



# Women's empowerment in agriculture, production diversity and nutrition: Evidence from Nepal

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# Roadmap

- Why we should care about women's empowerment, production diversity and nutrition
- Key findings
- How we did it
- What we found
- Summary and some parting thoughts

# INTRODUCTION





# Why agriculture for nutrition?

- Agricultural growth and development is effective in reducing poverty, but do NOT necessarily translate into improved nutrition outcomes
- A wide body of literature demonstrates that links between agriculture, health and nutrition are dynamic and multifaceted (Gillespie 2001; Headey 2011; Hoddinott 2011)
- *How should agricultural policies and programs be designed and implemented to achieve nutritional objectives?*



# Gender matters!

- Direct links between agriculture and nutrition:
  1. Agriculture as a source of food
  2. Agriculture as a source of income and expenditures
  3. Agricultural policy and food prices
  
- 5 pathways through which agricultural interventions can affect nutrition (Arimond et al 2010):
  1. Increased food for own consumption
  2. Increased income
  3. Reductions in market prices
  4. Shifts in preferences
  5. Shifts in control of resources within households

**All mediated by gender roles**



# Women's Empowerment in Agriculture Index (WEAI)

- **Design**

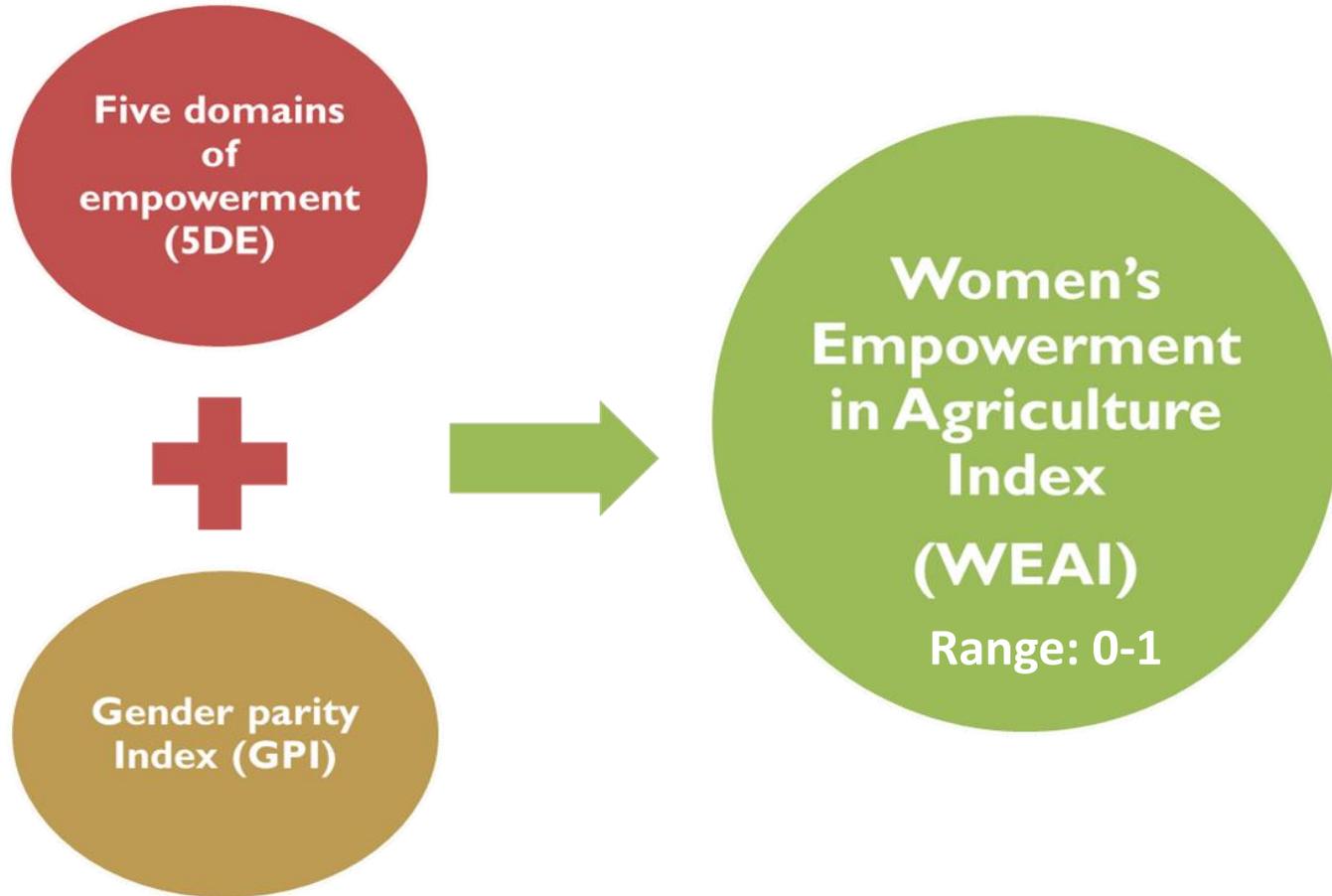
- Survey based index asking the same set of questions of both the primary adult *male and female* in a household
- Piloted in 2011 - Bangladesh, Guatemala and Uganda
- Developed by USAID, IFPRI and Oxford Poverty and Human Development Initiative (OPHI)

- **Innovation**

- First index to directly capture women's empowerment in agriculture rather than proxies (e.g. income, education)
- Diagnostic: diagnose patterns of disempowerment and identify areas for policy intervention
- Gender parity
- Can be used to study the relationship between empowerment and desired outcomes in different socio-cultural contexts

