



MYANMAR

STRATEGY SUPPORT PROGRAM RESEARCH NOTE 108

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Prevalence of Underweight, Overweight and Obesity Among Mothers in Yangon and Ayeyarwady, October–November 2023



Summary

The COVID-19 pandemic in 2020 and the military takeover in early 2021 has made collection of anthropometric data extremely difficult in Myanmar. To redress this evidence gap, we implemented an in-person Rural-Urban Food Security Survey (RUFSS) of caregivers and their young children in urban and peri-urban Yangon and rural Ayeyarwady in October and November 2023, collecting data on maternal anthropometric outcomes (height and weight) for 642 mothers, as well as many other individual and household socioeconomic characteristics. Here we report results for maternal body mass index (BMI): underweight (BMI<18.5) and overweight (BMI 25.0-29.9) and obesity (BMI≥30) using global cut-offs.

We find that 7 percent of mothers were underweight, while 42 percent were overweight/obese, including 30 percent overweight and 12 percent obese. Overweight/obesity rates are higher for wealthier households (54 percent) but are still high in absolute terms among the poorest (32 percent). When comparing to the 2015–16 DHS Yangon sub-sample, overweight and obesity prevalence in the 2023 RUFSS is 2 percentage points higher than the DHS. Given that the RUFSS sample is relatively poor, and that obesity rises with wealth, we can infer that the true prevalence of obesity among mothers of young children in Yangon is higher than the 11 percent estimate from RUFSS, and therefore that obesity is rising since 2015–16.

We then explore potential explanations. RUFSS data indicates that maternal diets are characterized by infrequent consumption of nutrient-dense foods and frequent consumption of unhealthy foods. Surprisingly, though, obese women are less likely to report consumption of unhealthy food in the past 24 hours, though without data on consumption quantities it is difficult to infer calorie intake. Looking at meso- and macro-data, palm oil and sugar consumption has risen dramatically in the past two decades: in 2019/20, palm oil consumption was almost 6 times higher than it was a decade earlier, while sugar consumption was double. Since 2021, sugar consumption has fallen sizably while palm oil consumption has only fallen modestly. Price data show that palm oil is easily the cheapest source of calories, followed by rice and sugar, while processed unhealthy foods are calorically much cheaper than unprocessed healthy foods (except pulses). Once preparation times and cooking fuel costs are factored in, unhealthy foods become even more economically unattractive for poor or time-constrained women.

In policy and programmatic terms, rising obesity in Myanmar is a serious public health concern, since obesity is a major risk factor for a wide range of non-communicable diseases (heart disease and diabetes in particular) that increase mortality and morbidity risks and impose large costs on the health system and the economy at large. Poor diets in Myanmar require “double duty” interventions that address undernutrition as well as “overnutrition”: social behavioral communications change (SBCC) to improve nutritional knowledge and dietary practices, nutrition-sensitive social protection, taxation and tariffs, regulation of unhealthy foods (e.g. food labelling, preventing unhealthy food consumption in schools), and agricultural policies to improve productivity and year-round consumer access to healthy foods.

Introduction

In this research note, we report results on the prevalence of underweight, overweight and obesity among mothers of young children using data collected in Yangon and Ayeyarwady as part of the Rural-Urban Food Security Survey (RUFSS). This in-person study, conducted between October–November 2023, surveyed mothers who were registered from antenatal clinics in peri-urban Yangon in early 2020. In this latest survey round, we revisited this sample of mother-child pairs to gather anthropometric data (along with other nutrition-relevant indicators). We successfully collected anthropometric data for 646 mothers.

The motivations for exploring maternal body mass are twofold. First, maternal malnutrition can be a risk factor for undernutrition in children, either through prenatal mechanisms (undernutrition in utero) or postnatal mechanisms (e.g. quality of caregiving), giving maternal nutrition an instrumental value. Second, poor maternal nutrition obviously matters in its own right, and increasingly it is overweight/obesity that constitutes the more important risk in terms of the burden of disease in Myanmar and other developing countries (Afshin, et al., 2019).

Since COVID-19 and the military takeover in February 2021, maternal nutrition in Myanmar has almost certainly deteriorated significantly as poverty and food insecurity have risen sharply. At the national level these concerning trends have been amply documented by IFPRI's Myanmar Household Welfare Survey (MHWS) and associated food vendor surveys (MAPSA, 2024a, 2024b). Nationally, the increase in the percentage of the population living in income-poor households increased from 62 percent in February–June 2023 to 72 in August–November 2023 (MAPSA, 2024a), while the prevalence of inadequate diet diversity among adults rose from 20.6 percent to 30.9 percent over December 2021–February 2022 to October–December 2022, although the increase was larger for women (12.1 percentage points) compared to men (8.4 percentage points), and driven by lower consumption of dairy, vitamin A rich fruits, meat, fish, and eggs (MAPSA, 2024b).

