The Vietnam urban food consumption and expenditure study

Factsheet 12: Are there relationships between food shopping behaviour and diet-related health outcomes for urban Vietnamese consumers?

The fast expansion of supermarkets, often referred to as "supermarketization" or a "supermarket revolution", has greatly reshaped the commercial food environment in developing countries. One concern related to modernisation of food systems, particularly food retailing, is that it will lead to diet transition, where minimally processed traditional foods are replaced by less healthy, calorie-dense processed foods.

Diets high in processed foods are often typically high in calories, saturated fat, and sodium, and these diets are associated with a number of non-communicable diet-related diseases. In this factsheet we explore this relationships between the use of modern food retailers and diet-related health outcomes.

In some environments, the movement of supermarkets into developing countries has had welfare implications and human health consequences associated with dietary change. Specifically, the increasing presence of supermarkets in some countries has been found to increase daily per capita calorie availability.

Further, processed foods, often available and regularly purchased from supermarkets (see Factsheet 5 for more information) allow consumers to pay less per calorie than more nutrient-dense fresh or raw products. While an increase in supermarket presence may enhance food security, it could also be obesogenic with increased consumption of energy-dense processed food at the expense of nutrient-dense fresh fruits and vegetables. Increased consumption of processed foods can result in obesity and other non-communicable diet-related (NCD) diseases.

Our results suggest some evidence of consumers shifting toward more calorie-dense foods and shopping at modern outlets as household incomes increase. For more information about the relationship between household incomes and types of foods purchased, refer to Factsheet 3. Retail outlets where consumers are making food purchases was explored in Factsheets 4 and 5.

In this factsheet we determine whether increased supermarket shopping in Hanoi and Ho Chi Minh City is having an influence on diet-related health outcomes for consumers. We explore this relationship using responses to questions included in the survey to capture the age, height and weight of each household member. In addition, the survey included questions that asked consumers to detail their food expenditures and locations where expenditures were made for the month leading up to the survey. More information about our methods to calculate expenditures is contained in Factsheet 3 and Factsheet 4.

We use the height and weight information of each household member (in every household) to calculate the body mass index (BMI) for each individual. Following this we estimated BMI z-scores – the group-demeaned BMI divided by the group standard deviation, where

the group is defined as individuals with the same gender and age[1].

We do not see an obvious impact of increased food expenditures at supermarkets and weight outcomes for the overall <u>adult</u> sample of respondents in Hanoi and Ho Chi Minh City (Table 1). However, when we examine BMIs of children (<18 years old) we found the average BMI for children in the sample to be 18.6. We define a child as 'overweight' if the individual's weight-for-height is greater than 2 standard deviations above the WHO Child Growth Standard median for children. Using this definition, **5% of the children in the sample were overweight.**

A significant subsample impact exists for girls aged 6-9 years of age and for girls from upper middle-income households in terms of changes in both BMI and overweight status (Table 1). Specifically, for girls aged 6-9 and girls from upper middle-income families **there was a positive relationship between supermarket food expenditures and weight outcomes**, i.e. the greater the household's share of monthly food expenditure at a supermarket the higher the BMI or more likely the girl is to be overweight. **For girls aged 6-9 and girls from upper middle-income households, a 1% increase in supermarket food expenditure share raises the probability of being overweight by 0.003.** Although this is small, it is statistically significant.

To further interpret the subsample weight impacts we using BMI z-scores, let us think of a seven year-old girl with a height of 1.2 metres and a weight of 26.7 kilograms. For this age group our estimated impact of a 1% increase in supermarket food expenditure share is associated with a weight gain of 0.12 kilograms. On the other hand, a girl from an upper middle-income household aged 9 years-old with a height of 1.3 metres and a weight of 32.6 kilograms would be relatively close to the average for the sample. For this girl, our estimates suggest that a 1% increase in supermarket food expenditure share would be associated with a weight gain of 0.11 kilograms.

Though no strong positive relationships between increased shares of food expenditures being directed to supermarkets and weight were identified for adults, these results do show important patterns beginning to take place for children, particularly for younger children in higher income households.

Increased supermarket food expenditure shares have been linked to diet-related health issues, such as obesity in other Southeast Asian countries e.g. Indonesia. Indonesia has a more advanced modern retail system than Vietnam but, if Vietnam's retail market continues to develop rapidly, consumption and diet-related outcomes could soon be significant issues.

We must also acknowledge that whilst this food system transition is occurring, undernourishment and micronutrient deficiency still exist in Vietnam, particularly in low-income households and many rural areas. **These results could indicate that we may see a significant situation in the near future where under-nutrition co-exists with over-nutrition in Vietnam.**

We must also acknowledge that other factors influence food consumption and shopping behaviour (such as increasing disposable incomes (affluence), culture, and environmental factors) and increased supermarket shopping does not always lead to excessive consumption of highly processed foods. However, these early research results suggest potential issues and may be of interest to policy makers who aim to address or prevent diet-related diseases.

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[1] For a detailed description of the methodology used and more information refer to: Zeng, D., Umberger, W.J., Rupa, J. 2017. Implications of Supermarket Revolution on Weight Outcomes of Vietnamese Urban Consumers, *Agricultural & Applied Economics Association Annual Meeting*, 30 July 30–1 August 2017, Chicago, United States.

Table 1. Subsample impacts of supermarket food expenditure share on BMI z-score[1,2] for consumers in Ho Chi Minh City and Hanoi, Vietnam.

		Adults		Children	
		Male	Female	Male	Female
Gender		**0.071**	**0.295**	**-0.136**	**0.558**
		(0.270)	(0.234)	(0.396)	(0.359)
Age (years)	2-5			**-0.184**	**-1.352**[*]
				(0.629)	(0.742)
	6-9			**-0.536**	**1.544**[***]
				(0.907)	(0.582)
	10-17			**0.189**	**0.975**[*]
				(0.600)	(0.548)
	18-34	**0.107**	**0.531**		
		(0.441)	(0.400)		
	35-54	**0.056**	**0.178**		
		(0.341)	(0.313)		
	55-65	**-1.217**	**0.349**		
		(0.796)	(0.884)		
Household income	Low (1st quantile)	**0.200**	**0.766**	**-0.198**	**-0.249**
		(0.505)	(0.471)	(0.789)	(0.646)
	Lower middle (2nd quantile)	**0.171**	**0.404**	**-0.419**	**0.048**
		(0.635)	(0.560)	(0.782)	(0.773)
	Upper middle (3rd quantile)	**0.578**	**0.337**	**-0.220**	**2.219**[***]
		(0.499)	(0.447)	(0.654)	(0.659)
	High income (4th quantile)	**-0.387**	**-0.073**	**0.894**	**-0.085**
		(0.522)	(0.417)	(1.161)	(0.763)

[1] Each coefficient estimate of supermarket food expenditure share comes from a separate regression where the outcome variable is BMI z-score.

[2] Standard errors are reported in parentheses. [*], [**] and [***] indicate statistical significance at 10%, 5% and 1% levels, respectively.