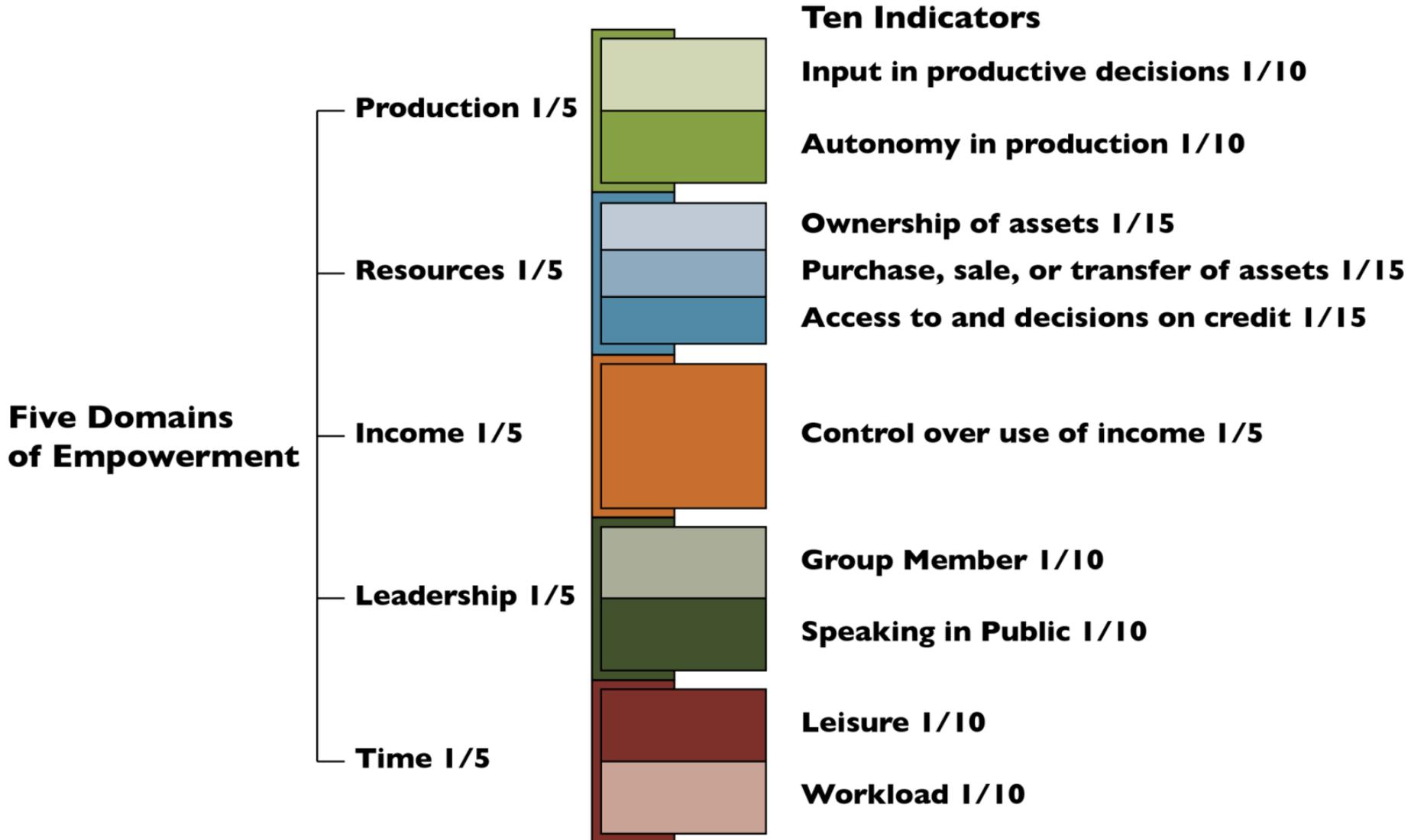


# How is WEAI constructed?





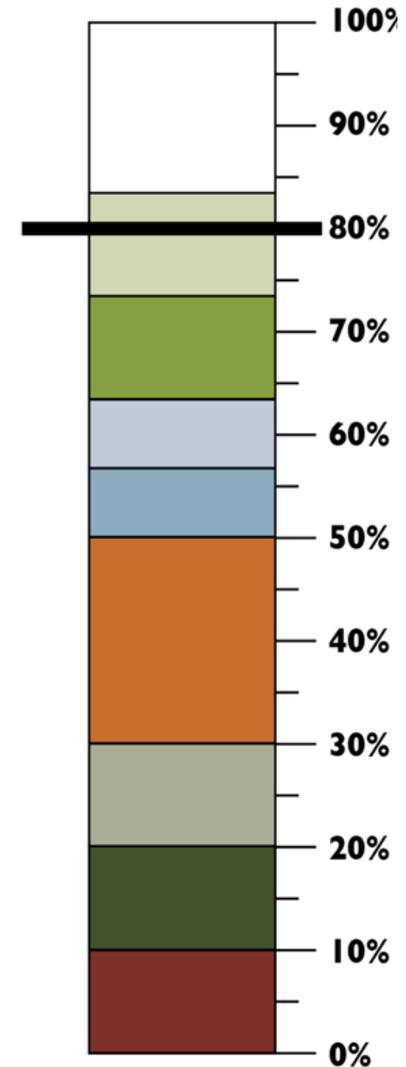
# Five Domains of Empowerment (5DE)





# Who is empowered?

A woman who has achieved 'adequacy' in 80% or more of the weighted indicators is empowered





# Study objectives

1. To examine how production diversity and key indicators of women's empowerment are linked with mother and child nutrition outcomes in rural Nepali households
2. To examine whether production diversity and women's empowerment mediate each other's relationship with mother and child nutrition outcomes



