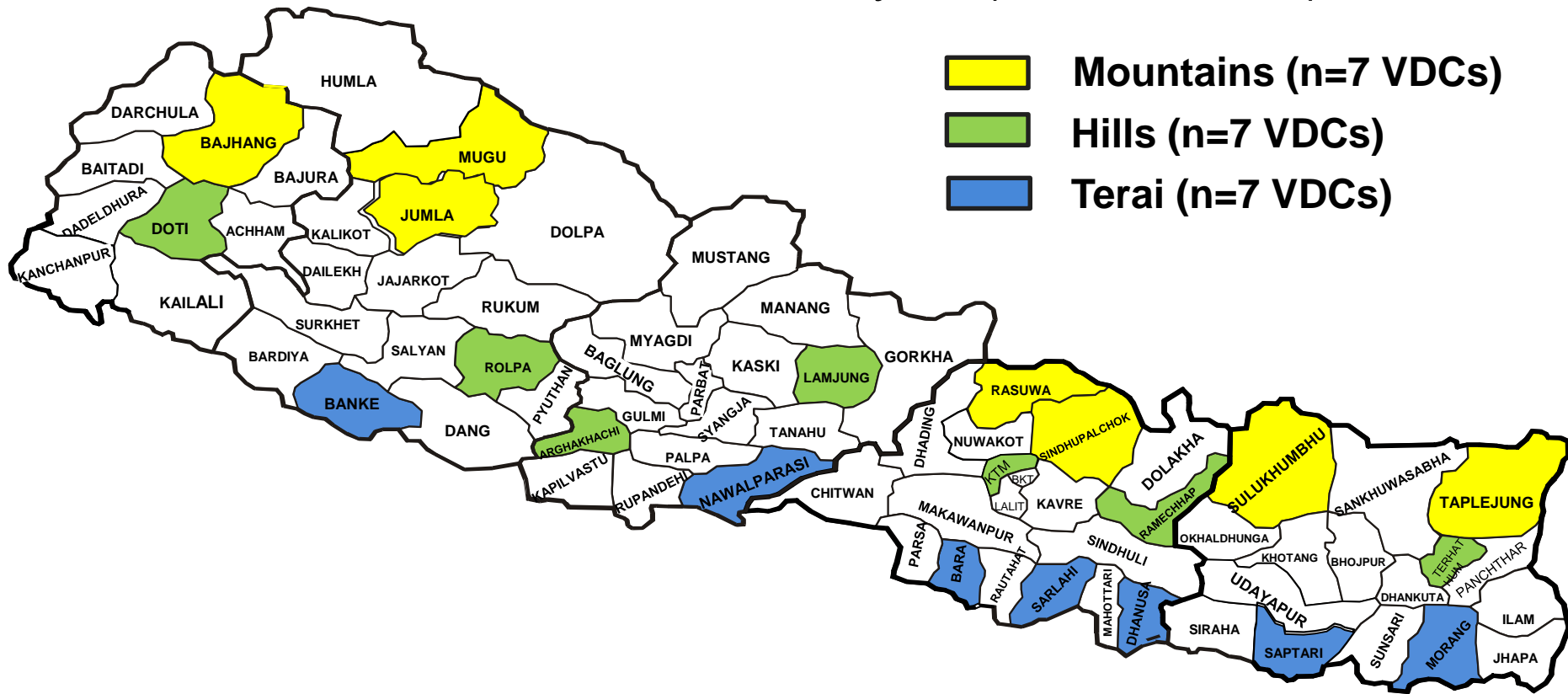
- Household food insecurity is considered a cause of chronic inadequate dietary intake and undernutrition.
- Reports exist of women compromising their own caloric intake and dietary diversity in food stressed environment to ensure adequate food for their husbands & children (Kramer et al, EJCN, 1997; Abdullah M, AJCN, 1985).
- Women of reproductive age (WRA) are nutritionally vulnerable. Inadequate intakes before & after pregnancy & lactation can lead to adverse health effects for both mother and infant.
- In poor & food stressed environments, dietary quality of WRA is poor and intake gaps exist for a range of micronutrients. (Arimond et al, J Nutr 2000; Lee et al, Publ Hlth Nutr, 2013)

Objectives

- Assess direction and strength of association between women's dietary intake and household food insecurity
- Assess direction and strength of association between women's nutritional status (as measured by MUAC and BMI) with level of household food insecurity

