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Household Food Expenditure on Ultra-Processed Foods (Sugar-Sweetened Beverages, Snacks and Sweets) is associated with wealth and education in Nepal

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INTRODUCTION

- The rapid transition in diets in lower and middle-income countries (LMIC) is characterized by a growing demand for ultra-processed foods (UPFs) such as sweets and snacks (SSs) and sugar-sweetened beverages (SSBs).
- In 2006, Huffman et al. 2014 reported 45% of Nepali children under 2 consumed sugary foods while in a 2015 study (Priess et al.) found 75% of infants and young children in Kathmandu valley consumed commercial snack foods prior to 2 years of age (Priess et al. 2015).
- The contribution of ultra processed foods towards overall micronutrient levels was significantly lower than natural/minimally processed foods in Brazil (Lauzada et al 2015)
- An inverse dose–response association was found between ultra-processed food quintiles and overall dietary quality in the US (Steele et al. 2017)





OBJECTIVES

- To estimate household food expenditure on UPFs such as snacks and sweets (SSs) and SSBs
- To identify factors associated increased expenditure and consumption of UPFs in Nepal.
- To examine the association of expenditure on UPFs and micronutrient rich foods





METHODS

- Data for this analysis are extracted from three rounds of a nationally representative survey, the POSHAN Community Studies survey (n=11,952 pooled) in Nepal.
- This is a nationally representative panel study in 21 districts (VDC) across 3 agro-ecological zones of Nepal.
- Household food expenditure (FE) data were collected for a 30-day period
- Forty foods were included in the survey module





METHODS

- The expenditure data for three survey panels (2013, 2014 and 2015) were standardized to food expenditure (FE) per capita/week.
- SSBs include sodas, juices and tea
- SSs include fried savory snacks and chips
- Micronutrient rich foods (MnRF) include animal source foods, vitamin A rich fruits and vegetables, other fruits and vegetables
- Percentage of households reporting expenditure on SSBs, SSs, MnRF
- Per capita/week FE
- Food Share of Total food expenditure (%)
- Spearman's correlations between SSBs, SSs, wealth and education was computed. Ordinary least squares and fixed effects models used.





	Descriptives (Pooled n=11,952)	
	Sugar sweetened beverages (SSB)	Snacks and sweets (SS)
	Median (IQR)	Median (IQR)
Percentage of households (%)	88.92%	87.78%
Food Share %	5.26% (6.88%)	3.47% (4.69%)
Expenditure per capita per week (US dollar)	0.188 (0.346)	0.125 (0.205)
Expenditure per capita per week (US dollar) by Wealth Index		
1	0.075 (0.186)	0.083 (0.163)
2	0.125 (0.227)	0.10 (0.175)
3	0.194 (0.329)	0.125 (0.208)
4	0.250 (0.425)	0.138 (0.188)
5	0.349 (0.452)	0.188 (0.288)
Expenditure per capita per week (US dollar) by household head education status		
<6 year	0.143 (0.271)	0.107 (0.208)
6-11 years	0.250 (0.385)	0.150 (0.250)
12+ years	0.425 (0.522)	0.200 (0.292)



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FACTORS ASSOCIATED WITH UPF EXPENDITURE