# Key findings (spoiler alert!)

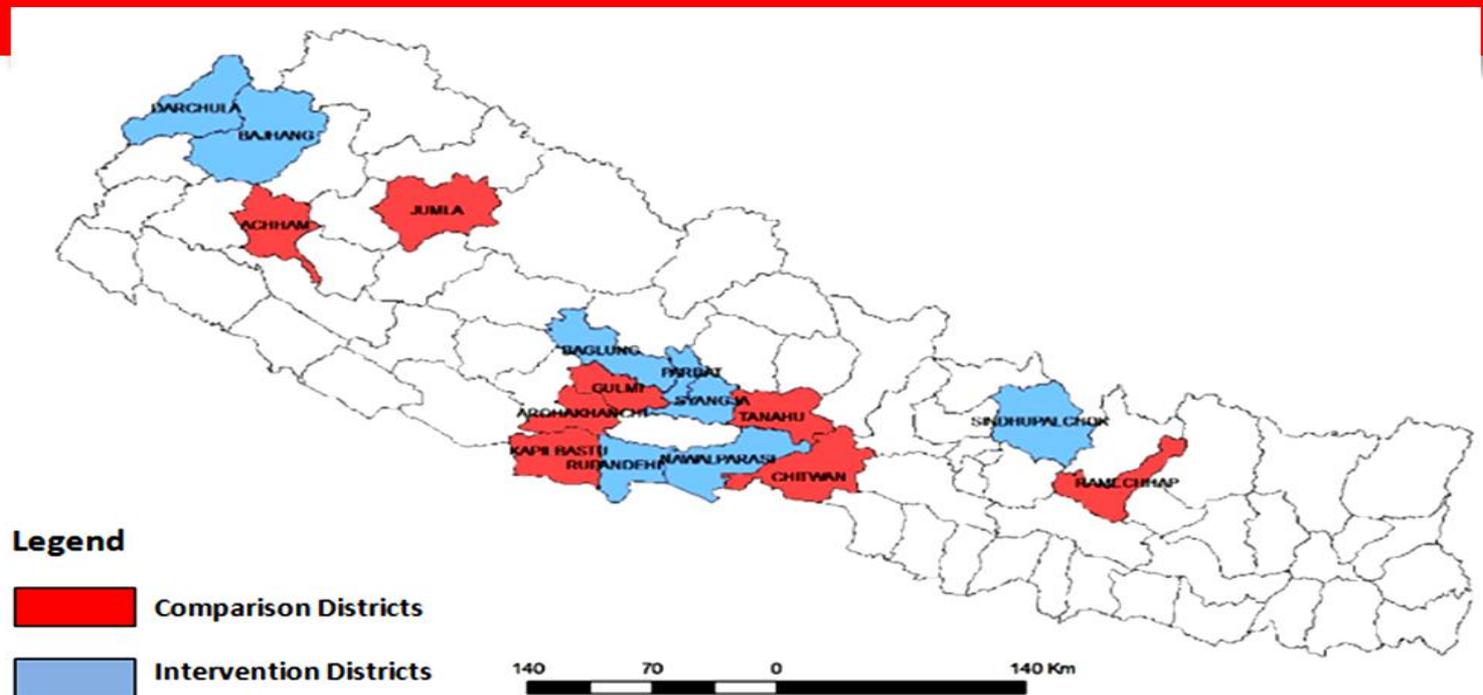
- Production diversity is positively associated with nutrition outcomes for mothers and children (DD, WHZ, WAZ)
- Women's autonomy in production is positively associated with children's outcomes (HAZ, WAZ)
- Weak evidence that production diversity and women's empowerment interact
- Domains of empowerment that are significant for mother and child nutrition may not always overlap

# DATA AND METHODS



# Data

- Baseline survey of an impact evaluation for *Suaahara*, a USAID funded multisectoral intervention, to address maternal and child undernutrition in Nepal
- Data collection: June 13- Oct 6, 2012 – New Era, IFPRI
- 4,080 households in 240 communities across 16 districts in 3 AEZs



# Survey Questionnaires: Household Level

## Women

- ❖ Child Health and Childcare
- ❖ **IYCF Practices**
- ❖ Household Food Security
- ❖ **Maternal Dietary Diversity**
- ❖ **Empowerment**
- ❖ Information Access
- ❖ Maternal Health
- ❖ IYCF Knowledge and Beliefs
- ❖ Water, Sanitation, and Hygiene
- ❖ **Anthropometry** and Hemoglobin
- ❖ Grandmother's Perspectives

## Men

- ❖ Household Roster
- ❖ Household Economics
- ❖ Social Assistance
- ❖ **Agricultural Practices and Land Use**
- ❖ **Empowerment**
- ❖ House and WASH Observations



# Key outcome variables

## 1. Child level

- Child anthropometry (HAZ; WAZ; WHZ)
- Child dietary diversity using WHO recommended 7 food groups
  - Starchy staples; Beans, lentils and nuts; dairy; eggs; and all flesh foods including meat, fish, and poultry ; vitamin A-rich fruits and vegetables; other fruits and vegetables

## 2. Maternal level

- BMI (kg/m<sup>2</sup>)
- Dietary diversity using 9 food group indicator
  - Starchy staples; Beans, lentils and nuts; Dairy; Meat; Eggs; Fish; Green leafy vegetables; Vitamin A rich fruits & vegetables; Other fruits and vegetables



# Key explanatory variables

## 1. Agriculture production diversity

- A *9 group production diversity index* (PDI) analogous to the 9 food groups used for maternal dietary diversity

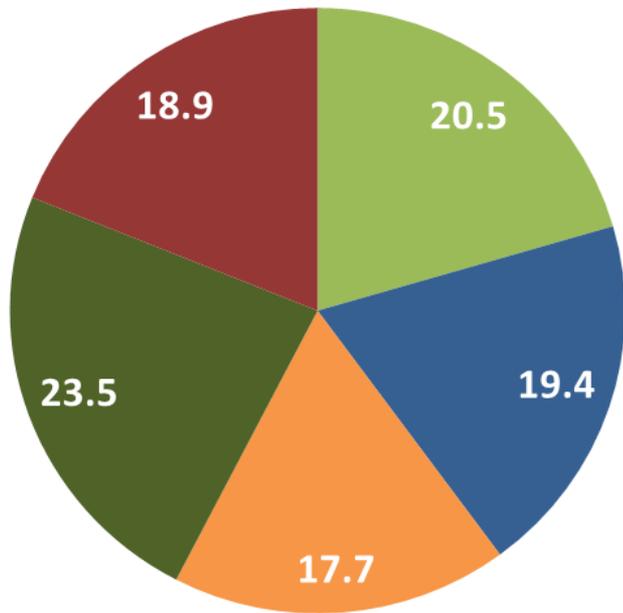
## 2. WEAI

- Aggregate 5DE score
- Decomposed indicators: **Group membership; Control over use of income ; Autonomy in production ; Workload** (indicators with largest contributions to women's disempowerment)
- Gender parity gap (for households with both male and female respondents)

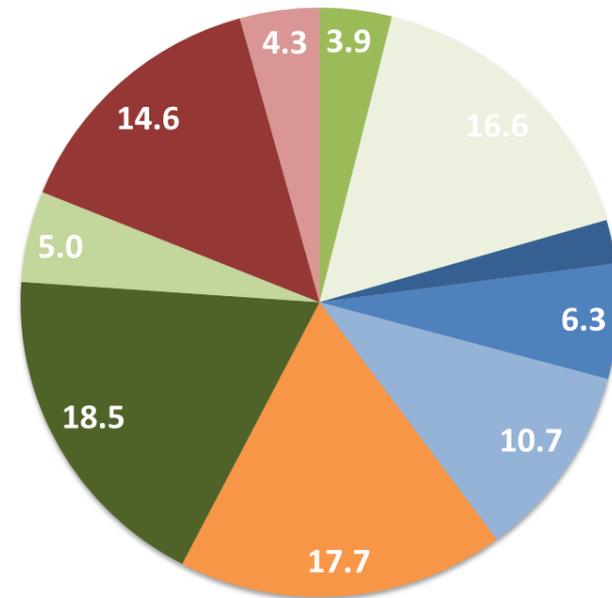


# WEAI Diagnostics

% Contribution of domains & indicators to women's disempowerment



Production Resources Income  
Leadership Time



Input into production decisions Autonomy in production  
Asset ownership Rights over assets  
Access to and decisions on credit Control over use of income  
Group membership Speaking in public confidence  
Workload Leisure