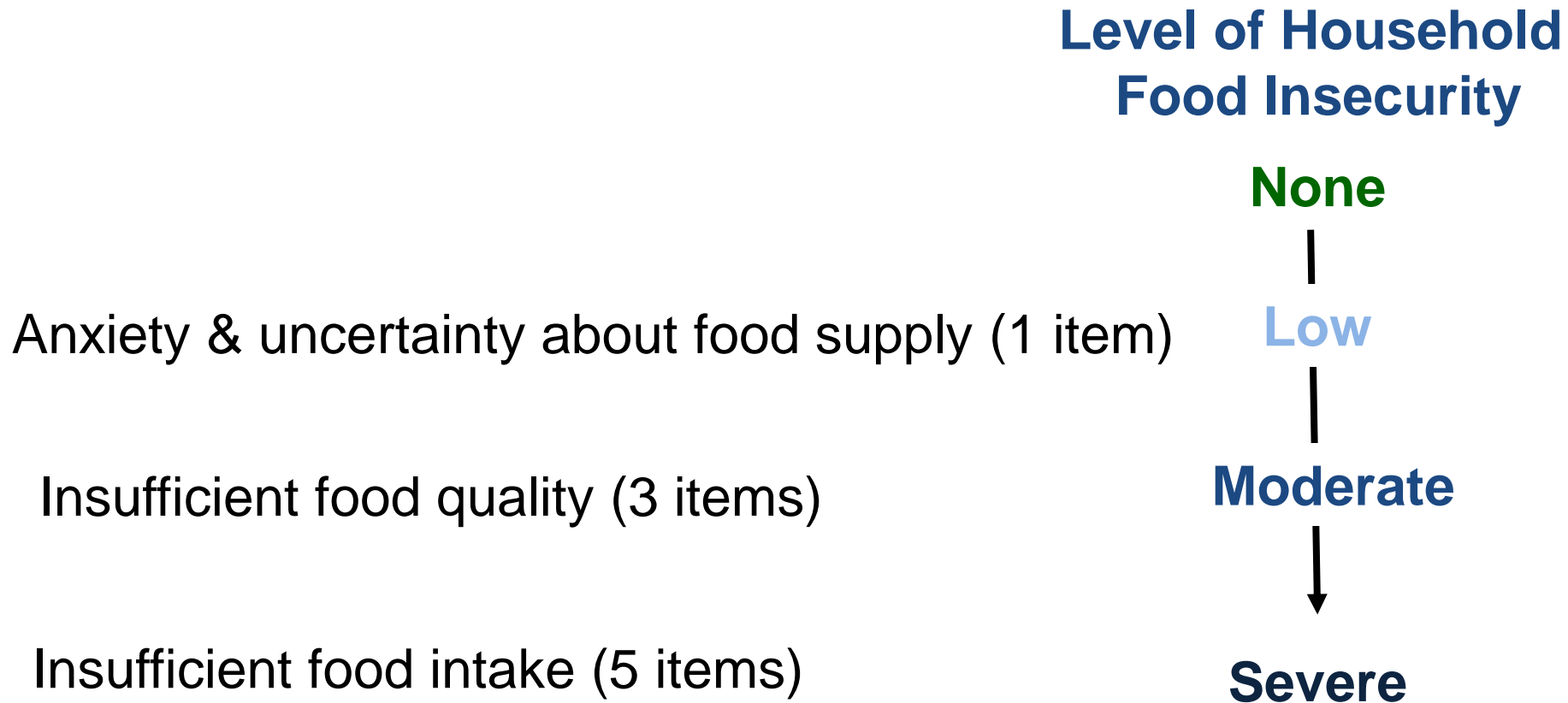
Study Population

- May-July 2013 panel survey, 21 districts, 63 wards, across mountains, hills and terrai
- Women of reproductive age (14-49y) including women with children <5y & newly married women
- N=4,469 women included in analysis (4% excluded)



Exposure: Household Food Insecurity

As measured by 9-item Household Food Insecurity Access Scale (HFIAS)



Outcome: Women's Dietary Intake

Derived from 49 item weekly food frequency:

- Mean **weekly** frequency of intake of each of 10 food groups
- Proportion consuming any food from each of 10 food groups
- Women's **Weekly** Dietary Diversity Score: Sum of number of food groups consumed by women in **previous week** (range 0-10)
- Constructed **"Daily"** dietary diversity score based on having consumed food group ≥ 7 times per week, which assumes intake ≥ 1 time per day

Grains	Legumes	Nuts & Seeds	Dairy	Meat/Fish/ Poultry