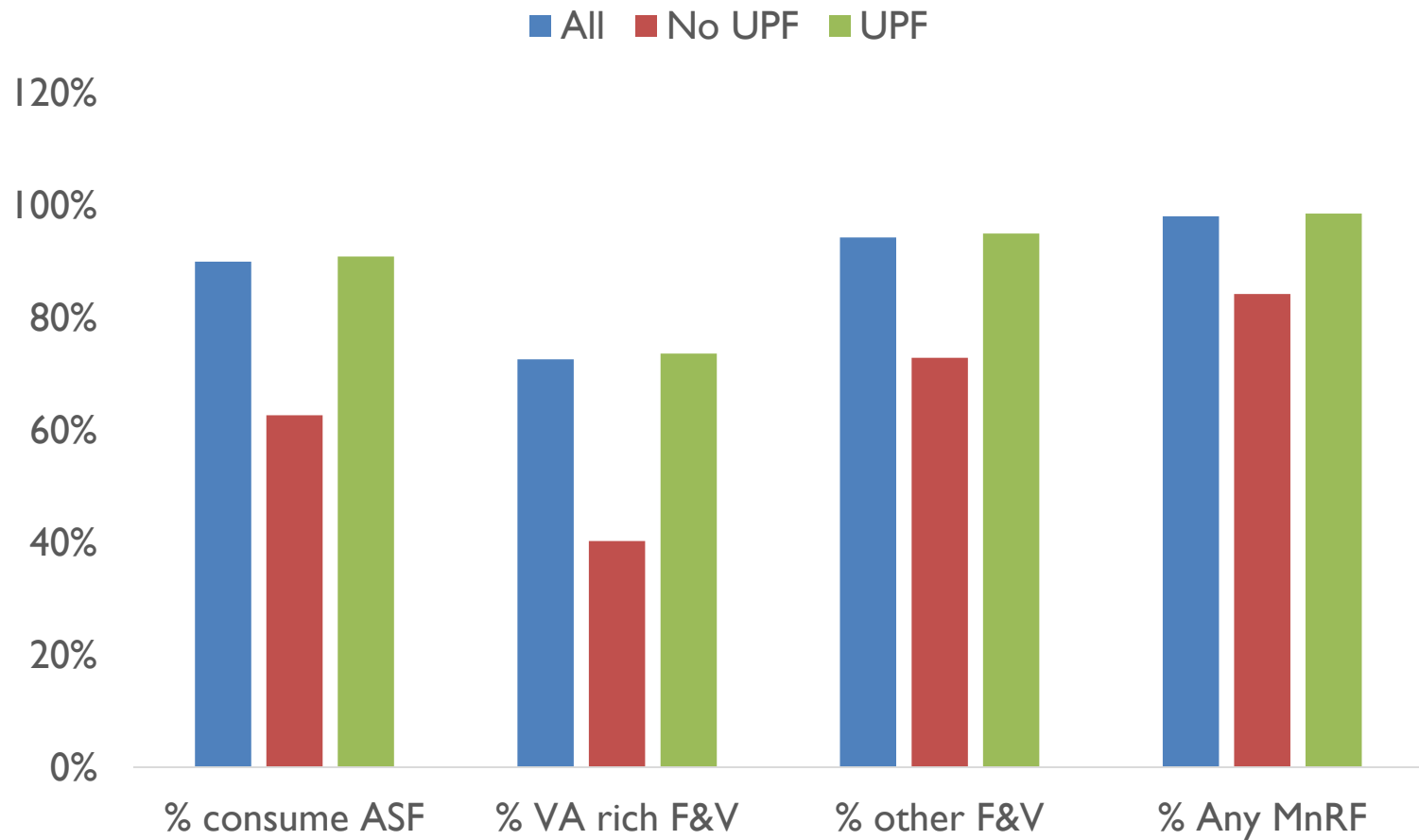
	Sugar Sweetened Beverages	Snacks and Sweets
Wealth Index		
Poorest	Ref	Ref
Second	0.0490 ^{**} (0.0151)	0.0172 (0.0107)
Third	0.127 ^{***} (0.0152)	0.0405 ^{***} (0.0107)
Fourth	0.249 ^{***} (0.0154)	0.0602 ^{***} (0.0109)
Richest	0.340 ^{***} (0.016)	0.144 ^{***} (0.0113)
Household Head Education		
< 6 years	Ref	Ref
6-11 years	0.0528 ^{***} (0.0117)	0.0316 ^{***} (0.00822)
>12 years	0.107 ^{***} (0.0187)	0.0786 ^{***} (0.0132)
Survey year		
2012	Ref	Ref
2013	-0.00908 (0.011)	0.00697 (0.00773)
2014	0.324 ^{***} (0.0129)	0.227 ^{***} (0.0091)
Agro-ecological Zone		
Mountains	Ref	Ref
Hills	-0.247 ^{***} (0.0169)	-0.0416 ^{***} (0.0119)
Terai	-0.304 ^{***} (0.0148)	-0.0439 ^{***} (0.0104)
Constant	0.335 ^{***} (0.018)	0.127 ^{***} (0.0127)
N	11952	11952
R ²	0.15	0.088

