Policy Research Working Paper 10170

Intra-Household Inequality in Food Consumption and Diets in the Philippines

Felipe Dizon
Anna Josephson
Zetianyu Wang

WORLD BANK GROUP
Agriculture and Food Global Practice
September 2022

Policy Research Working Paper 10170

Abstract

Most welfare measures, including food expenditure and diet quality, are based on household aggregates and assume an equal or equitable distribution of resources among members within the household. But it is unlikely that resources are distributed equally or equitably within most households. As such, individual food expenditure and diet quality measures, rather than household aggregations, may paint a more accurate picture of intra-household welfare. This paper assesses the disparity between household and individual measurement of food expenditure and diet quality in the Philippines using data from 2013. It finds evidence of intra-household inequality for food expenditure and for diet quality. In particular, for the consumption of starchy staples, meat, fish, and legumes, women and children do not meet the recommended consumption, even within households that, in aggregate, are able to meet the recommended consumption. However, intra-household inequality is not observed under circumstances in which no one in the household meets recommended consumption, as is the case for many food categories in our analysis.

This paper is a product of the Agriculture and Food Global Practice. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at fdizon@worldbank.org.

Intra-Household Inequality in Food Consumption and Diets in the Philippines

Felipe Dizon[1], Anna Josephson[2], and Zetianyu Wang[3*]

JEL Classification: O15, D13, I14

Keywords: intra-household, inequality, food consumption, nutrition, the Philippines

[1] Senior Economist, Agriculture and Food Global Practice, World Bank, fdizon@worldbank.org
[2] Assistant Professor, Department of Agricultural and Resource Economics, University of Arizona, aljosephson@arizona.edu
[3] Doctoral Candidate, Pardee RAND Graduate School, zetwang@prgs.edu
[*] Authors listed alphabetically by surname. This research was funded by the Scaling Up Nutrition Trust Fund, Grant No. TF0A8125 for Improving Nutrition Service Delivery in the Philippines. All remaining errors are our own. The findings, interpretations and conclusions expressed herein are those of the authors and do not necessarily reflect the view of the World Bank Group, its Board of Directors, or the governments they represent.

1. Introduction

Standard welfare measures are based on household consumption and assume an equal and equitable distribution of resources among family members. This presumes that households either distribute resources equally among all family members (equal) or according to the respective dietary or nutrition requirements of all respective family members (equitable). However, existing literature has demonstrated that neither equal nor equitable distributions are observed for most households (Udry, 1996; Brown et al., 2017) and the inferior outcomes of many, particularly women, have been documented (Oster, 2009; van de Walle, 2013). However, disparate intra-household distributions may extend further, to differences in the quality and nutritional value of foods consumed between family members. This may ultimately affect nutrition and health outcomes (Coates et al., 2018; Harris-Fry et al., 2018; D'Souza & Tandon, 2020; Brown et al., 2021; De Vreyer & Lambert, 2021).

Due to the potential biases associated with these household-level aggregations, welfare metrics and measures of food consumption and diet quality which are based on individuals may depict a more accurate picture of the conditions of these individuals within households. This has the potential to improve policy recommendations which may otherwise be skewed if everyone in a household is assumed to be allocated equal or equitable resources. There is a growing literature that indicates that the cost of nutritious diets is quite high, suggesting that we may gain richer insight from assessing inequalities in diet quality as opposed to only inequalities in food expenditure (Dizon et al., 2019; SOFI 2020).

In this paper, we assess the extent of disparity between household and individual measurement of food expenditure and diet quality in the Philippines. We use the National Nutrition Survey (NNS) from the Philippines in 2013, which includes an extensive accounting of consumption for 18,472 individuals, residing in 4,213 households. To better understand intra-household food expenditure and diet quality in the Philippines, we estimate individual- and household-level food expenditure and food consumption, and then compare these across different individuals within a household. We seek to answer two questions. First, do individuals with low food expenditure live in households with low food expenditure? Second, do individuals with poor quality diets live in households with poor quality diets? In this paper, we categorize food expenditure into five quintiles. We also categorize individuals as having above or below the median food expenditure.

Whereas poor diet quality is defined as consumption of a given food category which falls below the recommended grams of consumption for that category. We assess six food categories: i) starchy staples; ii) vegetables; iii) fruits; iv) eggs; v) proteins including meat, fish, and pulses; and vi) milk and milk products.

In the case of our first question, we find that approximately over half of individuals are aligned with their household: across all age and gender categories, about 35 percent of individuals consume above the median *individual* food expenditure and reside in households which are also above the *household* median food expenditure. Similarly, just under 20 percent of individuals consume below the median individual food expenditure and reside in households which are below the median household food expenditure. This means, however, that close to half of individuals are not aligned with their household: that is, 18 percent of individuals consume *below* median individual food expenditure, but reside in households which consume *above* the median household food expenditure; and 28 percent of individuals consume *above* the median individual food expenditure, but reside in households which consume *below* the median household food expenditure. These findings suggest that although many individuals are classified the same way as their households, many individuals would be classified differently than their household.

Turning to our second question, we demonstrate that intra-household inequality in food consumption exists but not for all food categories. We find that most people are anyway not consuming the recommended amounts of certain food categories. This is the case for vegetables, fruit, eggs, and milk and milk products. That is, consumption for these items is low for all types of individuals. There are exceptions to this and in these circumstances of exception, we observe that intra-household inequalities do exist. In these households, some – but not all – household members meet recommended requirements for food products. Men are the most likely to meet their requirements, while women and children are the least likely to meet their requirements for the same food. This is the case for proteins (meat, fish, and legumes), as well as for staple crops. Since these items for which inequalities exist typically form a larger share of the food expenditure basket, the same inequalities may be driving the food expenditure inequalities mentioned above.

This work is set in the Philippines, a rapidly urbanizing lower-middle income country. Only about 23 percent of people in the country have agricultural employment, making this context distinct

from similar analyses set in nations with a much higher rate of agricultural participation (and correspondingly, increased caloric requirements). As people in the Philippines have moved out of agricultural labor and into the industry and service sectors, poverty rates and the Gini coefficient have declined. But, despite these advances, individuals and families in the Philippines continue to struggle with undernutrition. There has been almost no reduction in the prevalence of undernutrition in the country in three decades (Mbuya et al., 2021).

The choice of using Philippines data is in large part due to the availability of individual-level consumption data, for all members of the household, as collected in the NNS in 2013. The NNS allows us to directly compare individuals' within-household consumption, which is uncommon among household data, particularly in low-income countries. Despite the importance of food consumption and/or dietary data for understanding important questions of health and intra-household dynamics, there are very few examples of nationally representative individual-level dietary surveys outside North America and Europe. A notable exception to this is the Bangladesh Integrated Household Survey (BIHS), which has nationally representative data on dietary intake of surveyed household members (for work using these data, see Brown et al. (2021), D'Souza and Tandon (2019)). However, these sorts of data are still relatively rare. Coates et al. (2017) highlight a few of the challenges with collecting and using individual consumption surveys. These include the lack of infrastructure required to facilitate the collection of these data. This problem is compounded by the often-significant time and cost mandated in their collection. As a result, there are relatively few individual-level data sets which analyze consumption for all those within a household. For researchers, this lack of data can pose a serious challenge for assessing and monitoring individuals' welfare across the world. Dang et al. (2019) create a typology of consumption data, which classifies household survey data as either entirely missing individual consumption data; partially missing such data, as in a case in which the data is only available for certain administrative areas; or missing such data over time. The NNS is thus an advantageous data set as it provides a unique opportunity to investigate questions of individual consumption and expenditures within a household, which is not possible in most other contexts.

