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InfoNote

Nutritional status of adults and children under 5 years of age in two areas of Guatemala

Project results for "His and Hers, time and income: how intra-household dynamics impact nutrition in agricultural households"

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Introduction

In this info-note, we explain the body mass index calculations (BMI) for adults in agricultural Guatemalan households, as well as the implementation of indicators to assess the nutritional status of children under 5 years (height for age, weight for age and weight for height). This work is part of the project "His and Hers, time and income: How intra-household dynamics impact nutrition in agricultural households," led by the International Center for Tropical Agriculture (CIAT) and the University de Florida [1] with funding from the program Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA).[2]

The prevalence of stunting in Guatemalan children under 5 years is 46 percent, according to Guatemala's Ministry of Public Health (INE, 2015). Stunting refers to insufficient height with respect to age. It is a consequence of inadequate socioeconomic conditions that are often associated with insufficient nutrition and health of the mother, which is in turn reflected in inadequate care of the infant. Stunting prevents children from fully developing their physical and cognitive potential (WHO, 2018). Simultaneously and paradoxically, Guatemala also shows a significant presence of overweight and obesity rates among its population. The prevalence of overweight in adults is 56% and of obesity is 21% (WHO, 2017).

Methodology

Data

The sample is equally distributed in two study sites in Guatemala: one site in the East (n=250), where the population is principally *mestizo* and one site in the West (n=250) where there is a strong indigenous influence. Both zones have similar poverty levels (INE, 2018) and most inhabitants are mainly coffee producers.

Nutritional status of adults

BMI was used to evaluate the nutritional status of adults, specifically in terms of underweight, overweight and obesity. To do so, the anthropometric measurements (weight and height) were collected from each household's main couple through standardized protocols and by trained interviewers.

To calculate the BMI, the variables used were weight in kilograms and height in meters. The BMI is calculated by dividing the kilograms of weight by the square of the

height in meters (kg / m^2). The result is categorized as underweight if it shows a BMI <18.5; normal weight BMI 18.5 - 24.9; overweight BMI 25.0-29.9; and obesity BMI > 30.0.

Nutritional status of children under 5 years

Anthropometric measurements (weight and height) were completed for the youngest children, who were between 6 months and 5 years of age (n=105). Based on these measurements and the child's age, the growth indicators were obtained: length/height for age, weight for age and weight for length/height. A child could show deficiency in various indicators at once, for example, stunted growth and underweight for age. Growth charts from the World Health Organization (2006), which reflect a wide range of ethnic background and cultural settings, were used as reference values (WHO, 2006). Children were excluded from analysis if data of length/height, weight or age were missing or if child's HAZ and/or WAZ were below -6 or above +6; WHZ was below -5 or above +5. These extreme values reflect possible measurement or entry errors. In Table 1, below, the reference values and the different indicators can be observed.

Table 1. Summary of anthropometric indices in children under 5 years

Indicator	Measurement	Classification (z-score)
Length/Height for age (haz)[3]	Stunting	<-2 SD stunting
Weight for age (waz)	Underweight	<-2 SD underweight
Weight for lenght/height (whz)	Wasting Overweight Obesity	<-2 underweight >+2 overweight >+3 obesity

Results

Adults

In total, data was collected from 481 adults, 241 men and 240 women. Overweight and obesity were observed in both zones (Figure 1). Overall, the prevalence of overweight and obesity combined appeared significantly greater in women (59%) than men (39%). When combining the cases of overweight and obesity for both

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[3] Children less than two years old were measured lying down; therefore, depending on child's age we had high or length measurements.

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sexes, the prevalence was observed to be greater in the West in comparison with the East (57% and 42% respectively; p=0.004). The prevalence of underweight was relatively small for both sexes in both areas (< 2%) and absent for men in the East.