Eggs	Dark Green Leafy Vegies (DGLV)	Other Vitamin A rich Fruits & Vegies (OVAFV)	Other Vegies (OV)	Other Fruits (OF)

Outcome: Women's Nutritional Status

- Mean Mid-upper Arm Circumference (MUAC)
- Mean Body Mass Index (BMI) derived from weight & height measurements ($BMI = \text{Weight in Kg} / \text{Height}^2 \text{ in cm}$)



Potential Confounders

Women:

Age, Parity, Schooling

Household:

Household size, Caste, Religion, Monthly Food expenditure,
Wealth Index

Ecological:

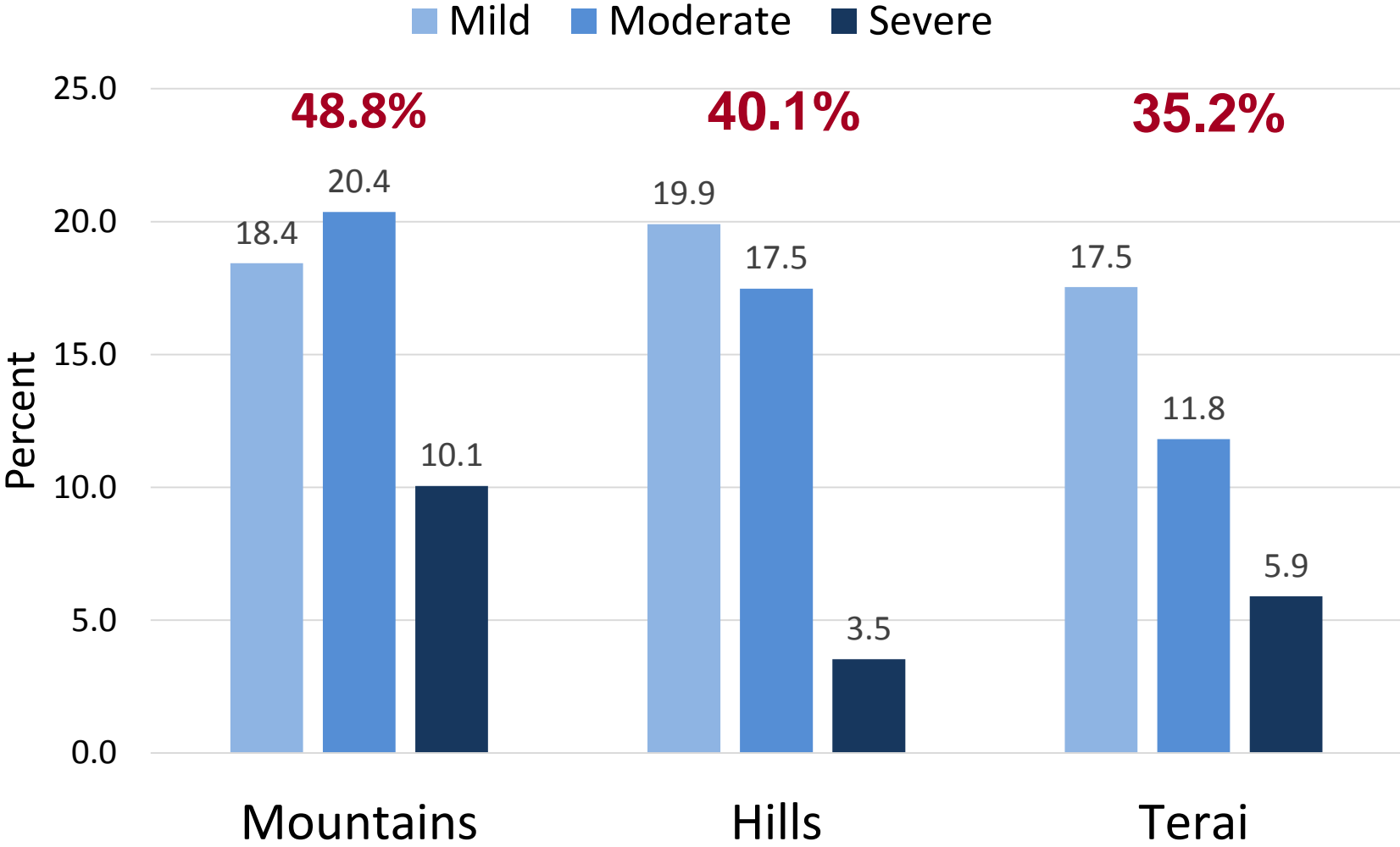
Agro-ecological zone

Analysis

1. Bivariate analysis
2. Logistic regression (unadjusted & adjusted) to examine odds of consuming any food item from each food group by level of household food insecurity
3. Linear regression (unadjusted & adjusted) to examine differences in mean dietary diversity score & weekly consumption frequency by level of household food insecurity
4. Linear regression (unadjusted & adjusted) to examine relationship between women's nutrition status by level of household food insecurity