Our findings extend the existing literature on intra-household dynamics and the value of individual welfare estimates. Standard welfare measures rely on household per-capita consumption metrics, which assume equal allocations among family members (World Bank, 2015). This is the case,

despite much of the existing literature on intra-household inequality, which finds that resources are not distributed equally among family members. This extends across a variety of resources, including assets, factors of production, investments, and food. Udry (1996) was among the first to explore these dynamics in a low-income country context. He explores assumptions of Pareto efficiency within agricultural households, in particular that input factors will be allocated efficiently across plots. He finds in Burkina Faso that women farmed much less intensively and households experience output losses because of this inefficient factor allocation. More recently, Josephson (2022) extends standard household models to include the collaborative labor and resources, but still finds that households in Malawi do not completely pool resources, though they do exhibit a strategic pooling behavior when faced with transient shocks.

The inequities in intra-household resource allocation have often been observed to affect vulnerable groups the most. While women and children are most frequently affected by inequalities and inequities in resource allocation (e.g., for food and nutrients in Bangladesh (Brown et al., 2021; D'Souza and Tandon, 2019); for health care (Oster, 2009), breastfeeding (Jayachandran and Kuziemko, 2011), and other resources in India (Lancaster et al., 2008); for invisible nutrients in Ethiopia (Coates et al., 2018)), other work has shown further disparities for other subgroups. This includes widows and older women (e.g., widows in India (Chen and Drèze, 1992; Drèze and Srinivasan, 1997), in Mali (van de Walle, 2013); older women in India (Calvi, 2020)), orphans (e.g., across Sub-Saharan Africa (Bicego et al., 2003; Evans and Miguel, 2007); in education (Ainsworth and Filmer, 2006)), and pregnant and lactating mothers (e.g., for food in Nepal (Harris-Fry et al., 2018); for calcium (Cormick et al., 2019)). These inequalities thus effectively extend and perpetuate ingrained inequalities and inequities.

Though beyond the scope of this current work, several recent extensions of this work focus on inequitable distributions of resources and sometimes further extend to explore individual-level poverty. Brown et al. (2017) find that undernourished women and children are spread across the household wealth and consumption distributions. This is the case in 30 countries in Sub-Saharan Africa. Further, the authors find evidence that nations with higher undernutrition are associated with a higher share of undernourished people in non-poor households. Both D'Souza and Tandon (2019) and Brown et al. (2021) consider similar analysis in Bangladesh, with similar conclusions. D'Souza and Tandon (2019) find that there are substantial inequalities in intra-household

distribution of food and nutrients, with male household heads consuming disproportionately large shares. Brown et al. (2021) also find evidence of what the authors identify to be severe poverty misclassification, particularly among women and children, with one-third of poor individuals living in non-poor families. De Vreyer and Lambert (2021) find that inequities in households result in an under-classification of inequity and poverty levels in Senegal. They further conclude that these intra-household inequalities account for more than 10 percent of inequality.

In this work, we make several contributions to this literature on intra-household inequality, with a focus on food consumption and diet quality. Our first contribution is to document the existence and to quantify the extent of some types of intra-household inequality in the Philippines. Our second contribution is to estimate and explore further the areas in which there are discrepancies between individual- and household-level food expenditure and diet quality. Our conclusions from this work emphasize the importance of examining intra-household discrepancies in food consumption. From this, we can draw some policy conclusions related to welfare measurement and the targeting of safety nets and nutrition programs. Intra-household inequality may result in welfare outcomes disparate from what standard estimates might otherwise suggest. We extend this further, quantifying the extent of these discrepancies and determining those within the household most likely to be impacted. Although most programs broadly seek to help disadvantaged households, our findings indicate that individual-based measurement can ensure better targeting of individuals with inadequate food consumption and poor diet quality.

2. Data

2.1 Context

This work is set in the Philippines, an archipelago in Southeast Asia. Classified as a lower-middle income country by the World Bank, the Philippines has a rapidly growing economy, with increasing urbanization and an expanding middle class. The economy is rapidly urbanizing, with a decreasing share of people living in rural areas. Only about 23 percent of people are employed in agriculture; agriculture contributes an average of 10 percent to national GDP (World Bank, 2022). Over the course of the last decade, with these sectoral changes, poverty rates have significantly declined from about 23 percent in 2015 to 17 percent in 2018. Over the same period, the Gini coefficient declined from 44.9 to 42.7 (World Bank, 2021).

Despite declining poverty rates and rising living standards, the Philippines continues to struggle with food insecurity and undernutrition. Around 65 percent of individuals across the country struggle with chronic food insecurity. This breaks down to 39 percent of individuals experiencing mild food insecurity, 17 percent of individuals experiencing moderate food insecurity, and 8 percent of individuals experiencing severe food insecurity (IPC, n.d.). Further, according to Mbuya et al. (2021), there has been almost no reduction in the prevalence of undernutrition for 30 years. Nearly 30 percent of children younger than five suffer from stunting, with some regions suffering from rates greater than 40 percent. Micronutrient deficiency is also prevalent, including anemia and vitamin A deficiency (Mbuya et al., 2021).

Undernutrition and food insecurity tend to most affect vulnerable peoples, including landless poor households, indigenous peoples, and individuals engaged in irregular income livelihoods (IPC, n.d.). Additionally, many individuals living in the Philippines are subject to regular and severe climate shocks, including flood, landslides, drought, and typhoons, all of which cause compounding stresses on ensuring food and nutrition security for households. The Philippines' rapid growth and urbanization further threatens the tenuous food security which exists. As the Philippines continues to grow, good nutrition will be imperative for ensuring continued economic prosperity. Addressing undernutrition will increase human capital and will improve the lives of individuals throughout the nation.

2.2 National Nutrition Survey

As we are interested in household nutrition and intra-household consumption, our primary analysis is based on the National Nutrition Survey (NNS) of the Philippines. The NNS is a nationwide survey on nutritional status, diet, and other factors related to noncommunicable disease. The NNS data are nationally representative within each cross-section collected (Patalen et al., 2020).

The NNS in 2013 is a unique data set, due to the availability and richness of the individual-level consumption data. Despite the value of food consumption and/or dietary data, there are very few examples of nationally representative individual-level dietary surveys outside North America and Europe. There are significant challenges to collecting such data (Coates et al., 2017). And, as a result, there are relatively few individual-level data sets which analyze consumption for all those

within a household. Consequently, this lack of data can pose a serious challenge for researchers and stakeholders in assessing and monitoring poverty and health for individuals across the world.