Although MHWS phone surveys have been able to track trends in both the immediate and underlying determinants of malnutrition, the challenges of reaching vulnerable Myanmar households in person has precluded assessment of anthropometric outcomes. However, in October and November 2023, IFPRI and its research partners were able to conduct collect anthropometric data from children and their mothers in urban and peri-urban Yangon and rural Ayeyarwady. While the survey is not strictly representative even of Yangon, it does cover vulnerable and relatively poor populations, mostly in peri-urban Yangon and a smaller sample of rural Ayeyarwady; both geographies have high rates of food insecurity.

Data collection

The data used in this research note come from an in-person survey, conducted between October – November 2023, sampling 702 households that were previously part of a series of 10 rounds of high-frequency telephone surveys conducted between June 2020 and December 2021 (Headey et al. 2022). That initial sample consisted of pregnant mothers who were registered in antenatal clinics in peri-urban Yangon in early 2020. As a result, most mothers have children who were born in 2020. A second implication of this recruitment strategy is that we may be oversampling poorer households, since most of these clinics were located in peri-urban areas that are generally poorer than more urbanized areas of metropolitan Yangon. The total number of mothers we report anthropometric outcomes for is 646, since some mothers were not present (e.g. had migrated) at the time of the survey, and since several were either pregnant or had given birth in the preceding 2 months were excluded.

In addition to the anthropometry modules, in the survey we also collected data on whether or not a mother consumed various healthy and unhealthy food groups in the past 24 hours via the Dietary Quality Questionnaire (DQQ), which includes an expanded 29 food groups (Herforth, et al.). The DQQ enables us to capture not just the standard dietary diversity indicators as recommended by WHO, but also indicators on consumption of unhealthy and junk food.

We also collect data to estimate poverty levels, food security, illnesses, shocks, coping strategies, and other indicators of welfare. Our main indicator of socioeconomic status is based on an asset count index, which is a simple summation of the number of assets owned by the household from a list of ten assets.¹ From the sum of assets at each household, the household is categorized into asset classes which are defined as “Asset poor” for ownership of 0–3 items, “Asset low” for ownership of 4–6 items, and “Asset rich” for ownership of 7–10 items. Further details on the survey design and implementation are given in a MAPSA policy note (MAPSA, 2024c).

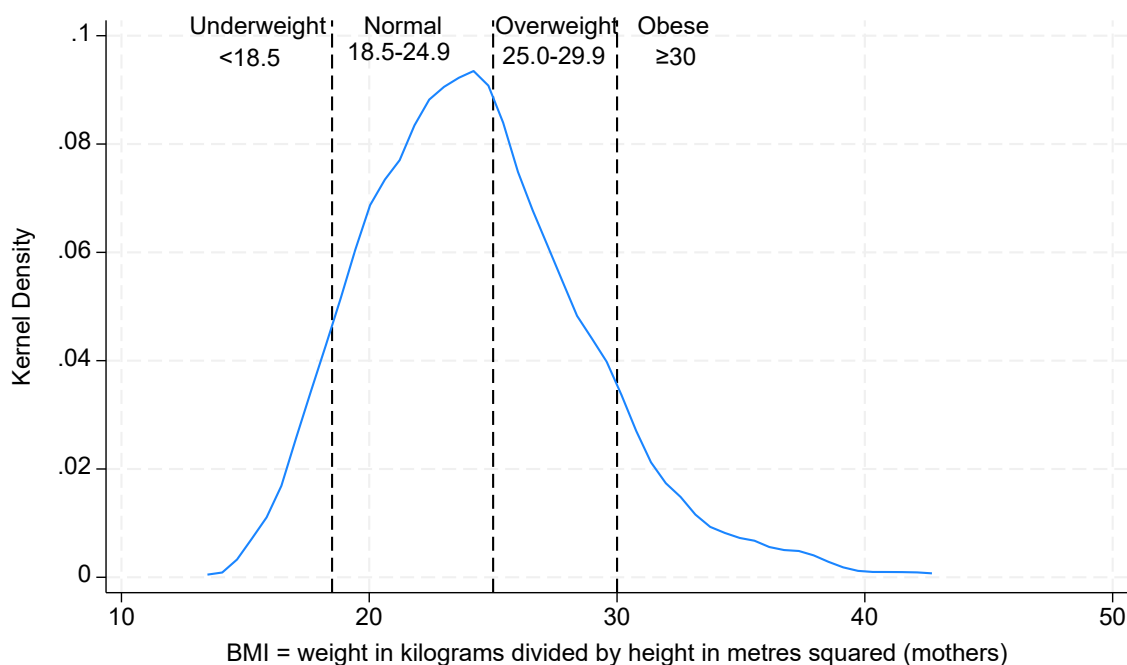
Food insecurity is measured from the Food Insecurity Experience Scale (FIES) (Cafiero, Viviani, & Nord, 2018), which asks eight questions scaled by the order of severity of experience. We classify a household as mildly insecurity if they answered yes to questions 1–3, moderately insecure if they answered yes to questions 4–6 and severely insecure if they answered yes to questions 7 and 8 on going to bed hungry or going a whole day without eating, with each respondent's classification determined by the most severe experience they report.