# Empowerment measures

Model #	Indicator	Definition
1	Aggregate empowerment	woman's 5DE score, the weighted average of achievements in the ten indicators
2	Autonomy in production	Relative Autonomy Index (RAI) score
3	Control over income	# ag and nonag activities in which she has input in income decisions or feels she can make decisions
4	Group membership	# of groups in which she is an active member
5	Workload	# hours worked in paid and unpaid activities
6	Gender parity gap	gap between 5DE scores of men and women; =0 if woman is empowered



# Summary statistics

	N	mean	standard deviation	minimum	maximum
<b><i>Dependent variables</i></b>					
<i>Mother's outcomes</i>					
diet diversity score (9 food groups)	2383	6.22	1.71	0	12
Body mass index	2382	20.34	2.63	0	34
<i>Children's outcomes</i>					
diet diversity score (7 food groups)	2158	3.56	1.07	0	7
height-for-age z-score	2357	-1.79	1.23	-5	4
weight-for-height z-score	2360	-0.86	1.04	-4.7	4
weight-for-age z-score	2375	-1.62	1.04	-4.7	3
<b><i>Explanatory variables</i></b>					
<i>Production diversity</i>					
production diversity index (9 food groups)	2383	4.58	1.44	0	8
<i>Women's empowerment indicators</i>					
woman's empowerment score	2383	0.58	0.21	0	1
number of groups woman is an active member of	2383	0.24	0.64	0	7
number of domains woman has some control over income decisions	2383	2.01	1.44	0	9
relative autonomy index score in agricultural activities	2383	0.22	1.47	-9	7
hours spent in paid & unpaid work	2383	11.27	2.97	0	19
gender parity gap (=0 if woman has gender parity, 'gap' if not)	844	0.25	0.23	0	1



# Empirical specification

1.  $N(P, O) = b_0 + b_1 \text{empowerment} + b_2 \text{production diversity} + \mathbf{b}_3 I + \mathbf{b}_4 H + e$
2.  $N(P, O) = b_0 + b_1 \text{empowerment} + b_2 \text{production diversity} + b_3 (\text{empowerment} \times \text{production diversity}) + \mathbf{b}_4 I + \mathbf{b}_5 H + v$

$N(P, O)$  – nutrition practice and outcome vector

$I$  – individual characteristics;  $H$  – household characteristics

- Controls:
  - *Child characteristics*: under 2 years old dummy, girl dummy, age (in months), age squared
  - *Mother characteristics*: age, age squared, height, years of schooling
  - *Household characteristics*: dual adult household dummy, log of household size, dependency ratio, socio-economic status index, caste dummies, intervention group dummy, agro-ecological zone dummies
  - *Climate variables*: 2011 rainfall, maximum and minimum temperature