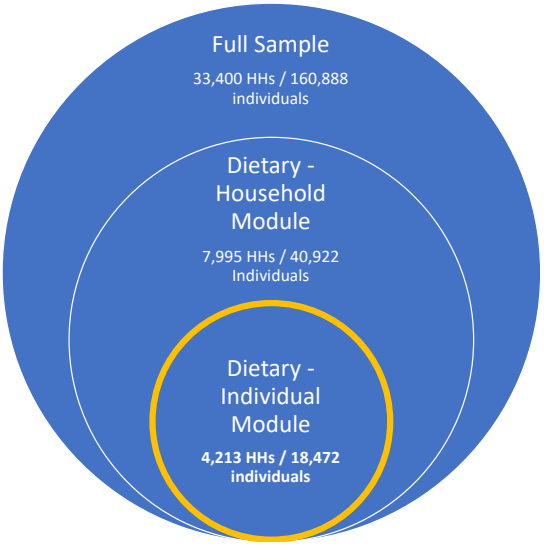
Most household consumption and dietary data can be classified as incomplete in one of three ways: (1) incomplete household survey data as either completely missing individual consumption data; (2) partially missing such data, as in a case in which the data is only available for certain administrative areas; or (3) missing such data over time (Dang et al., 2019). The NNS does not exhibit incompleteness in this way and provides an ideal opportunity to investigate questions of individual food consumption and expenditure within a household.

In our analysis, we use data from 2013 (hereafter NNS 2013), which includes the most recent and publicly available household and individual food consumption data. The NNS 2013 includes 10 modules: (1) Anthropometry, (2) Biochemical, (3) Clinical, (4) Dietary – Household, (5) Dietary – Individual, (6) Food Security, (7) Infant and Young Children Feeding, (8) Maternal Health and Nutrition, (9) Socio-Economic – Household, and (10) Socio-Economic – Individual. Note that the Dietary – Household module applied standard food weighting procedures and collected data on all meals (breakfast, lunch, dinner, and snacks) prepared and cooked in the house for all the household members, whereas the Dietary – Individual module conducted face-to-face interviews using a 24-hour Food Recall Form to collect food consumption at the individual level. Although more rounds of the NNS (such as the NNS 2015 and NNS 2018) were conducted after 2013, these more recent NNS are not ideal for this study. First, the NNS 2015 did not implement food consumption modules and second, the NNS 2018 was not publicly available at the time at which this work was undertaken.

The data includes 160,888 individuals, from 33,400 households, which were surveyed in NNS 2013. However, some modules were only asked of some subsets of the full sample. For example, the Infant and Young Children Feeding (IYCF) module included 4,628 individuals. This, though, approximately matched the number of infants and young children (0-23 months) in the full Individual Socio-Economic module (4,938). Further, the Maternal Health and Nutrition module included 6,232 women, which was also roughly in line with the number of pregnant women and mothers with the youngest child being 0-36 months in the Individual Socio-Economic module (6,419 individuals). Finally, and of most importance, the Dietary (Household) module only

covered 7,995 households, accounting for 24% of the total sample. But this module covered approximately 24% of households in each region. Similarly, the Dietary (Individual) module covered even fewer households (4,213), accounting for 13% of total households and 53% of households covered in the Dietary (Household) module. Ultimately, the overall demographic characteristics of those covered in this module were not significantly different from those of the full sample. A visualization of the final sample selection process is presented in Figure 1.

Figure 1. Final Sample Selection Process



We rely on the Family Income and Expenditure Survey (FIES) 2015 for price data. As only *quantities* of food group consumption were available in NNS 2013, food expenditures were imputed from the FIES 2015 from the Philippine Statistical Authority (PSA, 2020). These expenditures were used to derive prices (or unit values) of food groups surveyed in NNS 2013. More details on this process are in the subsequent section. However, as prices were in 2015, imputed food expenditures were adjusted to 2013 using the official CPI retrieved from the Philippine Statistical Authority. The CPI for 11 food groups in 17 regions was determined for both June 2013 and June 2015. Then CPI deflators were calculated and imputed food expenditures were determined for each food group in the appropriate region by their corresponding CPI deflators.[1]

[1] Food groups available for CPIs were not perfectly matched with food groups in NNS 2013. The CPIs of vegetables were assigned to expenditures on starchy roots and tubers, dried beans, nuts and seeds, green leafy and yellow

3. Method

3.1 Constructing Household Food Expenditure and Diet Quality

We first constructed household-level food expenditure. Using data from the FIES 2015 household expenditure module, we grouped individual food items surveyed in FIES 2015 into the same 19 food groups in NNS 2013.[2] Then, at the household level, we aggregated total consumption and total expenditure for each food group. Units were standardized to grams and pesos for consumption and expenditure, respectively. To determine household-level values, total expenditures were divided by total consumption to find the unit value of each food group. The unit value of a food group calculated by this approach was essentially the average prices of all food items within that food group weighted by their quantities consumed. This method of deriving unit values of food groups follows Deaton (1987).

Table 1. FBDG Recommended Food Intake

	Children 1-6	*Children 7-12*	*Teens 13- 19*	*Adults*	*Elderly*	*Pregnant & Lactating Women*
Rice, Rice Products, Corn, Root Crops, Bread, Noodles	162.5	250	350	325	262.5	306.25
Vegetables	42	42	300	300	300	375
Fruits	150	100	300	250	200	200
Eggs	25	N/A	50	50	50	50
Fish, Shellfish, Meat & Poultry, Dried Beans & Nuts	58.5	108.5	125	140	150	225
Milk & Milk Products	240	240	240	240	170	240

Note: FNRI only recommended number of servings instead of number of grams in their pyramid. Therefore, the authors have to make assumptions about serving size for each food group in order to convert number of servings to number of grams. The recommendations were given by FNRI separately for the pregnant and for the lactating women; we combined the two groups by taking the average recommendations.

vegetables, and other vegetables. The CPIs of fruits were assigned to expenditures on vitamin-C rich fruits and other fruits. The CPI for meat was assigned to expenditures on meat and meat products and poultry. The CPI for eggs, cheese and milk was assigned to expenditures on eggs, whole milk and milk products.

[2] The 19 food groups are: (1) rice and rice products, (2) corn and corn products, (3) other cereal products, (4) starchy roots and tubers, (5) sugar and syrups, (6) dried beans, nuts, and seeds, (7) green leafy and yellow vegetables, (8) other vegetables, (9) vitamin-C rich fruits, (10) other fruits, (11) fish and fish products, (12) meat and meat products, (13) poultry, (14) eggs, (15) whole milk, (16) milk products, (17) fats and oils, (18) beverages, and (19) condiments and spices.