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

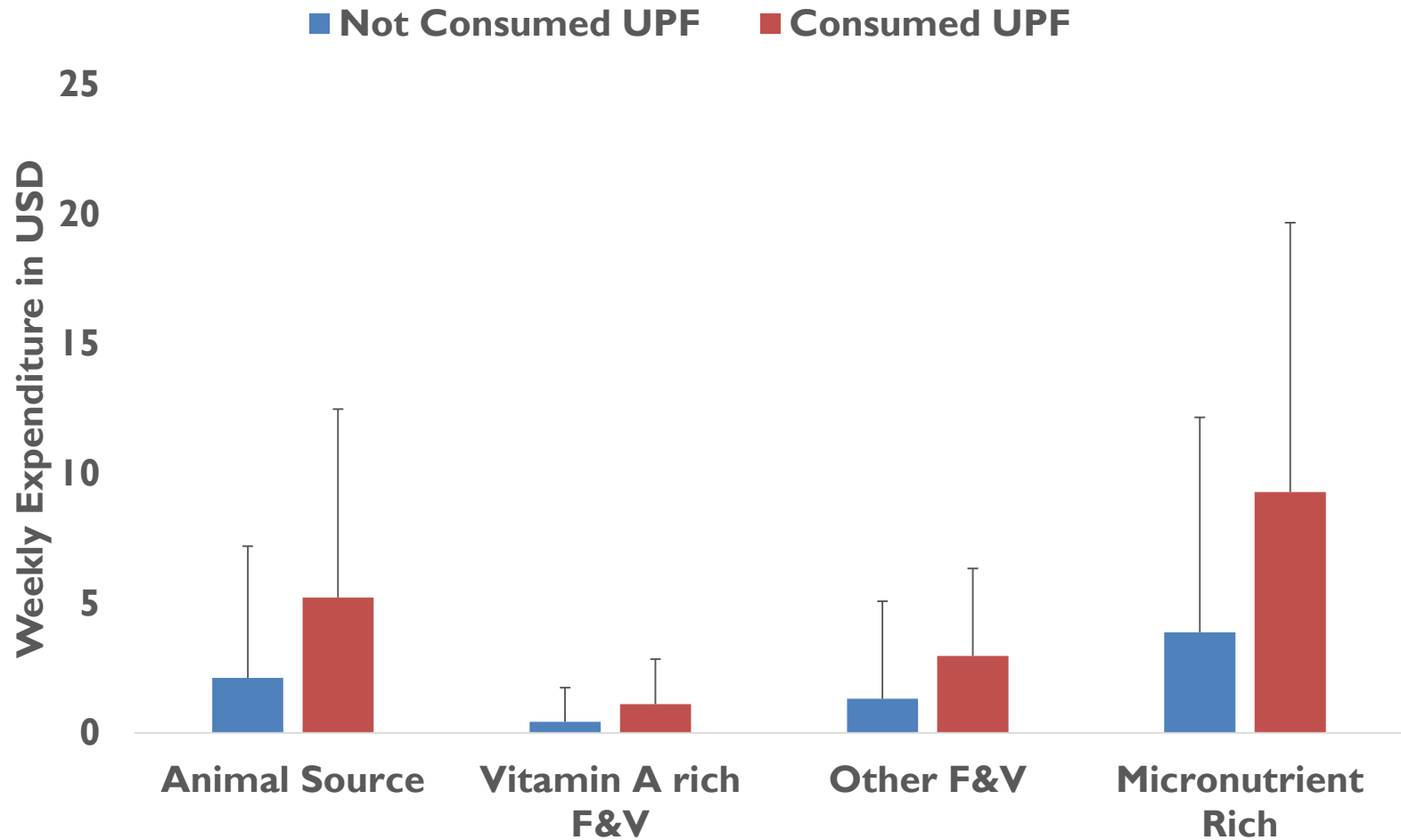


EXPENDITURE ON MICRONUTRIENT RICH FOODS RELATIVE TO EXPENDITURE ON UPF



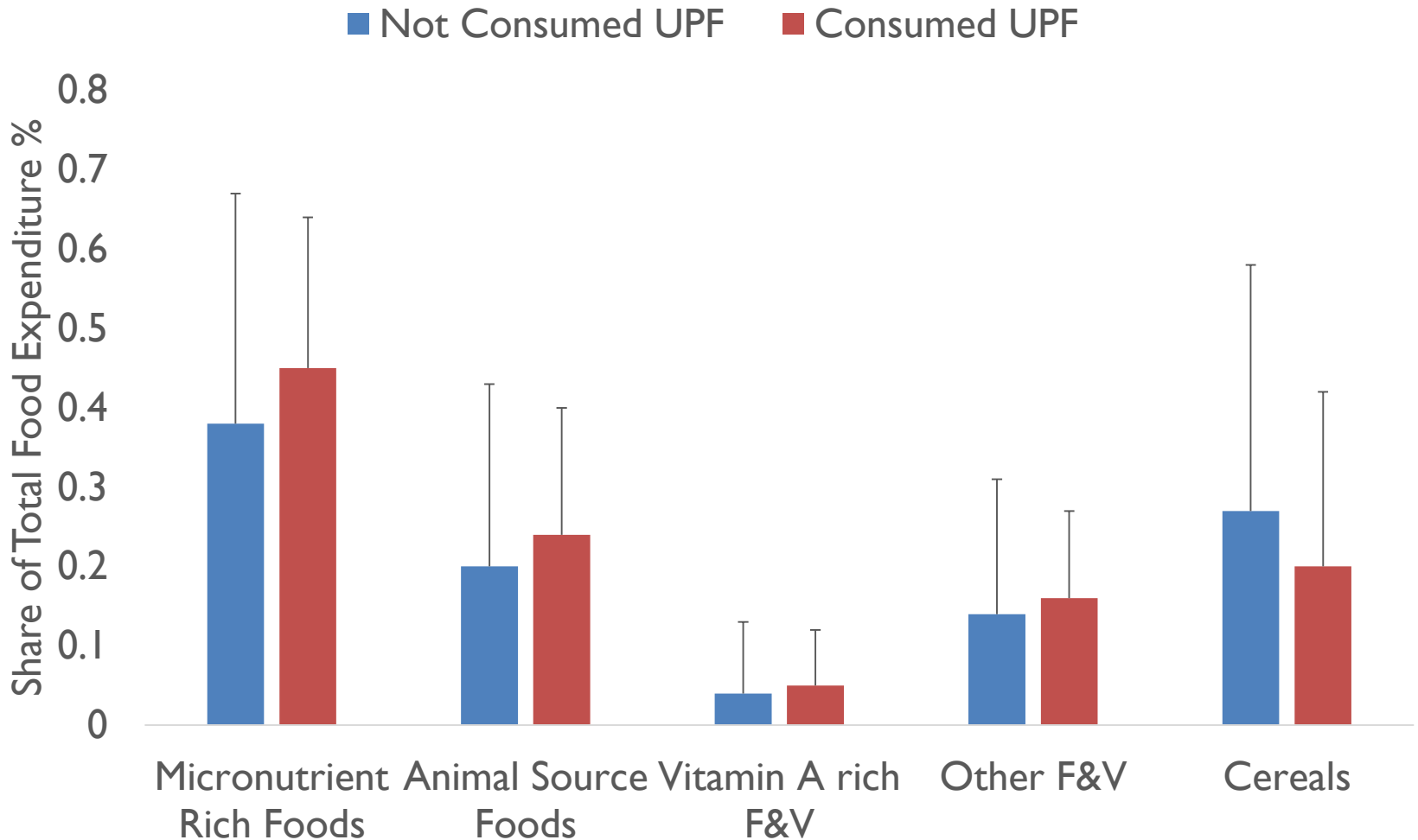


MICRONUTRIENT FOOD EXPENDITURE (TOTAL WEEKLY EXPENDITURE)





FOOD SHARE





ASSOCIATION BETWEEN TOTAL MICRONUTRIENT FOOD SHARE AND PROCESSED FOOD SHARE

		Ordinary Least Squares
Processed Food Share	β	-0.174 (0.0619)*
	<i>N</i>	11936
	<i>R</i> ²	0.161