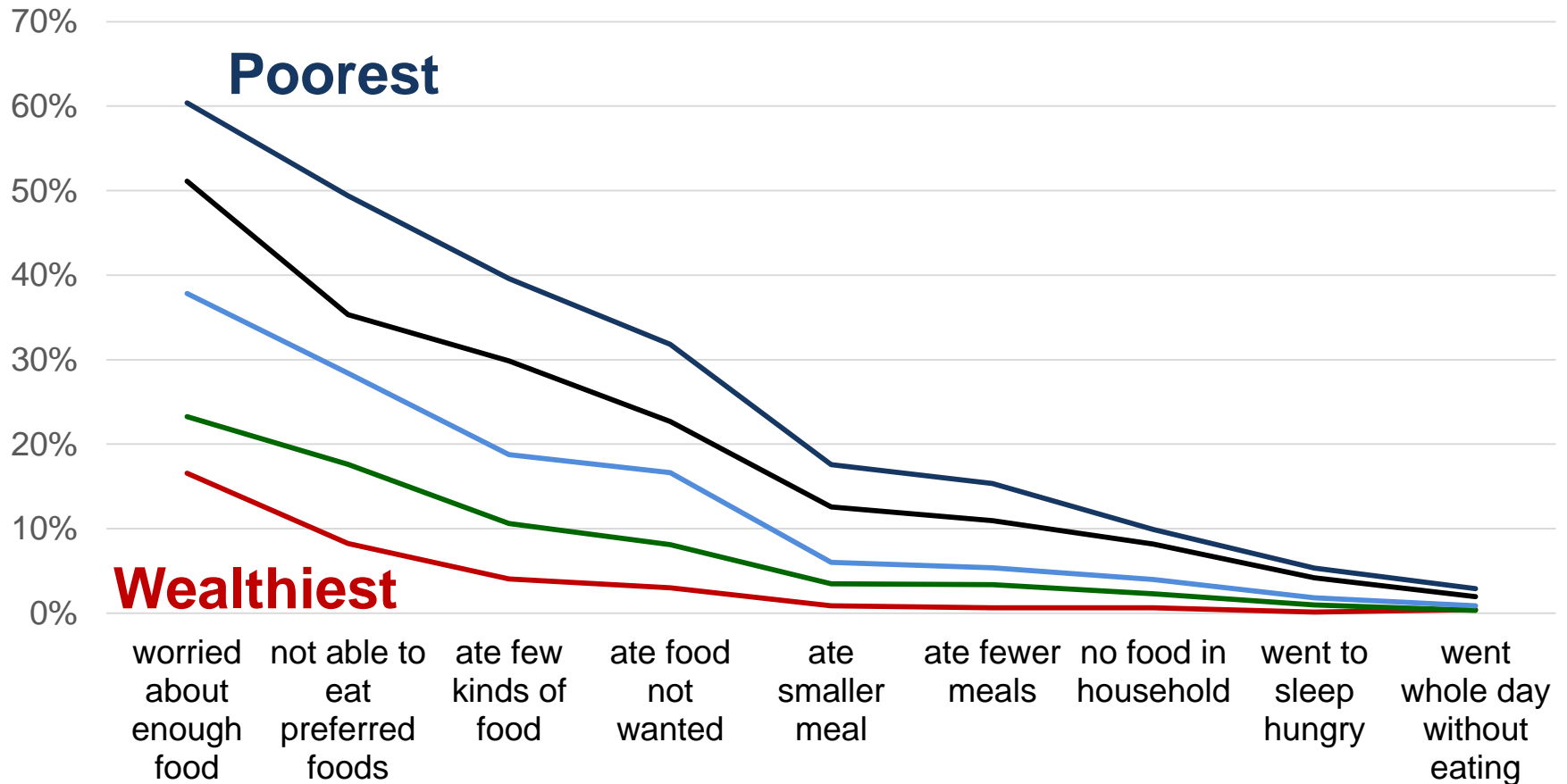
Analyses adjusted for cluster design

Household food insecurity higher in mountains, followed by hills, then terai



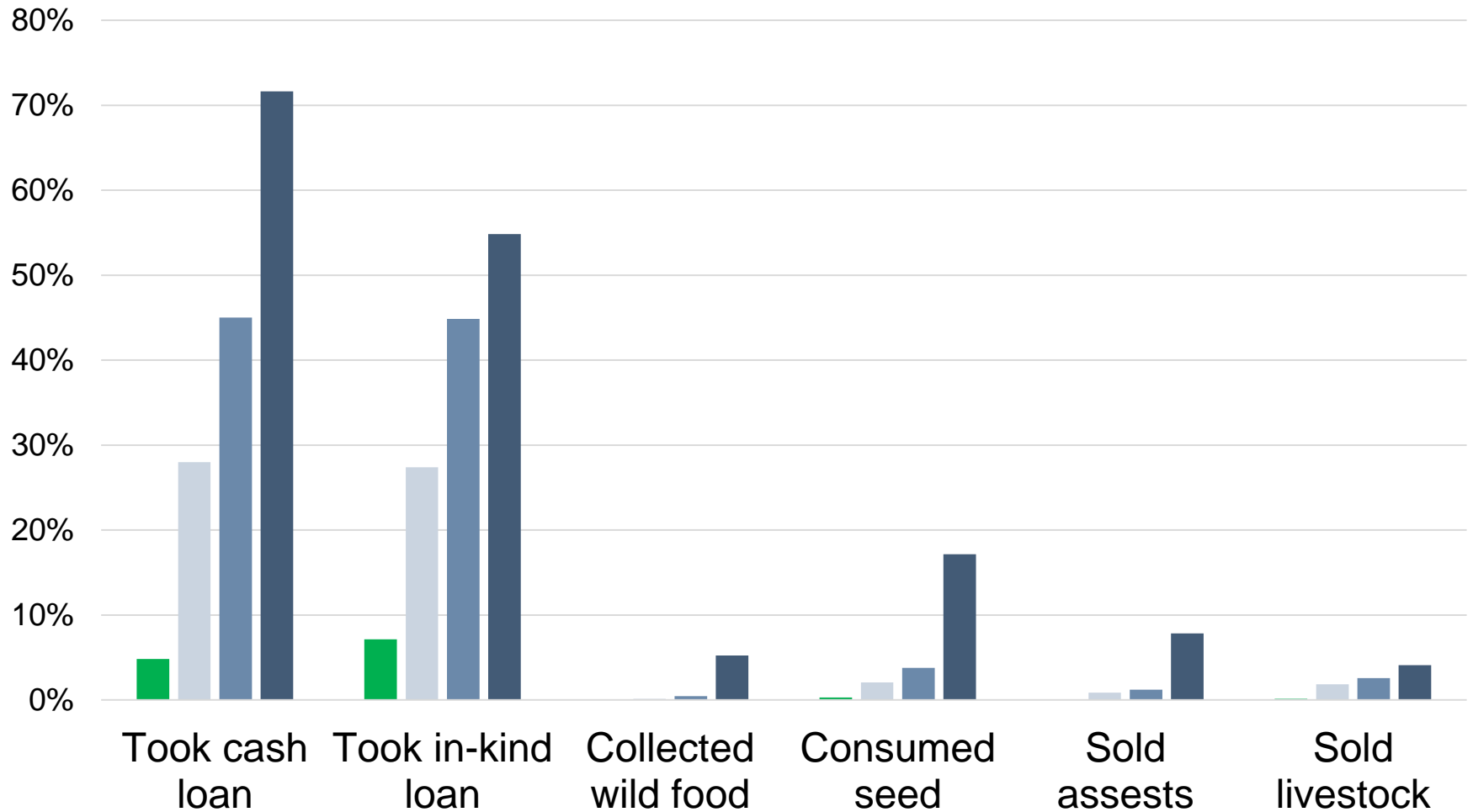
Clear relationship between wealth (quintiles) and more severe food insecurity across domains of the HFIAS