We then calculate the median unit value across households in each region to determine unit values of food groups at the regional level. Next, we go back to the NNS 2013 data and calculate household-level expenditure by multiplying household food consumption (collected in the Dietary – Household module) by the corresponding regional unit value for each food group. Finally, household per adult male equivalent (AME) food expenditure is calculated by dividing total household expenditure by the household AME scale. The AME expresses the energy requirement of a household member as a multiple of an adult male's requirement (Weisell and Dop, 2012). We first assign an age-and-gender-specific AME scale to each household member assuming a moderate level of physical activity. Individual AME scales are then summed up within the household to determine the household-level AME scale. Measuring consumption by per AME instead of per capita allows for more accurate comparison of food consumption across households by taking into account the age and gender composition of household members. Having obtained household-level food consumption and expenditure, we derive the household-level food expenditure and whether a household achieved food intake recommendations. To gauge levels of food expenditure, we group households into quintiles of food expenditure and we compare against the median household food expenditure. Next, we calculate recommendations related to nutrition. Recommended food intakes were retrieved from the Daily Nutritional Guide Pyramid by the Food and Nutrition Research Institute of the Philippines (FNRI, n.d.). These recommendations were used to benchmark the food intake of populations of various ages.

Figure 2. Recommended Diet Pyramid for Adults

The Pyramid gives daily consumption recommendations for various food groups for the following seven age groups: (1) toddler (1-6 years); (2) children (7-12 years); (3) teenagers (13-19 years); (4) adults (20-59 years); (5) elderly (60 and above); (6) pregnant women; and (7) lactating women. Food-based dietary guidelines (FBDG) are defined for an adult male between 20 and 59 years old. That is, a household meeting the household FBDG requirement for fruits, for example, means that the household AME consumption for fruits is no less than the FBDG requirement of fruits for adult men between 20 and 59 years old. More details are provided in Table 1 and Figure 2.

3.2 Individual-Level Comparisons of Expenditure and Diet Quality

To determine intra-household differences in food consumption and expenditures and intra-household diet quality, we calculate individual-level food expenditure and food intake. First, following the method described above, we calculate individual-level food expenditure by multiplying individual food consumption (collected in Dietary – Individual module) by the regional unit value for each food group. Next, we divide individual food expenditure by the corresponding individual AME scale to derive per AME individual food expenditure. Finally, we define individuals as falling within the five income quintiles, as well as being above or below the median individual expenditure on food.

We identify an individual as having a poor diet if they do not meet the age-specific recommended requirements (FBDG) within a number of categories, including starchy staples; fruits; vegetables; proteins including meat, fish, and pulses[3]; and milk and milk products (see Table 1).

Based on these calculations, we then compare these individual figures against their household's respective food expenditure and diet quality. This allows us to assess an individual's level of food expenditure and diet quality relative to the status of their household.

4. Do people with low food expenditure live in households with low food expenditure?

We first consider the discrepancies between individual- and household-level food expenditure. Table 2 presents the average individual monthly food expenditures, by household per AME food expenditure quintiles. This helps gauge to what extent individuals' food expenditure aligns with

[3] Meat, fish, and pulses are grouped together to be consistent with the Philippines FBDG.

their household's food expenditure. Similarly, Table 3 presents the alignment and misalignment of food expenditure for a household and for an individual, against the median food expenditure.

Table 2: Average individual monthly food expenditure (in Philippine pesos), by household per AME food expenditure quantile

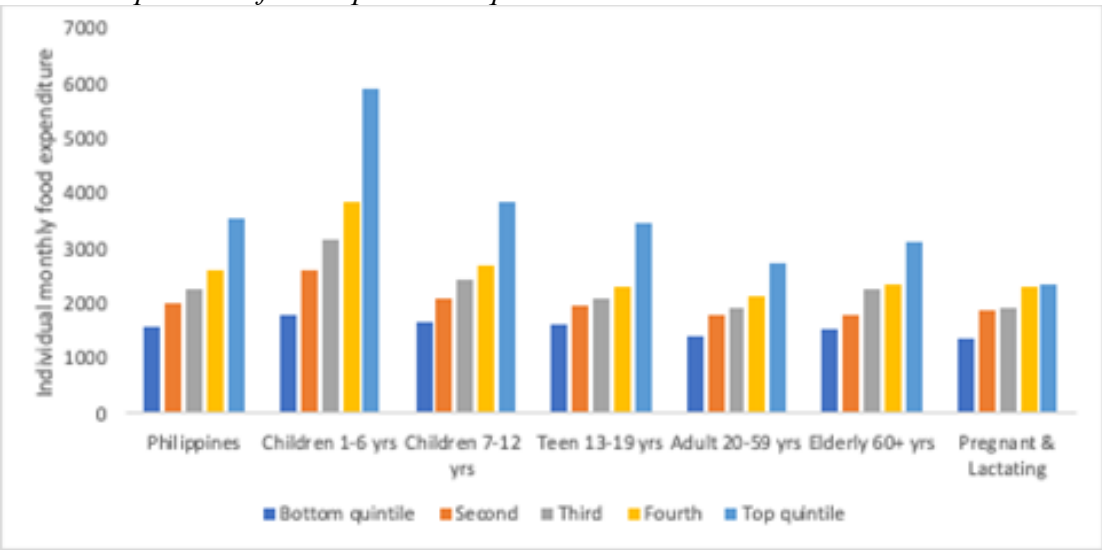
	Household per AME food expenditure quantile					
	Bottom quintile	Second	Third	Fourth	Top quintile	N
Philippines	1599	2022	2280	2591	3556	18,290
	(34)	(36)	(39)	(50)	(84)	
Children 1-6 yr.	1808	2613	3152	3845	5915	2,295
	(120)	(147)	(156)	(195)	(391)	
Children 7-12 yr.	1668	2115	2428	2690	3858	2,684
	(63)	(71)	(96)	(91)	(208)	
Teen 13-19 yr.	1616	1947	2099	2318	3455	2,884
	(57)	(61)	(72)	(74)	(184)	
Adult 20-59 yr.	1421	1806	1929	2137	2727	7,802
	(29)	(45)	(34)	(42)	(68)	
Elderly 60+ yr.	1543	1801	2260	2368	3109	1,920
	(54)	(46)	(89)	(106)	(118)	
Pregnant & Lactating Adult	1353	1886	1908	2290	2336	532
	(54)	(124)	(143)	(138)	(110)	

Note: Food expenditures are calculated by multiplying food consumption information from NNS 2013 (household per AME food consumption and individual food consumption are obtained from household diet and individual diet module separately) with unit price information derived from FIES 2015. Expenditures are in 2015 Philippine pesos. Standard errors are shown in parentheses.

Considering Table 2, we find that average individual monthly food expenditure increases with the level of household per AME expenditures, as gauged by household food expenditure quintiles. This is as we would expect. Generally, expenditure also increases, based on individual age: typically, adults have greater food expenditure, relative to children. Notable exceptions to this trend are that teenagers (between 13 and 19 years old) tend to have greater expenditure than adults

(between 20 and 59 years old). Further, children between the ages of one and six tend to have greater individual food expenditure relative to other groups, largely due to expenditures on milk.

Figure 3: Average individual monthly food expenditure (in Philippine pesos), by household per AME food expenditure quantile



Note: Food expenditures are calculated by multiplying food consumption information from NNS 2013 (household per AME food consumption and individual food consumption are obtained from household diet and individual diet module separately) with unit price information derived from FIES 2015. Figure based on numbers reported in Table 2.