SD in parentheses, * $p < 0.05$

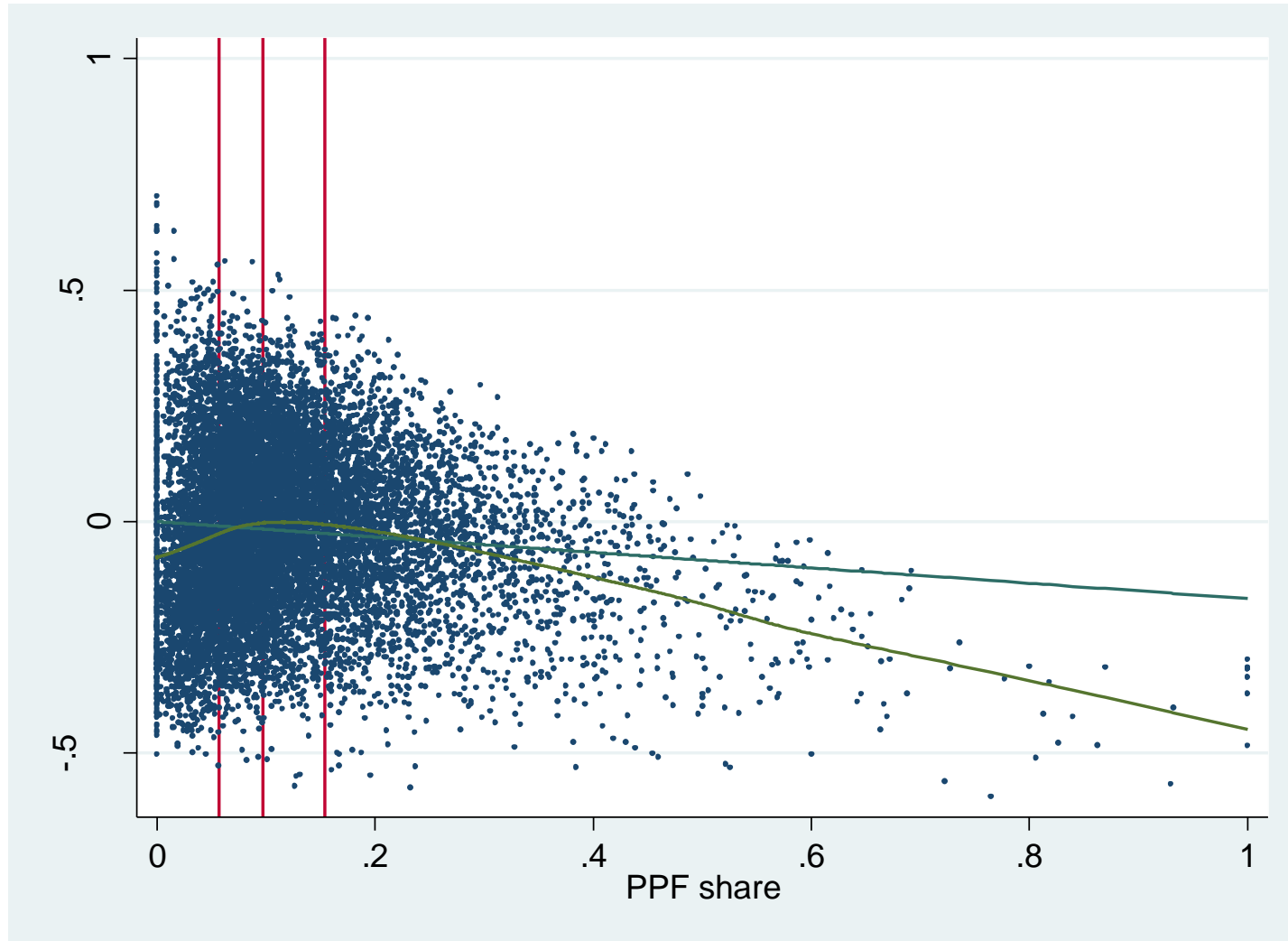
Controlling for Log per capita Expenditure, wealth index, survey year and agro-ecological zone



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MICRONUTRIENT RICH FOOD SHARE AS FUNCTION OF TOTAL PROCESSED FOOD SHARE controlling for log per capita expenditure, wealth index, survey year, agro-ecological zone





ASSOCIATION BETWEEN TOTAL MICRONUTRIENT FOOD SHARE AND PROCESSED FOOD SHARE (COMPARING OLS TO FIXED EFFECTS)

		Ordinary Least Squares			Fixed Effects model		
		All Data	Processed Food Share <median	Processed Food Share >median	Full	Processed Food Share <median	Processed Food Share >median
Processed Food Share	β	-0.174 (0.0619)*	0.969 (0.161)***	-0.489 (0.0481)***	-0.190 (0.0756)*	0.918 (0.201)***	-0.482 (0.0584)***

SD in parentheses, * p<0.05, **p<0.01, *** P<0.001

controlling for log per capita expenditure, wealth index, survey year and agro-ecological zone



CONCLUSIONS

- Almost 90% of households (urban and rural) reported purchasing sugar sweetened beverages and/or snacks and sweets
- This was strongly and positively associated with wealth and education status
- Households that consumed ultra processed foods seemed to also consume micronutrient rich foods
- However we found a negative association existed between purchase/food share of ultra processed foods versus micronutrient rich foods
- A non linear relationship between micronutrient rich food share and processed food share. The relationship being positive below the median and negative above the median.





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