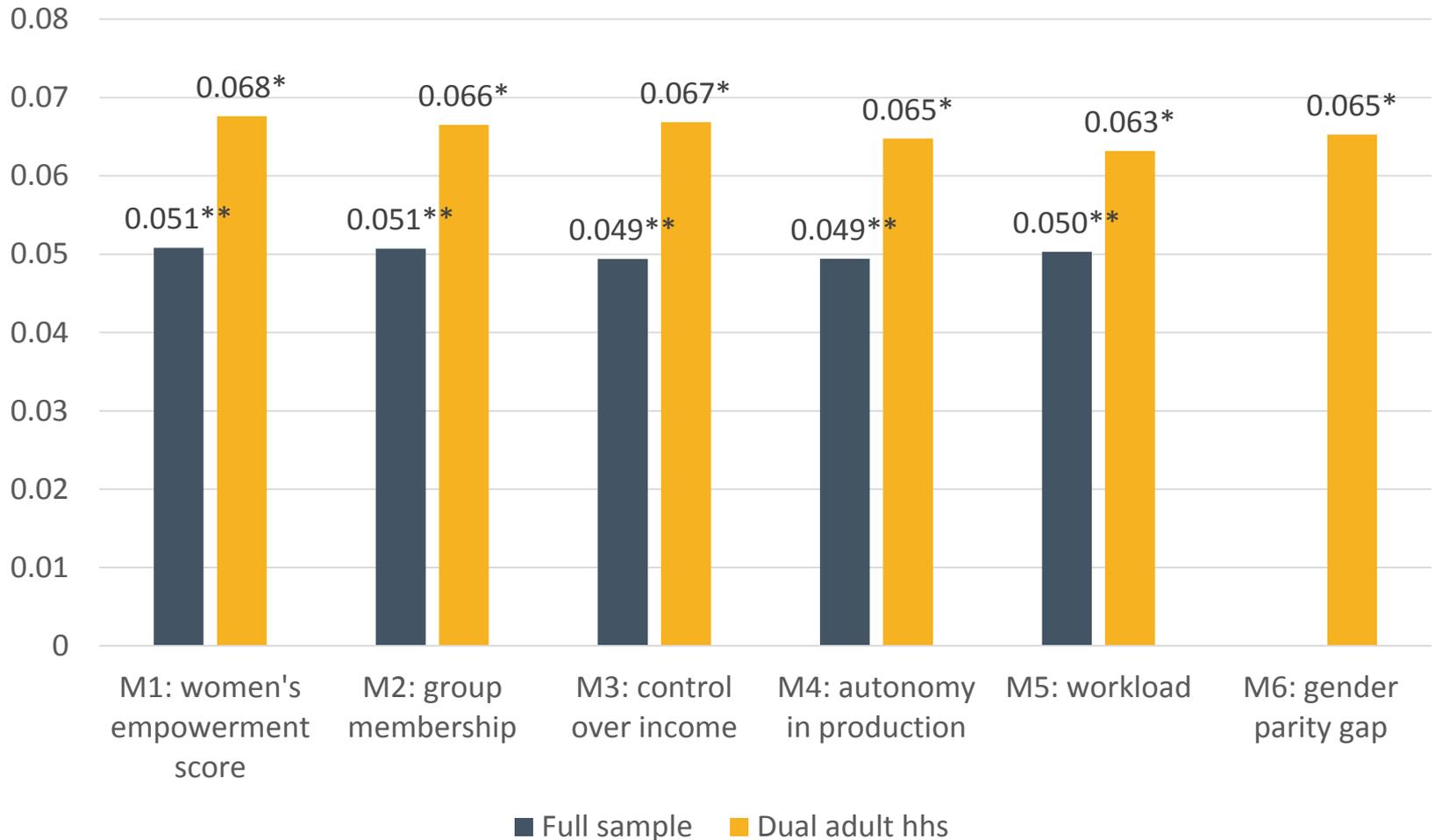
# RESULTS





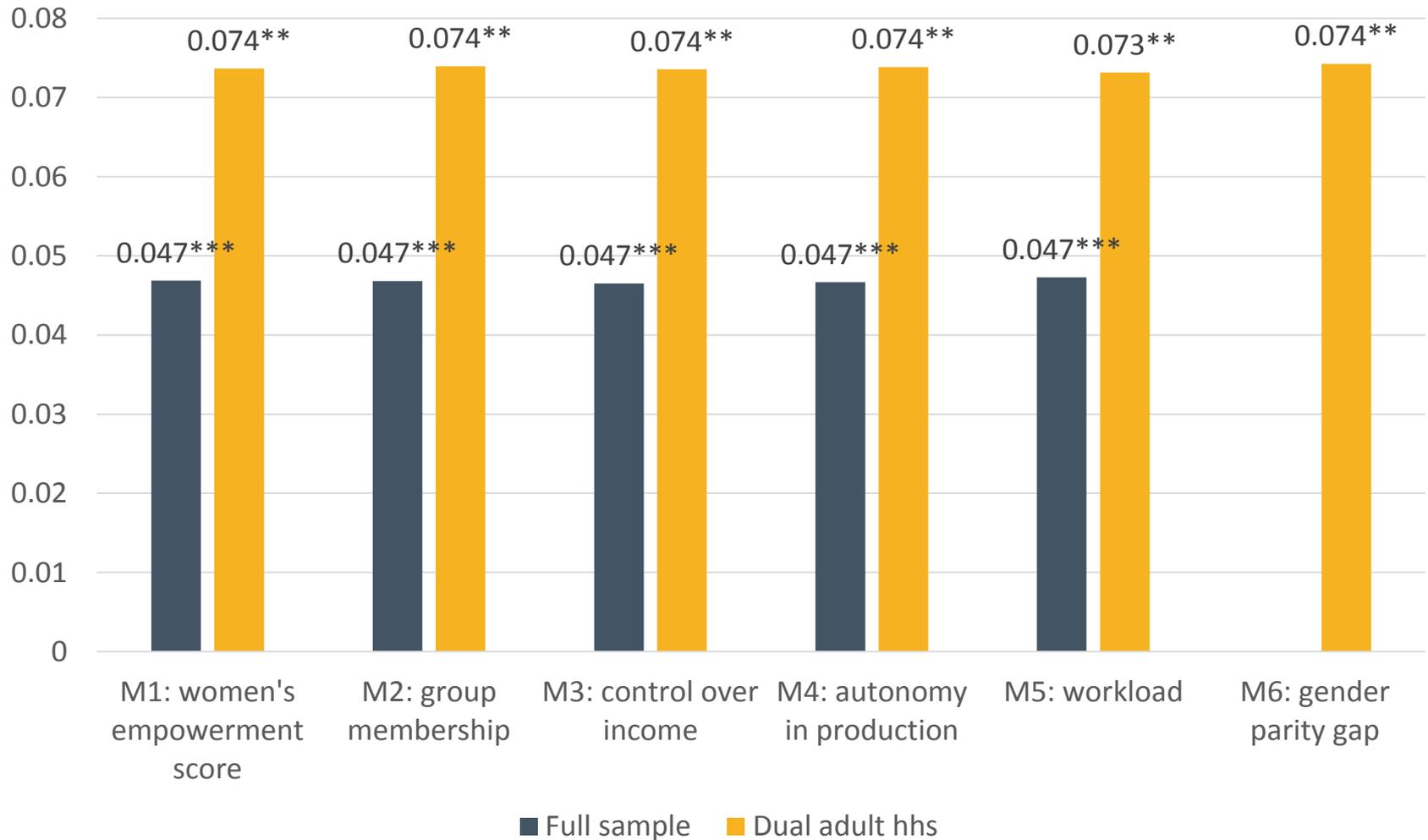
# More diverse production is associated with more diverse diets for mothers...