There are interesting differences between household food expenditure quintiles, evident in Figure 3. The smallest changes are in moving between the middle quintiles: from the second to the third, and the third to fourth. The greatest differences between these quintiles are for children between one and six (just over 20 percent) and the smallest are for teens (10 percent or less). Pregnant and lactating women are outliers, however, and do not adhere to the trends in other age categories. In this case, the smallest differences are in moving between the second and third expenditure quintile and between the fourth and top expenditure quintile. These small changes suggest that less is allocated to the individual groups, as household expenses rise. There are larger changes in the other quintiles: between the fourth and top expenditure quintiles (more than a 50 percent change in expenses for children between the ages of one and six; approximately 40 percent, on average, across age groups) and between the lowest to second household food expenditure quintile (a 45 percent change for children between the ages of one and six; though approximately 25 percent, on average, across age groups).

Table 3: Proportion of sample with above and below median food expenditure, by individual or household-level measure

	Above median household per AME food expenditure	**Below median household per AME food expenditure**	**Overall**
Above median individual food expenditure	35.24 (0.40)	28.20 (0.36)	63.45
Below median individual food expenditure	18.25 (0.31)	18.30 (0.32)	36.55
Overall	53.49	46.51	100.00

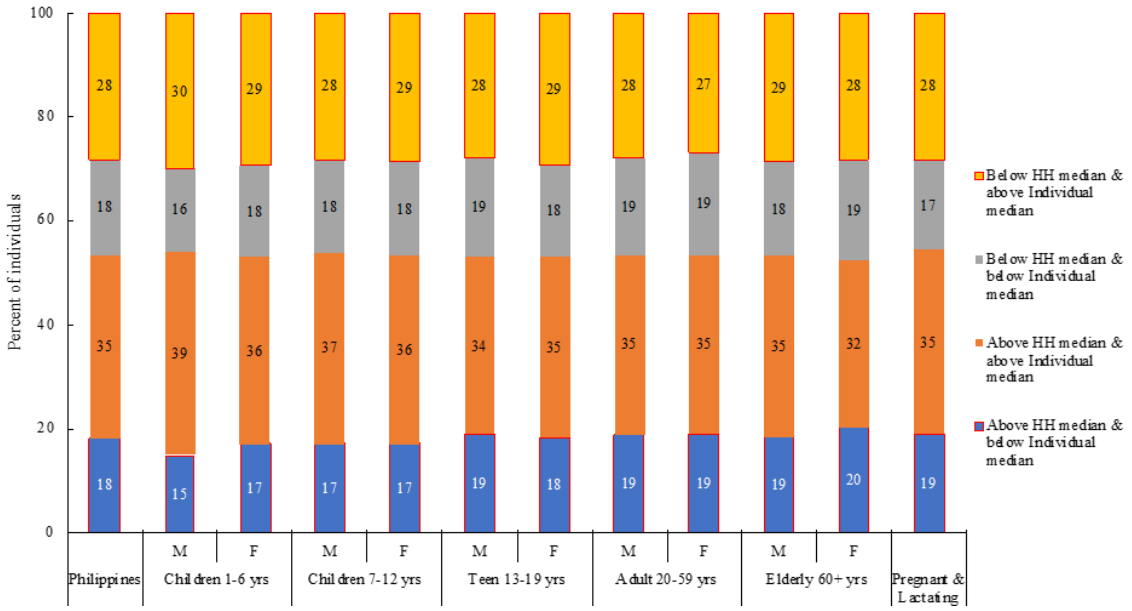
Note: Standard errors are presented in parentheses.

Next, we consider Table 3, which is a simplified version of Table 2, in which we simply consider if a household is above or below the median individual food expenditure, and whether or not they belong to a household with above or below median household per AME food expenditure. Across all age and gender categories, about 35.24 percent of individuals consume above the median individual food expenditure and reside in households which are above the household median food expenditure. While 18.30 percent of individuals consume below the median individual food expenditure and reside in households which are below the median household food expenditure. This means, however, that just under half of individuals and households do not align: 18.25 percent of individuals consume below the median individual food expenditure, but reside in households which consume above the median household food expenditure; and 28.20 percent of individuals consume above the median individual food expenditure, but reside in households which consume below the median household food expenditure. These findings suggest that although many individuals are identified the same way as their households, many individuals are identified differently than their household.

Figure 4 presents a deeper analysis of these trends by showing individuals below and above the individual food expenditure median, within households above and below the household expenditure median, by gender and age groups. Findings are broadly similar across age groups and reflect the same insights from Table 2, that most individuals are similarly identified as being above

the median in households above the median or below the median in households below the median (orange and grey in Figure 4, respectively). Just under 30 percent of individuals are above the individual median in households that are below the household median (yellow in Figure 4), across all age categories. Individuals below the median in households above the median (blue in Figure 4) represent about 20 percent of individuals. Overall, this supports the findings in Tables 2 and 3 and suggests that there are individuals who do not align with their household.

Figure 4. Median food consumption for households and individuals, by individual categories



Note: Household median and individual median are specific for each individual category. For example, the household median for male children 1-6 years is the median household per AME food expenditure among all male children between one and six years of old. Similarly, individual median means the median individual food expenditure for that group.

There are potential implications for the long-term health of the population and human capital formation. This may occur if people who consume less on average than their households are omitted from programs which could assist them, because they appear to be adequately resourced, at the household-level.

5. Do people with poor diets live in households with poor diets?

We next examine the disparities in individual- and household-level consumption. We investigate the same question as the previous section, but this time instead of food expenditure, we examine diet quality.[4] Broadly, we find evidence of some inequalities in household consumption, but overwhelming evidence that, with respect to diet, most household members are not meeting recommended levels of consumption across food categories.

Figure 5. Percent gap in consumption against FBDG, household and individuals

	Starchy Staples	Vegetables	Fruits	Eggs	Meat, fish & pulses	Milk & milk products
Household Per AME	39	−54	−80	−61	85	−74
Male						
Children 1–6 yrs	−1	−57	−86	−60	43	−13
Children 7–12 yrs	12	−10	−70		57	−83
Teen 13–19 yrs	11	−79	−90	−73	60	−91
Adult 20–59 yrs	25	−71	−87	−73	71	−92
Elderly 60+ yrs	21	−73	−75	−83	33	−83
Female						
Children 1–6 yrs	−11	−55	−87	−57	39	−27
Children 7–12 yrs	−1	−11	−72		38	−84
Teen 13–19 yrs	−17	−83	−89	−74	38	−82
Adult 20–59 yrs	−15	−76	−82	−77	29	−86
Elderly 60+ yrs	−13	−76	−79	−84	−6	−75
Pregnant	10	−80	−55	−76	−23	−77
Lactating	4	−81	−86	−76	−26	−89

Figure 5 presents the percent gap in consumption against FBDG for individuals, disaggregated by gender and age, with a household per AME reference. In the figure, the green indicates cases in which individuals meet the requirements, while the red indicates cases in which individuals do not meet the requirements. It is immediately clear that no one meets the recommended requirements for vegetables, fruits, eggs, or milk and milk products. Most male individuals meet the requirements for starchy staples and for meat, fish, and pulses. Female individuals meet fewer requirements. Only pregnant and lactating mothers meet the recommended requirements for starchy staples. On the contrary, pregnant and lactating mothers, as well as elderly women (older than 60 years), do not meet the recommend consumption requirements for meat, fish, and pulses,

[4] We also looked at the disparities in individual- and household-level nutrient intake. A similar heat map to Figure 4 is shown in Annex 1.

while all other female individuals meet the requirements in this category. This suggests our findings are generally in line with well documented trends, which see bias against women in intra-household resource allocation (Brown et al., 2021; D'Souza and Tandon, 2019).