— 1st — 2nd — 3rd — 4th — 5th

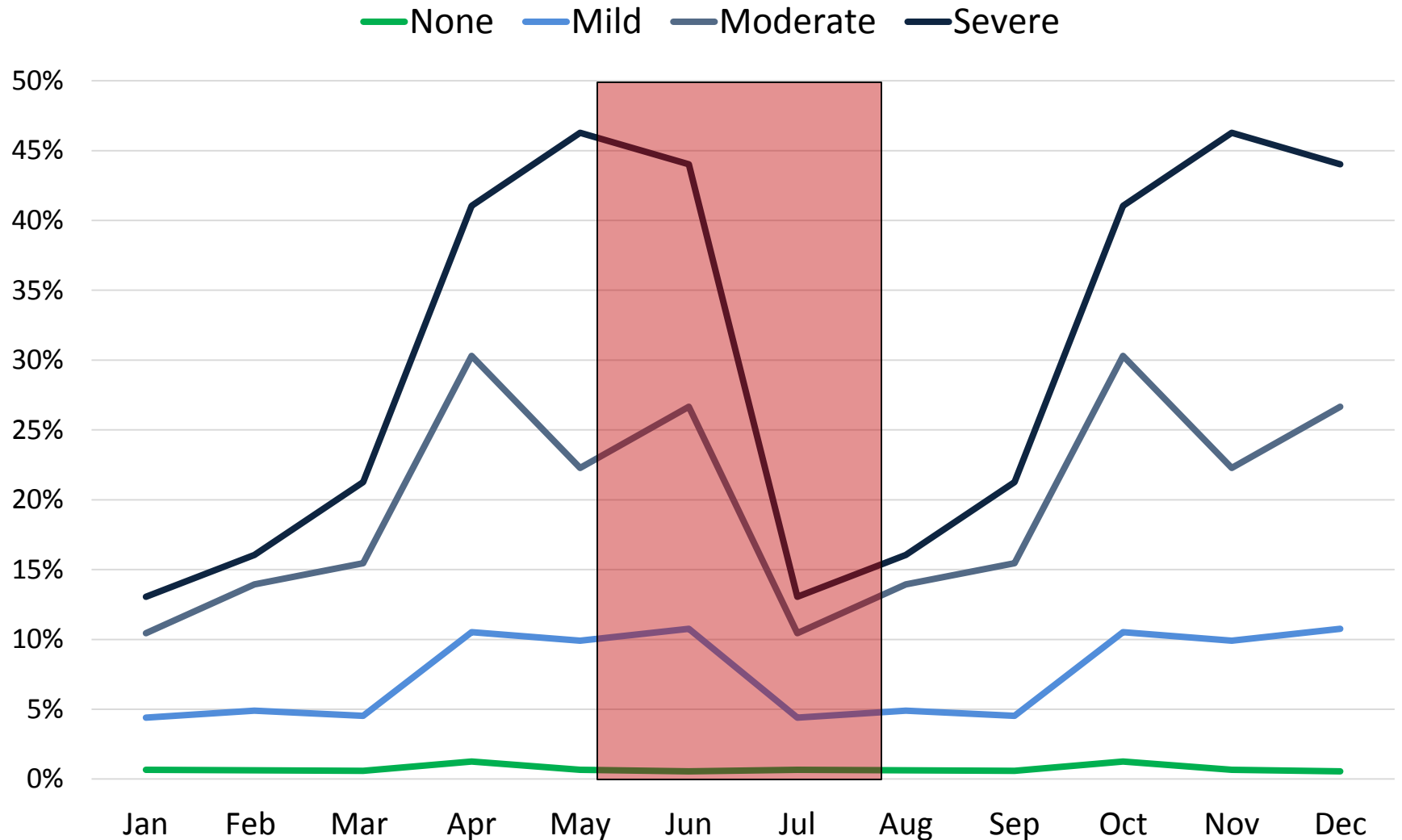


Coping strategies by household food insecurity status

■ None ■ Mild ■ Moderate ■ Severe



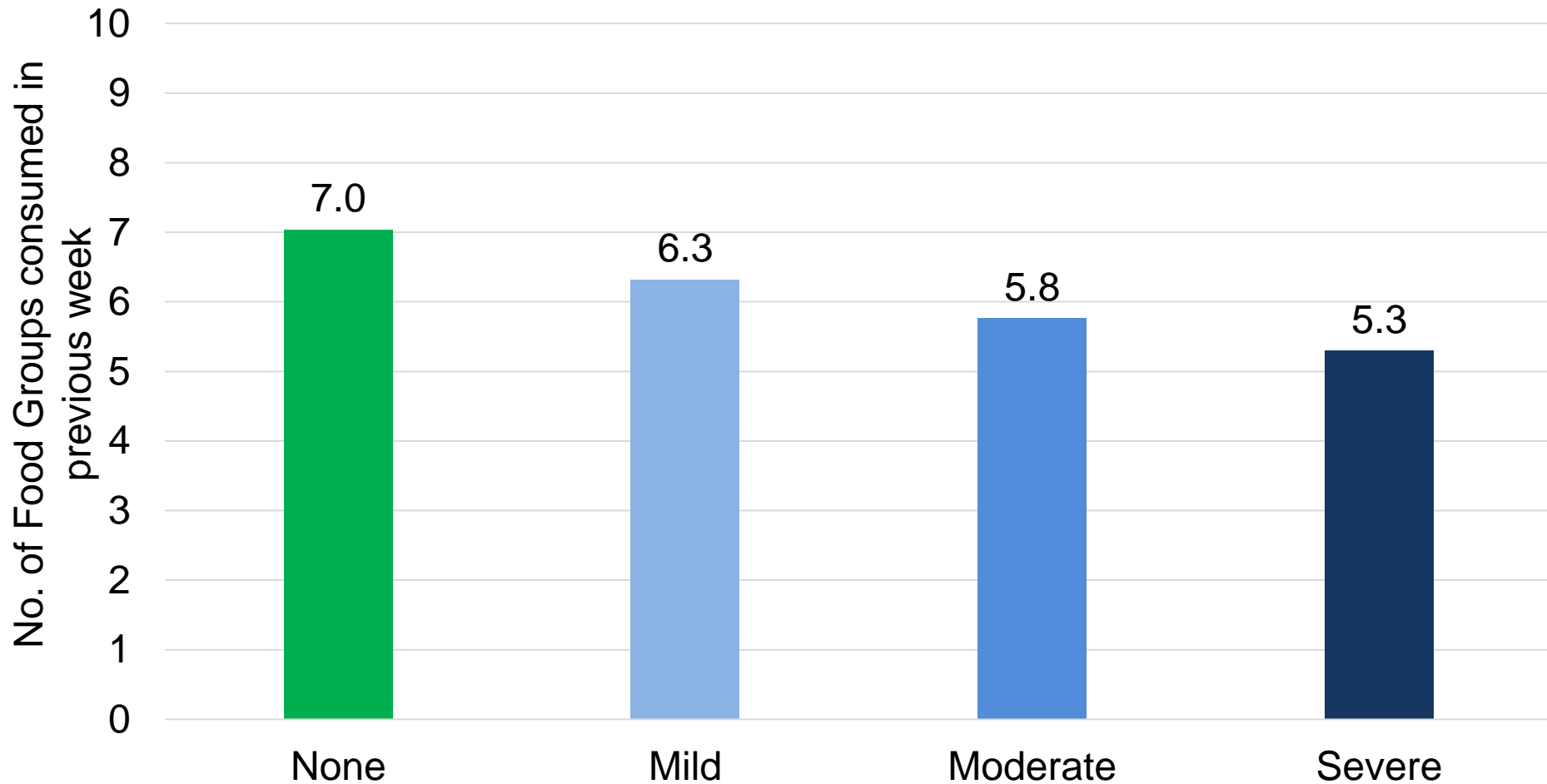
Months when households did not have enough food to meet family need



Household Characteristics by level of Household Food Insecurity

	None n=2,722	Mild n=818	Moderate n=660	Severe n=268
Woman's Characteristics, mean (SD)				
Schooling, y	5.2 (5.0)	2.9 (4.1)	2.1 (3.7)	1.3 (2.9)
Parity	2.3 (1.5)	2.7 (1.7)	3.0 (1.8)	3.3 (2.0)
Household Characteristics				
Caste (%)				
Brahmin or Chettri	75.6	16.9	6.3	1.3
Other terai	67.4	15.9	11.3	5.5
Dalit	34.0	27.0	27.5	11.6
Newar	90.7	6.5	1.9	0.9
Janjati	68.1	17.5	10.8	3.7
Muslim	58.1	20.0	16.3	5.6
Land ownership, hectares, mean (SD)	0.7 (1.0)	0.4 (0.4)	0.3 (0.4)	0.2 (0.3)
Amount of rice stored, kg, mean (SD)	77 (126)	57 (97)	50 (97)	48 (126)

Women's Dietary Diversity Score* (range 0-10) by Household Food Insecurity Status