Mother's dietary diversity and production diversity



# ...and children

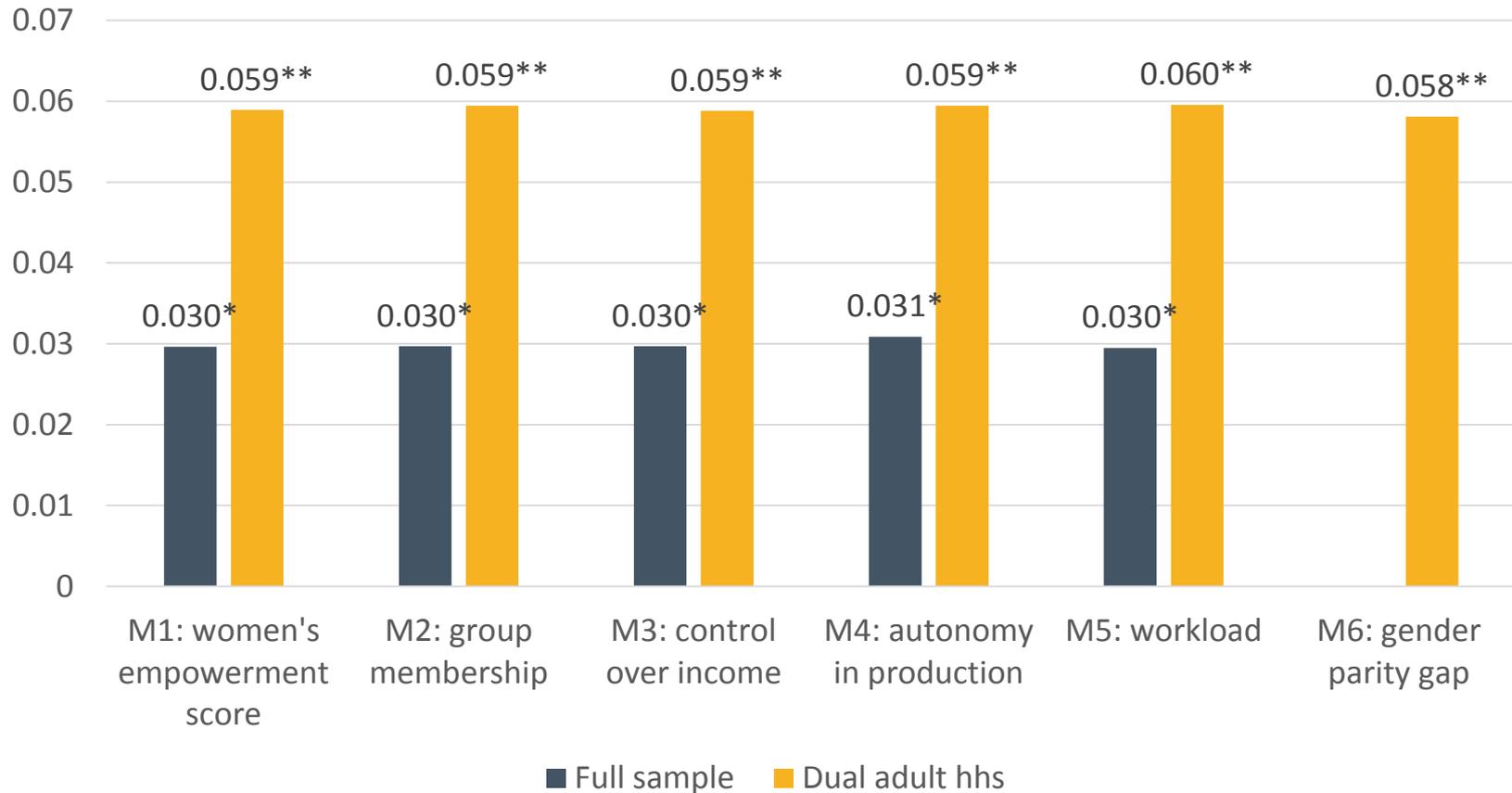
Children's dietary diversity and production diversity





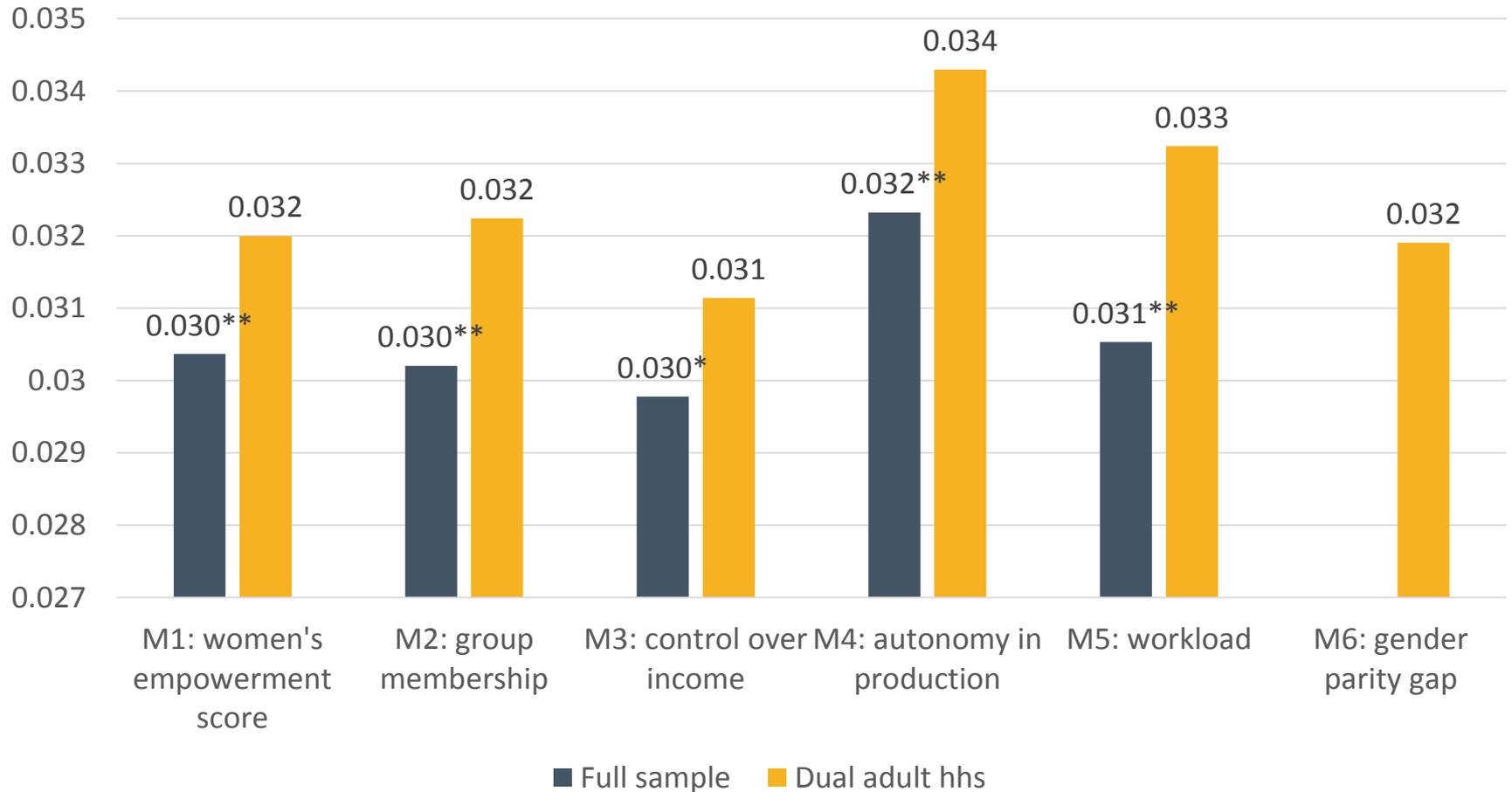
# More diverse production is also associated with children's weight-for-height z-score (WHZ)...