Table 4. Proportion of individuals not meeting dietary guidelines, by household per AME food expenditure quintiles

	Philippines	Bottom quintile	Second	Third	Fourth	Top quintile
Starchy Staples	56.97	61.56	57.28	56.20	53.67	55.96
	(0.41)	(0.86)	(0.84)	(0.93)	(0.95)	(0.96)
Vegetables	91.98	89.12	91.16	93.25	92.99	93.57
	(0.21)	(0.51)	(0.46)	(0.42)	(0.45)	(0.46)
Fruits	95.77	96.29	96.96	95.84	95.81	93.93
	(0.16)	(0.31)	(0.27)	(0.34)	(0.38)	(0.44)
Eggs	93.41	95.90	94.69	92.28	93.27	91.07
	(0.22)	(0.36)	(0.40)	(0.53)	(0.49)	(0.64)
Meat, fish & pulses	42.41	61.05	45.21	41.34	37.37	27.42
	(0.41)	(0.88)	(0.85)	(0.93)	(0.91)	(0.85)
Milk & milk products	93.26	97.86	95.45	93.84	92.24	86.93
	(0.23)	(0.28)	(0.41)	(0.52)	(0.54)	(0.69)
N	18,290	3,872	3,980	3,694	3,453	3,291

Note: Each individual's food consumption is compared against their age-specific dietary guideline. Standard errors are shown in parenthesis.

We next want to understand if individuals who do not meet these nutritional recommendations are in lower quintiles of household food expenditure. This is presented in Table 4. First examining vegetables, fruits, eggs, and milk and milk products, it is clear that most individuals, regardless of expenditure quintile do not meet these recommended requirements for consumption. While a larger, though small percent of individuals in the upper quintiles of households may meet the

requirements, relative to lower quintile households, in all cases, more than 90 percent of individuals do not meet the recommended requirements. This is in line with the findings presented in Figure 5.

Examining starchy staples and meat, fish, and pulses, we see notable differences across income quintiles. For starchy staples, more than 60 percent of individuals in the lowest expenditure quintile do not meet the requirements; the falls to below 60 percent in all other income categories. This is still a large number of individuals failing to meet these requirements, however. Considering meat, fish, and pulses, there are large discrepancies across income quintiles. In the bottom quintile, again, more than 60 percent of individuals do not meet the requirements. This falls to 45 and 41 percent in the second and third income quintiles, and then as low as 37 and 27 percent in the fourth and top income quintiles. This suggests important differences across income categories, in particular for meat, fish, and pulses, though also for starchy staples.

To investigate these findings further, we disaggregate the requirements in various categories, but also identify individuals as having requirements as met or unmet, by individual consumption and household average consumption. This is presented in Table 5. We consider all individuals on average, male individuals, female individuals, and various age categories. We also consider separately pregnant and lactating mothers.

Notably in Table 5, considering all individuals, we see that the recommended requirements are unmet for vegetables (84 percent), fruit (90 percent), eggs (82 percent), and milk and milk products (88 percent). There are some small differences across these categories, disaggregating by gender or age. Consider vegetables, while 84 percent of individuals do not meet these requirements, this falls to 66 percent for children between the ages of seven and 12. Further, children of this age who meet the requirements (25 percent) are located in households in which the requirements were unmet. Similarly, for milk and milk products, although 88 percent of individuals do not meet these requirements, this falls to 72 percent for children under the age of six.

Examining starchy staples and meat, fish, and pulses, there are more differences across groups. For starchy staples, 38 percent of individuals who do not meet the requirements are in households that did meet the requirements. More women than men do not meet the requirements, in particular pregnant and lactating women. Further, more children under the age of six than in other age

categories do not meet the recommended requirements. In this case, consumption biases tend to penalize women and children, relative to adults and men.

We observe similar trends for meat, fish, and pulses. In this case, 22 percent of individuals who do not meet the requirements are living in households in which the requirements are met. Again, more women than men have unmet requirements, with pregnant and lactating women in particular not meeting the recommended requirements. Forty-four percent of pregnant women and 37 percent of lactating women have individual needs which are unmet, but live in households in which the requirements are met. Again, more children under the age of six do not meet the requirements, relative to other age categories.

Based on these findings, we broadly conclude there is no intra-household inequality in cases in which most household members do not meet the recommended requirements for consumption. This is the case for most products, including vegetables, fruit, eggs, and milk and milk products. Importantly, though, there are some biases, as might be expected, based on trends in the existing literature (Brown et al., 2021; D'Souza and Tandon, 2019).

6. Discussion and conclusion

We evaluate the discrepancy between household and individual measurement of food expenditure and diet quality in the Philippines. To better understand intra-household food expenditure and diet quality in the Philippines, we estimate individual- and household-level distribution and quality of consumption and compare consumption for individuals within a household to that of the household overall.

We find that about 35.24 percent of individuals consume above the median individual food expenditure and reside in households which are above the household median food expenditure. Similarly, just under 18.30 percent of individuals consume below the median individual food expenditure and reside in households which are below the median household food expenditure. This means, however, that just under half of individuals and households do not align: 18.25 percent of individuals consume below the median individual food expenditure, but reside in households which consume above the median household food expenditure; and 28.20 percent of individuals

consume above the median individual food expenditure, but reside in households which consume below the median household food expenditure rate. These findings suggest that although many individuals are identified the same way as their households, many individuals are identified differently than their household.

Further, considering consumption and diet quality, we conclude that in many households, most people are not consuming the recommended amounts of food, specifically for vegetables, fruit, eggs, and milk and milk products. However, in cases where there are intra-household inequalities, biases exist. Men are the most likely to meet the recommended consumption requirements, while women and children are the least likely to meet the same requirements. This is present for the consumption of staple crops, as well as meat, fish, and legumes.

From this work, we draw several policy conclusions related to welfare and the targeting of welfare and nutrition programs. Intra-household inequality may result in experienced welfare for individuals disparate from standard measurements. Our findings quantifying the extent of these differences and that those who are most likely to be affected by these disparities (women and children) are often the most vulnerable in the household. Our findings bolster support for individual-based measurement that can better ensure that the target individuals for welfare and nutrition programs are reached.