Figure 1. Nutritional status of adults by BMI by sex and area

Underweight (BMI <18.5) Normal (BMI 18.5-24.9)
Overweight (BMI 25.0 -29.9) Obesity (BMI >30.0)
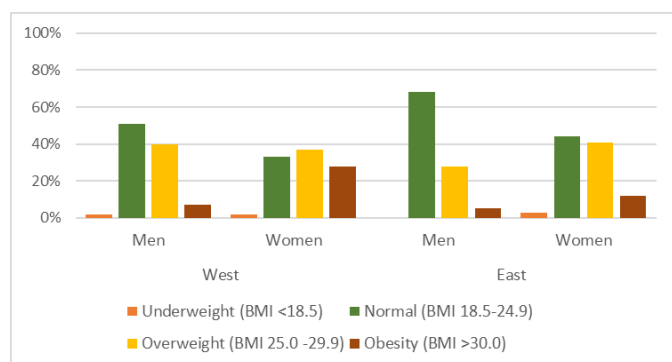
Children

Results were stratified by area, underweight was significantly higher in the east compared to the west (p=0.003). The rest of indicators did not show any difference between areas.

West
Out of 49 children, 94% were included for analyses, the rest were excluded since height or weight measures were not complete. The prevalence of children with stunted growth was 44%, while the prevalence of children underweight was 9%. Although no children fell into the overweight category, there were two cases of obesity.

Table 2. Nutritional status of children by year (months) in the west (N = 46)

Indicator	Age (months)		
	6-11 (n = 9)	12-23 (n=12)	24-35 (n=15)
Length/height for age (n=41)			
Stunting	2 (22%)	4 (40%)	7 (54%)
Normal growth	7 (78%)	6 (60%)	6 (46%)
Weight for age(n=45)			
Underweight	0	1 (9%)	1 (7%)
Normal weight for age	9 (100%)	10 (91%)	14 (93%)
Weight for length/height (n=46)			
Wasting	0	0	0
Normal weight for height	9 (100%)	11 (92%)	15 (100%)
Overweight	0	0	0
Obesity	0	1 (8%)	0

Indicator	Age (months)		
	36-47 (n=7)	48-60 (n=3)	Total (n=46)
Length/height for age (n=41)			
Stunting	4 (67%)	1 (33%)	18 (44%)
Normal growth	2 (33%)	2 (53%)	23 (56%)
Weight for age(n=45)			
Underweight	1 (14%)	1 (33%)	4 (9%)
Normal weight for age	6 (86%)	2 (67%)	41 (91%)
Weight for length/height (n=46)			
Wasting	0	0	0
Normal weight for height	6 (86%)	3 (100%)	44 (96%)
Overweight	0	0	0
Obesity	1 (14%)	0	2 (4%)

East
Of total children (n=57), 95% were included for analyses. As seen in Table 3, the indicator with the highest prevalence was stunting, since one in every two children presented it. Eleven percent were underweight and two cases were found of overweight children.

Table 3. Nutritional status by age (months) in the east (n=54)

Indicator	Age (months)		
	6-11 (n = 7)	12-23 (n=17)	24-35 (n=9)
Length/height for age (n=51)			
Stunting	5 (71%)	9 (53%)	3 (43%)
Normal growth	2 (29%)	8 (47%)	4 (57%)
Weight for age			
Underweight	2 (29%)	1 (6%)	0
Normal weight for age	5 (71%)	16 (94%)	9 (100%)
Weight for length/height			
Wasting	0	0	0
Normal weight for height	7 (100%)	16 (94%)	8 (89%)
Overweight	0	1 (6%)	1 (11%)
Obesity	0	0	0

Indicator	36-47 (n=14)	48-60 (n=7)	Total (n=54)
Length/height for age (n=51)			
Stunting	5 (38%)	3 (43%)	25 (49%)
Normal growth	8 (62%)	4 (57%)	26 (50%)
Weight for age			
Underweight	3 (21%)	0	6 (11%)
Normal weight for age	11 (79%)	7 (100%)	48 (89%)
Weight for length/height			
Wasting	0	0	
Normal weight for height	13 (100%)	7 (100%)	51 (96%)
Overweight	0	0	2 (4%)
Obesity	0	0	

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Discusion

The study's results reaffirm the seriousness of the double burden of malnutrition in Guatemala, where the presence of chronic malnutrition in children under 5 years of age coexists with the prevalence of overweight and obesity in adults. The data allows us to understand the distribution of two zones (East and West) that show geographic differences and reveals the nutritional status of adult men who have an essential role in the family's nutrition and are rarely considered in other nutritional studies.

To conclude, there exists a prevalence of overweight and obese adults for both zones. Although it is more pronounced in women. The most prevalent form of malnutrition in children was stunting followed by low weight for age and overweight and obesity.

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