Children's WHZ and production diversity



# ...and children's weight-for-age z-score (WAZ) in the full sample

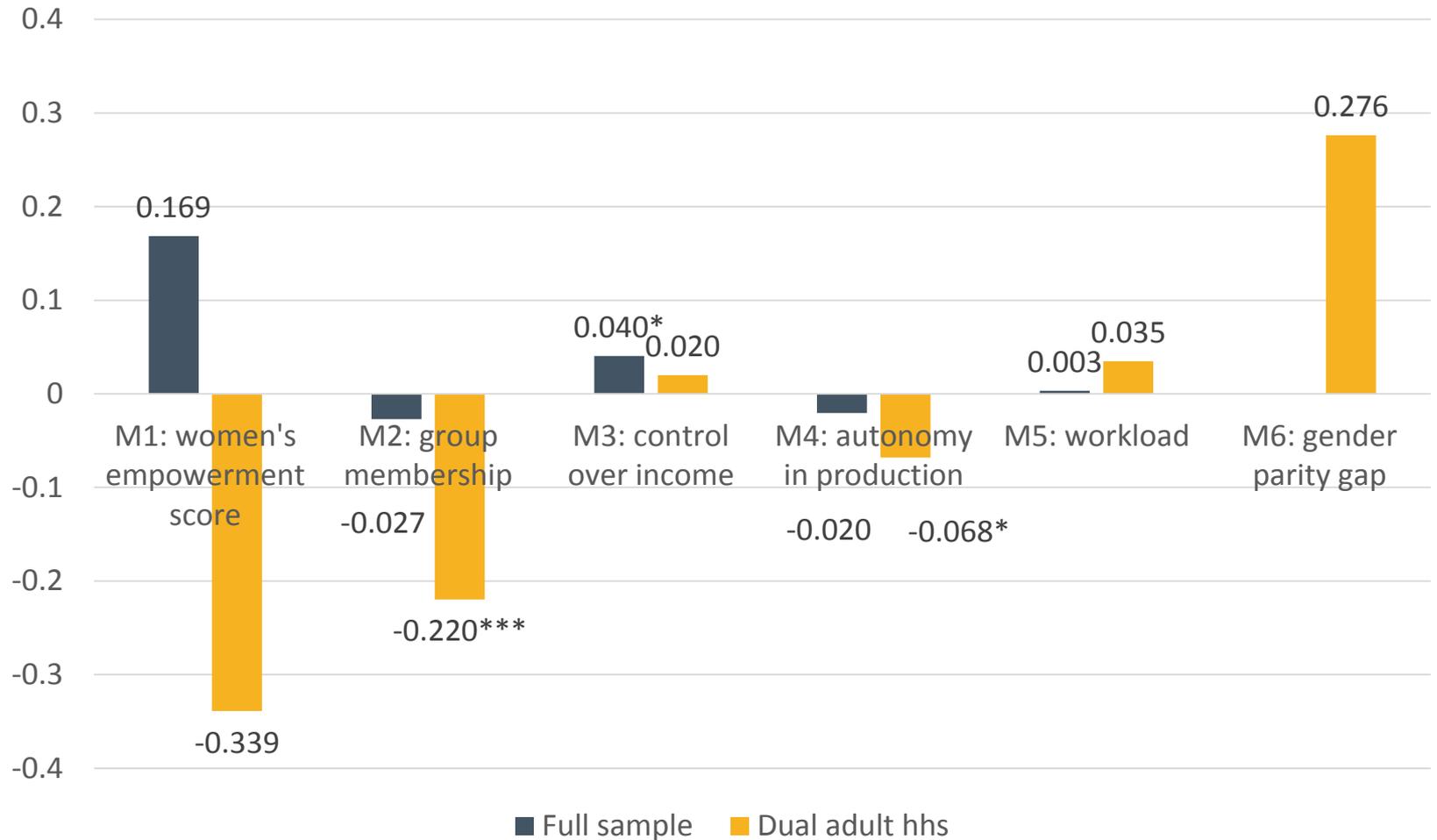
Children's WAZ and production diversity





# Mothers with greater control over income consume **more** diverse diets, but for dual adult households, empowered mothers consume **less** diverse diets

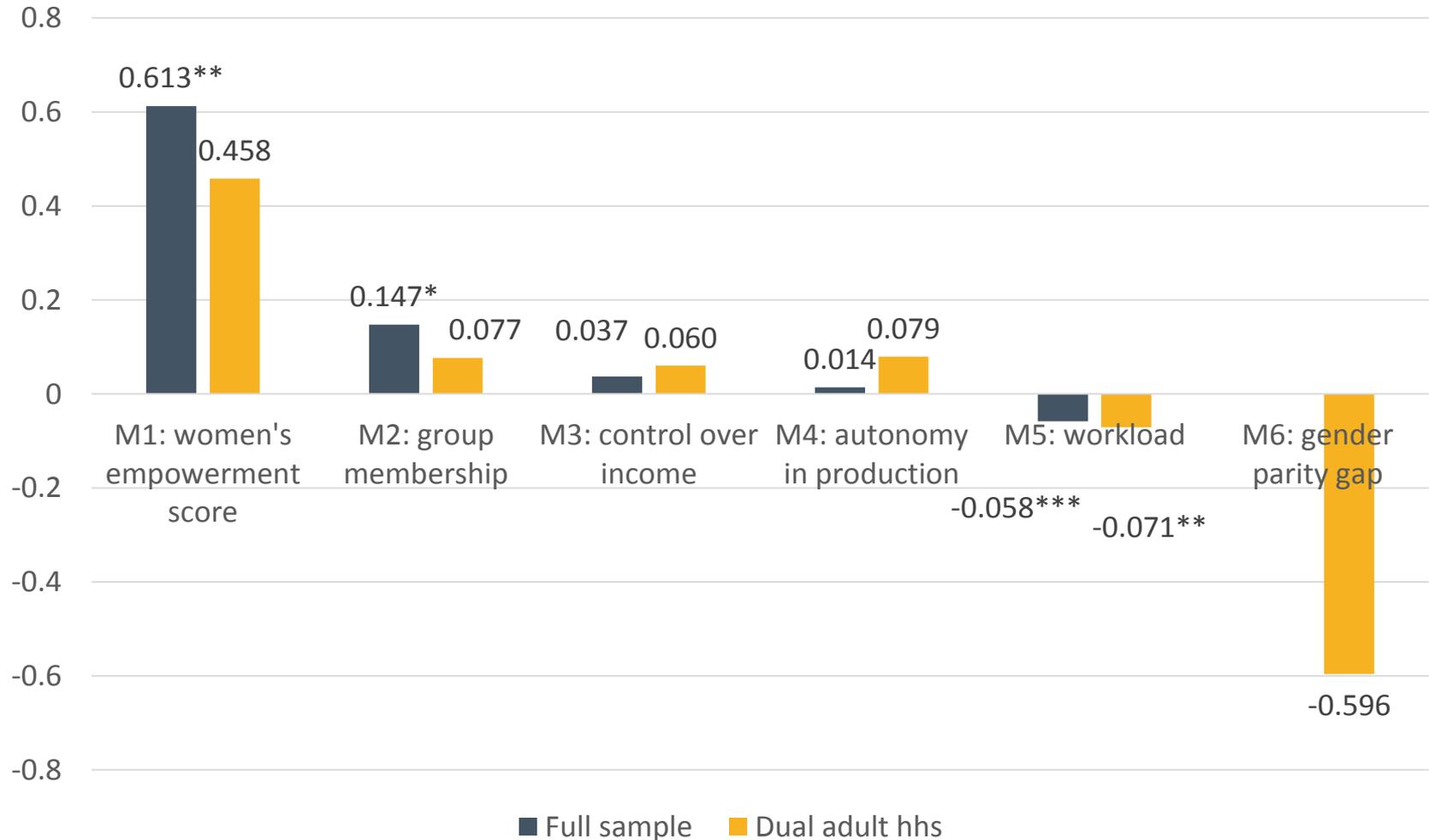
Mother's dietary diversity and empowerment