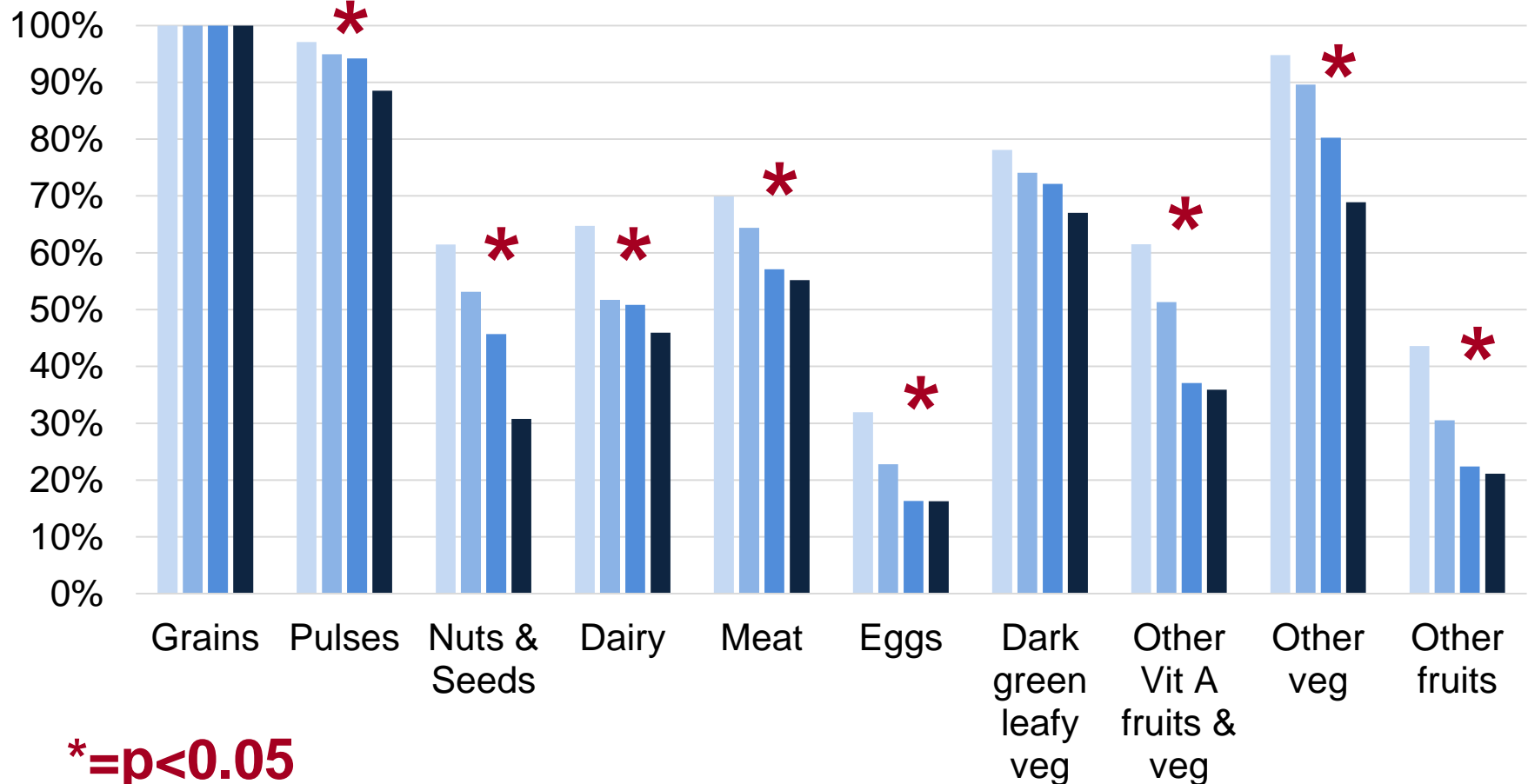


***Based on weekly intake**

Level of Household Food Insecurity

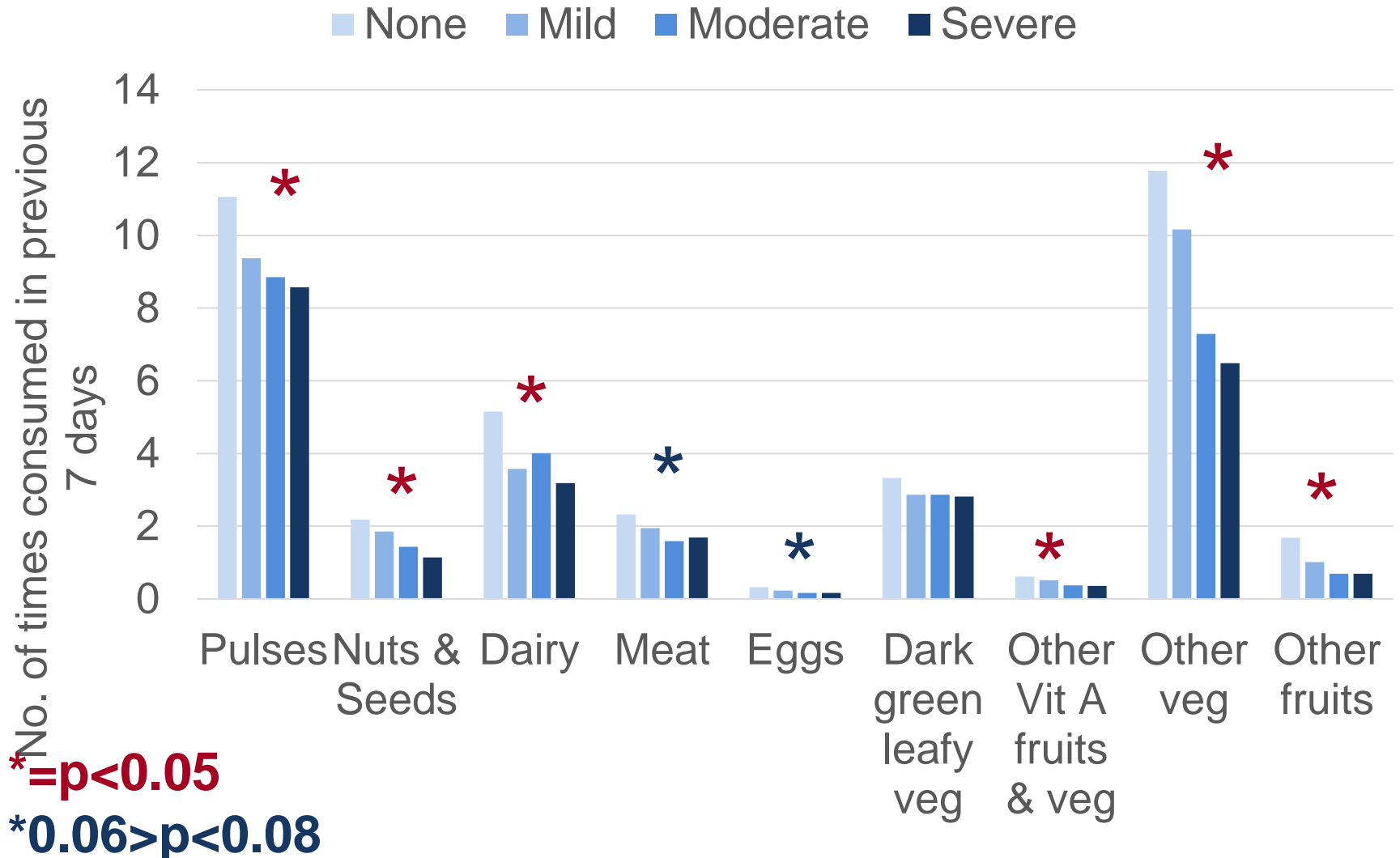
As food insecurity worsens a smaller proportion of women consume foods from each food group (except for grains).