Table 5. Meeting Dietary Guidelines – Household and Individual

Food	*Classification*	*All*	*Male*	*Female*	*Children 1-6*	*Children 7-12*	*Teens 13-19*	*Adult 20-59*	*Elderly 60+*	*Pregnant & Lactating*
Starchy staples	Unmet	0.19	0.14	0.24	0.18	0.16	0.20	0.18	0.31	0.14
	HH unmet, Indiv met	0.11	0.14	0.09	0.10	0.12	0.10	0.11	0.21	0.07
	HH met, Indiv unmet	0.38	0.30	0.46	0.44	0.39	0.41	0.35	0.27	0.39
	Met	0.32	0.42	0.22	0.28	0.34	0.29	0.36	0.21	0.40
Vegetables	Unmet	0.84	0.83	0.84	0.81	0.66	0.89	0.87	0.89	0.87
	HH unmet, Indiv met	0.06	0.07	0.06	0.10	0.25	0.01	0.02	0.02	0.01
	HH met, Indiv unmet	0.08	0.08	0.08	0.06	0.04	0.09	0.10	0.09	0.12
	Met	0.02	0.02	0.01	0.03	0.05	0.01	0.01	0.00	0.00
Fruit	Unmet	0.90	0.91	0.90	0.92	0.87	0.92	0.90	0.89	0.90
	HH unmet, Indiv met	0.04	0.03	0.04	0.03	0.08	0.02	0.03	0.05	0.04
	HH met, Indiv unmet	0.05	0.06	0.05	0.05	0.04	0.06	0.06	0.05	0.05
	Met	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01
Eggs	Unmet	0.82	0.81	0.82	0.75	0.86	0.82	0.81	0.88	0.83
	HH unmet, Indiv met	0.05	0.05	0.05	0.12	0.00	0.06	0.05	0.02	0.04
	HH met, Indiv unmet	0.12	0.11	0.12	0.10	0.14	0.12	0.12	0.08	0.11
	Met	0.02	0.02	0.01	0.04	0.00	0.01	0.02	0.01	0.02
Meat, fish, pulses	Unmet	0.20	0.18	0.22	0.21	0.23	0.18	0.15	0.31	0.35
	HH unmet, Indiv met	0.16	0.17	0.15	0.17	0.17	0.18	0.15	0.22	0.05
	HH met, Indiv unmet	0.22	0.19	0.26	0.26	0.21	0.18	0.20	0.23	0.39
	Met	0.42	0.46	0.37	0.35	0.39	0.45	0.50	0.23	0.20
Milk, milk products	Unmet	0.88	0.88	0.87	0.72	0.91	0.92	0.90	0.91	0.89
	HH unmet, Indiv met	0.05	0.05	0.05	0.17	0.04	0.03	0.02	0.06	0.04
	HH met, Indiv unmet	0.06	0.05	0.06	0.04	0.05	0.04	0.07	0.03	0.06
	Met	0.02	0.02	0.02	0.07	0.01	0.01	0.01	0.00	0.01
	Observations	18,290	9,060	9,230	2,295	2,684	2,884	7,802	1,920	532

References

Ainsworth, M. and D. Filmer (2006). Inequalities in children's schooling: AIDS, orphanhood, poverty, and gender. *World Development* 34 (6): 1099 – 1128.

Bicego, G., S. Rutstein, and K. Johnson (2003). Dimensions of the emerging orphan crisis in Sub-Saharan Africa. *Social Science and Medicine* 56 (60: 1235 – 1247.

Brown, C., M. Ravallion, D. van de Walle (2017). Are poor individuals mainly found in poor households? Evidence using nutrition data for Africa. Policy Research Working Paper: Development Research Group – Human Development and Public Services Team #8001.

Brown, C., R. Calvi, J. Penglase (2021). Sharing the pie: An analysis of undernutrition and individual consumption in Bangladesh. *Journal of Political Economy* 200: 104460.

Calvi, R. (2020). Why are older women missing in India? The age profile of bargaining power and poverty. *Journal of Political Economy* 128 (7): 2453-2501.

Chen, M. and J. Drèze (1992). Widows and health in rural North India. *Economic and Political Weekly* WS81 – WS92.

Coates, J.C., B.A. Colaiezzi, W. Bell, U.R. Charrondire, and C. Leclercq (2017). Overcoming dietary assessment challenges in low-income countries: Technological solutions proposed by the International Dietary Data Expansion (INDDEX) Project. *Nutrients* 9 (3): 289 doi:10.3390/nu9030289.

Coates, J., B.N. Patenaude, B.L. Rogers, A.C. Roba, Y.K. Woldetensay, A.F. Tilahun, and K.L. Speilman (2018). Intra-household nutrient inequality in rural Ethiopia. *Food Policy* 81: 82-94.

Cormick, G., A.P. Betran, I.B. Romero, C.F. Lombardo, A.M. Gülmezoglu, A. Ciapponi, J.M. Blizan (2019). Global inequlaities in dietary calcium intake during pregnancy: a systematic review and meta-analysis. *BJOG* 124: 444 – 456.

Dang, A.H., D.M. Jolliffe, and C. Carletto (2019). Alternative methods to produce poverty estimates: When household consumption data are not available (Part II). Data Blog, World Bank. https://blogs.worldbank.org/opendata/alternative-methods-produce-poverty-estimates-when-household-consumption-data-are-not-available-0. Accessed 23 December 2021.

Deaton, A., J. Muellbauer (1980). An almost ideal demand system. *American Economic Review* 70; 312-326.

Deaton, A. (1987). Estimation of Own- and Cross-Price Elasticities from Household Survey Data. *Journal of Econometrics* 36: 7-30.

De Vreyer, P., and S. Lambert. (2021). Inequality, poverty, and the intra-household allocation of consumption in Senegal. The World Bank Economic Review 35 (2): 414-435.

Dizon, F., Herforth, A., & Wang, Z. (2019). The cost of a nutritious diet in Afghanistan, Bangladesh, Pakistan, and Sri Lanka. Global Food Security, 21, 38-51.

Drèze, J. and P. Srinivasan (1997). Widowhood and poverty in rural India: Some inferences from household survey data. *Journal of Development Economics* 54: 217 – 234.

D'Souza, A., S. Tandon (2020). Intrahousehold nutritional inequities in rural Bangladesh. *Economic Development and Cultural Change* 67 (3): 625-657.

Dunbar, G.R., A. Lewbel, and K. Pendakar (2013). Children's resources in collective households: Identification, estimation, and an application to child poverty in Malawi. *American Economic Review* 103: 438-471.

Evans, D. and E. Miguel (2007). Orphans and schooling in Africa: A longitudinal analysis. *Demography* 44: 35 – 57.

Food and Nutrition Research Institute (FNRI). (n.d.) Republic of the Philippines: Department of Science and Technology. Food and Nutrition Research Institute. https://www.fnri.dost.gov.ph/. Accessed 21 December 2021.

Harris-Fry, H., P. Paudel, N. Shrestha, T. Harrison, B.J. Beard, S. Jha, B.P. Shrestha, D.S. Manandhar, A.M.D.L Costello, M. Cortina-Borja, N.M. Saville (2018). Status and determinants of intra-household food allocation in rural Nepal. *European Journal of Clinical Nutrition* 72: 1524-1536.

Integrated Food Security Phase Classification (IPC) (n.d.). Philippines: Chronic Food Insecurity Situaiton 2015 – 2020. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1044577/?iso3=PHL. Accessed 30 December 2021.

Jayachandran, S. and I. Kuziemko (2011). Why do mothers breastfeed girls less than boys? Evidence and implications for child health in India. *Quarterly Journal of Economics* 126: 1485 – 1538.