# Empowered mothers are more likely to have higher body mass index (BMI)

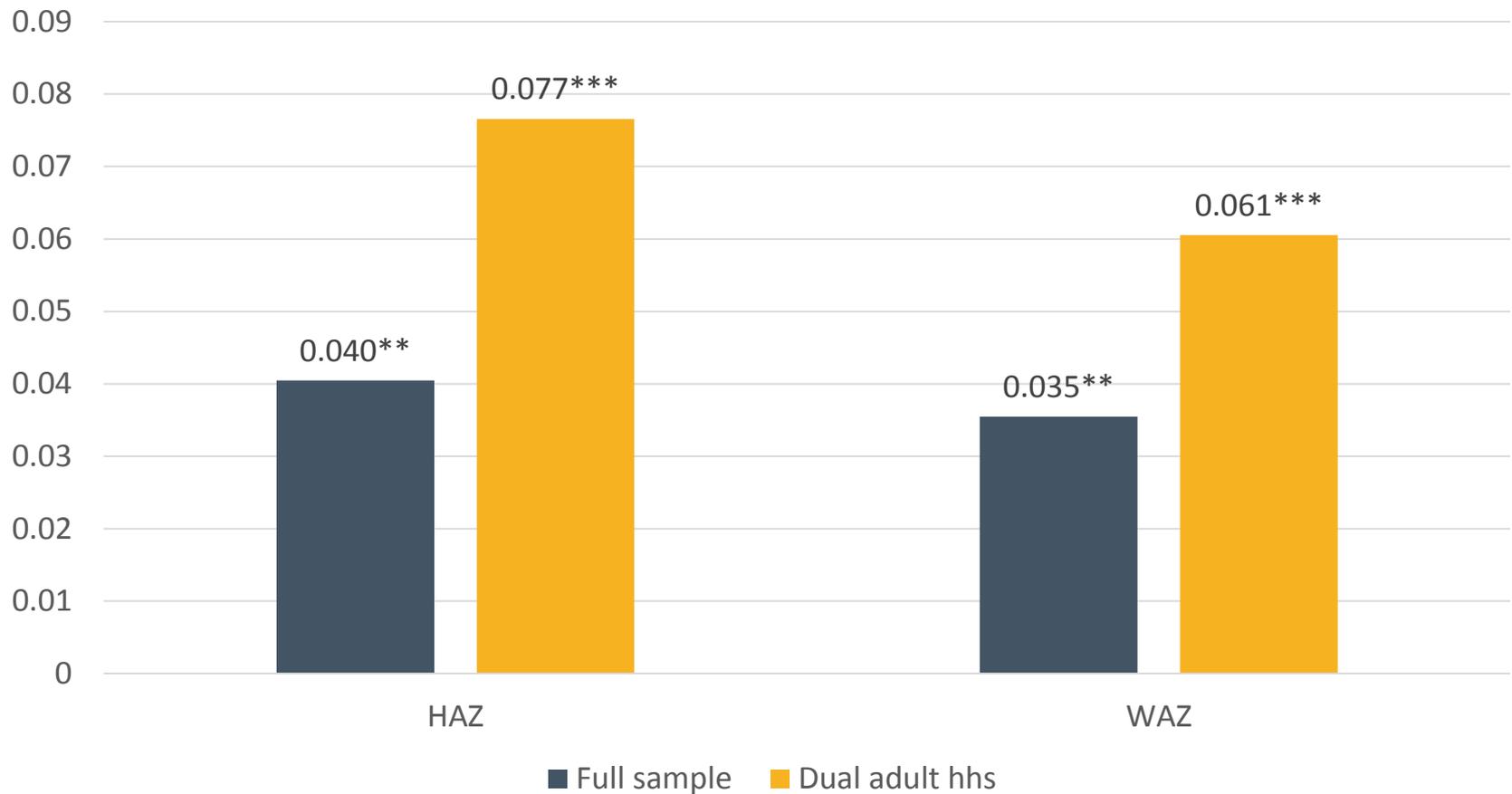
Mother's BMI and empowerment





# Women's autonomy in production is associated with better nutritional status for children (HAZ, WAZ)

Women's autonomy in production and child nutritional status



# CONCLUSION



# 5 Take aways

1. Production diversity is positively associated with nutrition outcomes for mothers and children (DD, WHZ, WAZ)
2. Different aspects of women's empowerment matter for maternal dietary diversity and BMI
  - Unexpected signs for group membership and autonomy in dietary diversity regressions
  - WEAI is decomposable but may **not necessarily be monotonic in indicators** because of context-specific gender norms
3. Women's autonomy in production is positively associated with children's outcomes (HAZ , WAZ)
4. Weak evidence that production diversity and women's empowerment interact
5. Domains of empowerment that are significant for mother and child nutrition may not always overlap



## To conclude...

- In this context, where only a negligible share of production is sold, agricultural interventions that promote diverse production may improve nutrition outcomes
- Different aspects of empowerment matter for different nutrition objectives – policy response will be different
- Noteworthy link between women’s autonomy in production and child nutritional status
  - Interventions to increase women’s agency and capability to make decisions in agriculture provides both an opportunity to engage them more visibly in agriculture, as well as contribute to children’s nutrition

THANK YOU!