None Mild Moderate Severe

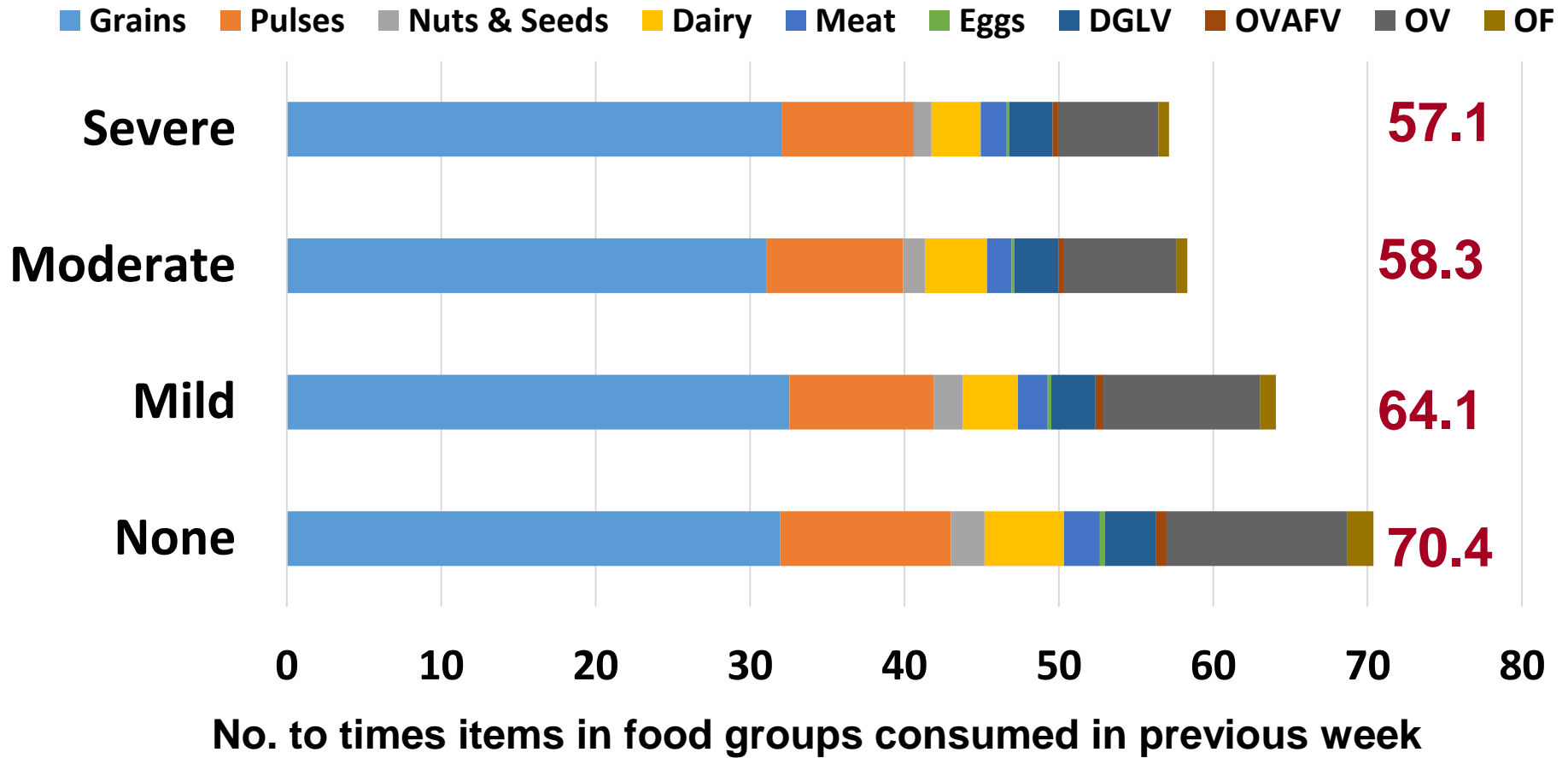


***=p<0.05**

As food insecurity worsens there is a lower weekly frequency of consumption for each food group

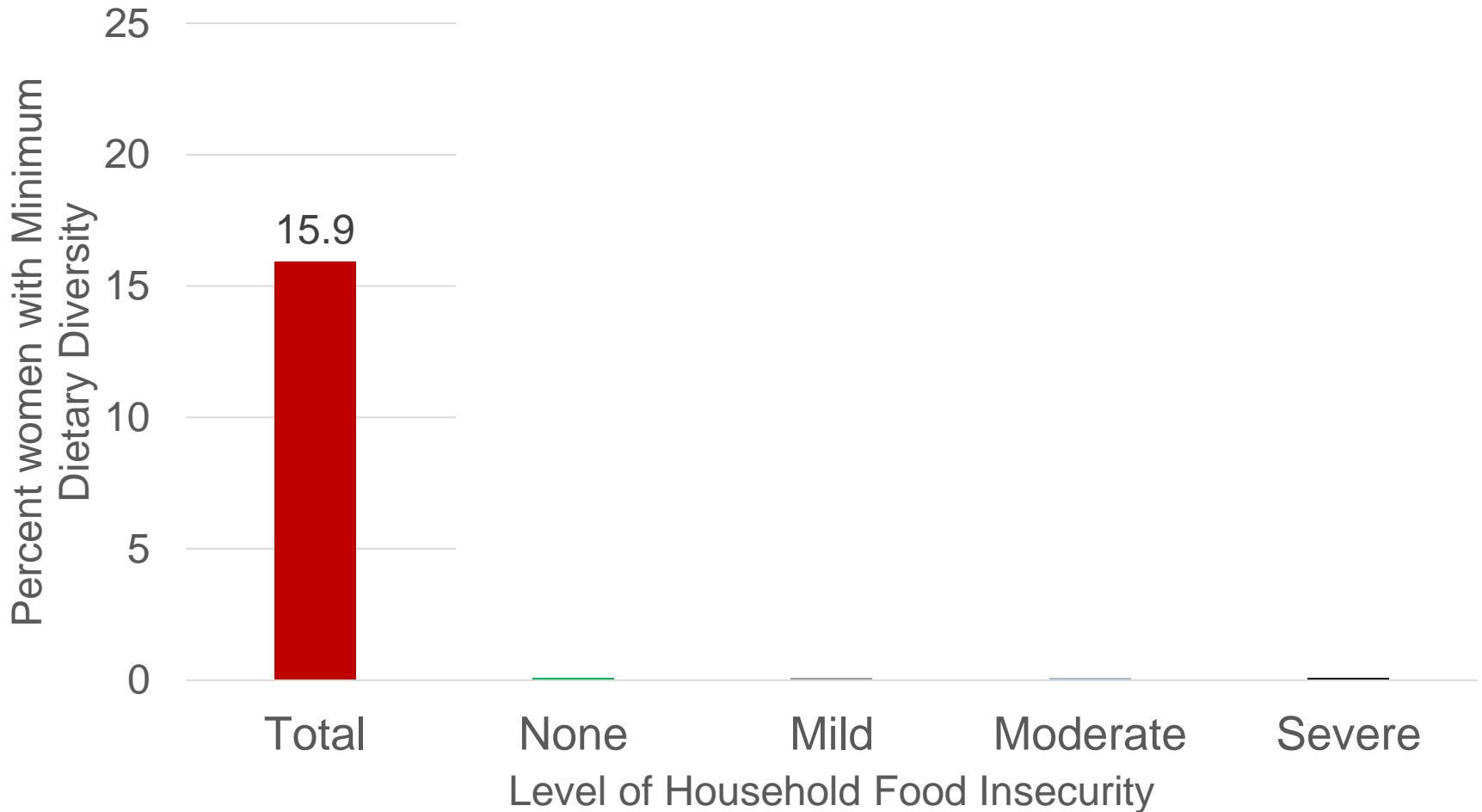


Women's weekly intake frequency by level of household food insecurity



DGLV=Dark Green Leafy Vegetables, OVAFV=Other vitamin A rich fruits & vegetables, OV=Other vegetables, OF=Other fruits

% Women meeting daily Minimum Dietary Diversity threshold (≥ 5 out of 10 food groups) by level of household food insecurity



Adjusted* Odds of women consuming any item from food group in previous week relative to women in Food Secure Household