Josephson, A., (2022). The management of joint household resources: Evidence from Malawi. Working Paper. http://arxiv.org/abs/2112.12766.

Lancaster, G., P. Maitra, and R. Ray (2008). Household expenditure patterns and gender bias: Evidence from selected Indian states. *Oxford Development Studies* 36: 133 – 157.

Mbuya, N.V.N., G. Demombynes, S.F.A. Piza, and A.J.V. Adona. (2021). Undernutrition in the Philippines: Scale, Scope, and Opportunities for Nutrition Policy and Programming. International Development in Focus. World Bank Group. https://openknowledge.worldbank.org/bitstream/handle/10986/35530/9781464817014.pdf. Accessed 20 December 2021.

Oster, E. (2009). Does increased access increase equality? Gender and child health investments in India. *Journal of Development Economics* 89: 62-76.

Patalen, C.F., N. Ikeda, I. Angeles-Agdeppa, M.B. Vargas, N. Nishi, C.A. Duante, M.V. Capanzana. (2020). Data Resource Profile: The Philippine National Nutrition Survey (NNS). *International Journal of Epidemiology* 49 (3): 742 – 743f.

Philippine Statistical Authority (PSA). (2020). Family Income and Expenditure Survey (FIES). https://psa.gov.ph/tags/2015-fies. Accessed 21 December 2021.

Piccoli, L. (2017). Female poverty and intrahousehold inequality in transition economies. IZA World of Labor: 353 doi: 10.15185/izawol.353

SOFI: FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en

Udry, C. (1996). Gender, agricultural production, and the theory of the household. *Journal of Political Economy* 104 (5): 1010-1046.

van de Walle, D. (2013). Lasting welfare effects of widowhood in Mali. *World Development* 51: 1-19.

Weisell, R., & Dop, M. C. (2012). The Adult Male Equivalent Concept and its Application to Household Consumption and Expenditures Surveys (HCES). *Food and Nutrition Bulletin*, *33*(3_suppl2), S157-S162. https://doi.org/10.1177/15648265120333s203

World Bank (2015). A measured approach to ending poverty and boosting shared prosperity: Concepts, data, and the twin goals. Washington, D.C.: World Bank.

World Bank (2018). Making growth work for the poor: a poverty assessment for the Philippines. Washington, D.C.: World Bank Group.

World Bank (2021). Philippines at a Glance. https://www.worldbank.org/en/country/philippines/overview#1. Accessed 19 November 2021.

World Bank (2022). World Bank, World Development Indicators. https://databank.worldbank.org/source/world-development-indicators#. Accessed 3 March 2022.

Annex 1. Nutrient Intake Gap, by Age and Sex

Annex Table 1 presents the gap in nutrient intake for infants, children, and adults. As with the food groups presented in the main text of the paper, there are clear disparities among the nutrient intake groups, though many individuals in these households are falling short of recommendations. The table shows that individuals in households do not meet the recommendations for energy and calcium, and, for the most part, for iron and vitamin C. Younger children are somewhat more likely to meet the recommendations for protein (in particular among males), vitamin A, riboflavin, and thiamin.

	Energy	Protein	Iron	Calcium	Vitamin A	Vitamin C	Niacin	Riboflavin	Thiamin
Household Per AME	–11	21	11	–20	28	–11	86	–16	2
Male									
Infants 0-5 Mo									
Infants 6-11 Mo	–10	44	–5		140		51	210	109
Children 1-2 Yrs	–20	75	–5	13	140	116	26	110	46
Children 3-5 Yrs	–24	76	–21	–26	68	25	79	28	20
Children 6-9 Yrs	–18	67	–20	–38	23	–4	72	–3	11
Children 10-12 Yrs	–25	37	–22	–34	–6	–26	64	–23	7
Children 13-15 Yrs	–32	12	–51	–25	–14	–42	49	–37	–12
Children 16-18 Yrs	–34	4	–23	–24	–8	–54	43	–37	–11
Adults 19-29 Yrs	–17	16	–2	–41	43	–51	81	–22	0
Adults 30-49 Yrs	–16	17	–5	–37	6	–43	83	–29	–8
Adults 50-59 Yrs	–23	7	–12	–41	9	–35	71	–32	–18
Adults 60-69 Yrs	–24	–4	–21	–41	–35	–39	52	–42	–26
Adults >=70 Yrs	–27	–14	–29	–42	–33	–42	36	–42	–32
Female									
Infants 0-5 Mo									
Infants 6-11 Mo	–32	7	–35		87		9	109	21
Children 1-2 Yrs	–22	68	–31	–6	104	107	21	77	12
Children 3-5 Yrs	–25	73	–25	–30	78	11	63	56	39
Children 6-9 Yrs	–21	48	–18	–42	30	–9	52	7	21
Children 10-12 Yrs	–29	12	–55	–36	1	–31	32	–27	–14
Children 13-15 Yrs	–29	4	–51	–33	2	–43	49	–21	–4
Children 16-18 Yrs	–34	–3	–52	–53	5	–46	39	–28	–14
Adults 19-29 Yrs	–18	7	–68	–48	20	–42	51	–19	–6
Adults 30-49 Yrs	–22	–3	–71	–51	–2	–40	42	–31	–22
Adults 50-59 Yrs	–27	–9	–16	–52	–8	–34	34	–35	–30
Adults 60-69 Yrs	–21	–14	–20	–50	–31	–36	27	–37	–13
Adults >=70 Yrs	–29	–27	–31		–36	–45	8	–44	–43
Pregnant	–28	–27	–72				15	–48	–30
Lactating	–32	–29	–71				23	–49	–31

Annex 2. Demographics by Sample

	Full Sample	*Individual Dietary Sample*
Age	29.85	29.67
Male	0.51	0.50
Region		
ILOCOS REGION	0.07	0.07
CAGAYAN VALLEY	0.05	0.05
CENTRAL LUZON	0.09	0.09
BICOL	0.07	0.06
WESTERN VISAYAS	0.07	0.07
CENTRAL VISAYAS	0.07	0.08
EASTERN VISAYAS	0.06	0.06
ZAMBOANGA PENINSULA	0.04	0.05
NORTHERN MINDANAO	0.05	0.06
DAVAO REGION	0.05	0.06
SOCCSKSARGEN	0.05	0.06
NATIONAL CAPITAL REGION	0.10	0.10
CORDILLERA ADMINISTRATIVE	0.05	0.04
ARMM	0.04	0.04
CARAGA	0.05	0.05
CALABARZON	0.08	0.08
Wealth quintile		
Poorest	0.23	0.25
Poor	0.22	0.19
Middle	0.20	0.20
Rich	0.18	0.18
Richest	0.17	0.17
N	160,608	18,446

Note: Source - NNS 2013

Annex 3. Share of household total food expenditure by food groups

	% of total household expenditure
Starchy Staples	30.04
Vegetables	9.89
Fruits	2.67
Eggs	3.42
Meat, fish & pulses	40.44
Milk & milk products	6.09
Fats & oils	2.68
Sugar & sweets	1.16
Condiments, spices, and beverages	3.61
N	40922

Note: Source - NNS 2013; FIES 2015