P<0.05	Level of Household Food Insecurity		
	Mild	Moderate	Severe
Pulses	0.9	1.1	0.5
Nuts & Seeds	1.0	0.9	0.5
Dairy	0.7	0.8	0.7
Meat	0.9	0.8	0.7
Eggs	0.8	0.6	0.7
DGLV	1.0	1.0	0.8
Other VA Fruits & Vegies	0.9	0.7	0.6
Other vegies	0.8	0.6	0.3
Other fruits	0.8	0.7	0.7

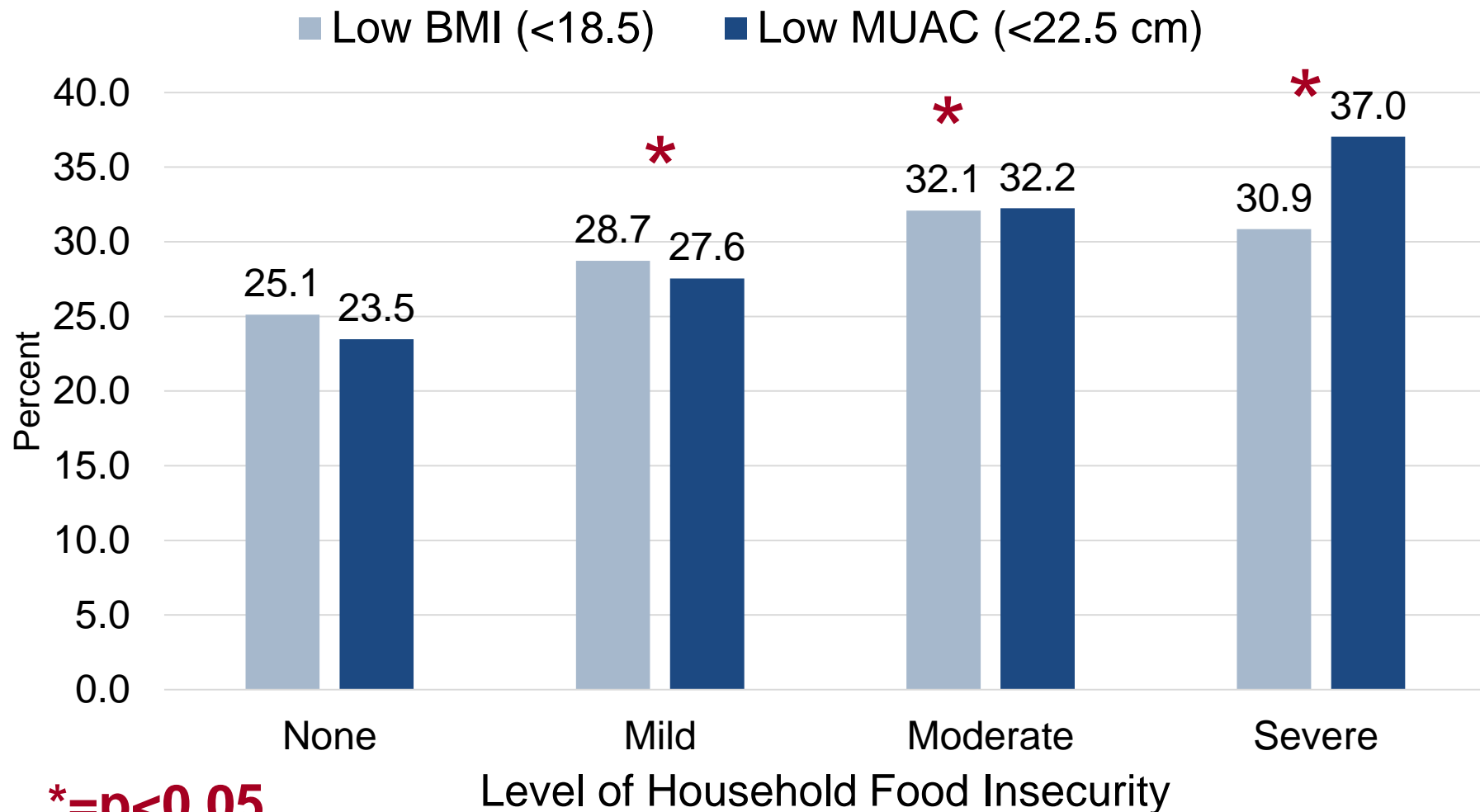
*Adjusted for agro-ecological zone, caste, woman's age, women's education, women's MUAC, household monthly food expenditure, wealth quintile

Adjusted* mean weekly intake frequency & WDDS relative to women in food secure household

*= $p < 0.05$	Level of Household Food Insecurity			
	None	Mild	Moderate	Severe
Pulses	6.3	-0.7	-0.8	-1.2
Nuts & Seeds	2.2	0.0	-0.2	-0.5
Dairy	5.2	-1.2	-0.9	-1.6
Meat	2.4	-0.1	-0.3	-0.2
Eggs	1.1	-0.1	-0.3	-0.2
DGLV	3.3	-0.2	-0.1	-0.2
Other VA fruits & vegies FA	3.4	0.1	-0.5	-0.3
Other vegies	11.8	0.2	-1.7	-2.3
Other fruits	1.7	-0.3	-0.4	-0.3
Total # foods	98.7	-3.2	-10.1	-10.8
WDDS (weekly)	7.0	-0.2	-0.4	-0.8

*Adjusted for agro-ecological zone, caste, woman's age, women's education, women's MUAC, household monthly food expenditure, wealth quintile

Maternal undernutrition by level of household food insecurity



Unadjusted & adjusted* BMI & MUAC relative to women in food secure household

	Level of Household Food Insecurity			
	None	Mild	Moderate	Severe
BMI				
Unadjusted	20.8	-0.5	-0.9	-1.0

*Adjusted for women's age, no. children <5 y, women's schooling, agro-ecological zone, monthly food expenditure

Key Messages

- Poor dietary quality of women's diets (15.9% meet minimum dietary diversity level of ≥ 5 food groups per day)
- High levels of women's undernutrition (~27%)
- Both women's dietary diversity and nutritional status worsens with increased severity of household food insecurity.
- Decline in maternal dietary diversity largely due to reductions in all types of animal-source foods (esp. dairy, eggs, meat/poultry/fish), pulses, nuts & seeds and other vitamin A rich fruits and vegetables.

Key Messages

- Pattern of dietary risk & poor nutritional status was most clearly explained by a “wealth index”.
- Impoverishment to be the major driver of low dietary diversity & poor women’s nutritional status.
- HFIAS (9-items) may be a useful tool for identifying households for targeting agriculture, nutrition and income generation interventions—severe & moderate levels.
- Interventions to promote food security may be most effective if they are targeted toward the poorest households and include income.
- Need to consider seasonality of food insecurity.

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Thank You!



Feed the Future Innovation Lab
For Collaborative Research on Global Nutrition



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FROM THE AMERICAN PEOPLE



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