¹ Namely – whether the household has piped water into the dwelling, a flush (improved) toilet, electricity from the national grid/private company/generator, a television, a fridge, a mechanized mode of transportation (car/motorcycle/boat), an electric rice cooker, a wardrobe, a working computer or tablet, and at least one-quarter room per person in household.

Key results on body mass indicators of mothers

Information on BMI is presented in Table 1, while the distribution of BMI scores is presented in Figure 1. BMI is calculated by dividing weight in kilograms by height in meters squared (kg/m^2). A BMI of less than 18.5 indicates that respondents are too thin for their height or relatively underweight – hereafter “underweight” (likely indicating a chronic energy deficiency). At the other end of the BMI scale, we have used the BMI cutoffs for global population as recommended by the WHO, where women are considered overweight if their BMI falls between 25.0 and 29.9 and obese if their BMI is greater than or equal to 30 (WHO).²

Figure 1. Kernel density plot for maternal BMI



Source: RUFSS follow-up survey, October–November 2023. Note: Excludes pregnant women and women with a birth in the preceding 2 months. N=663

As can be seen from Figure 1, mothers in this sample are characterized by a “double burden” problem, with some mothers still underweight, but many more mothers overweight or obese. Table 1 shows that 7 percent of mothers are underweight (BMI below 18.5), while 53 percent have a normal BMI (between 18.5 and 24.9). However, an alarmingly high proportion (40 percent) of mothers are overweight or obese (BMI>30), comprised of 29.9 percent overweight and 10.1 percent obese.

More women are overweight or obese in the much larger Yangon sample (41 percent overweight/obese vs 23 percent in the small Ayeyarwady sample). Overweight/obesity rises modestly with education levels but rises much more sharply with asset levels: 32 percent of asset-poor mothers are overweight/obese compared to 45 percent among asset-low and 54 percent among asset-rich mothers. Obesity rates for the asset-rich (14 percent) are almost double those of the asset-poor (8 percent), but obesity for asset-low households is surprisingly high (11 percent). Conversely, underweight prevalence is much higher for the asset-poor (10 percent) than asset-low (5 percent) or asset-rich (2 percent). Patterns by main household livelihoods vary. Trade, salary, and a small category of “other livelihoods” have the highest overweight/obesity and the lowest underweight

² WHO. Malnutrition in women. Global Health Observatory (GHO) data repository. Body mass index (BMI) <https://www.who.int/data/nutrition/nlis/info/malnutrition-in-women>

prevalences, while unskilled labor has the lowest overweight/obesity and highest underweight prevalence (10 percent).

Table 1. Nutritional status of 646 mothers in Yangon and rural Ayeyarwady, October–November 2023, by geographic and socioeconomic strata using global BMI classifications

Background characteristics	Sample share (%)	Mean body mass index (BMI)	Body Mass Index (BMI)				≥ 25 (Overweight/Obese) (%)
			<18.5 (Underweight) (%)	18.5-24.9 (Normal) (%)	25.0-29.9 (Overweight) (%)	≥30.0 (Obese) (%)	
Residence							
Yangon	96	24.4	6.6	52.4	30.2	10.5	41.0
Ayeyarwady	4	22.7	7.7	69.2	23.1	0.0	23.1
Education							
Primary	25	24.2	6.2	54.3	29.6	9.9	38.5
Secondary	30	23.9	8.3	58.6	23.3	9.8	33.2
High school	28	24.7	6.7	48.9	32.8	11.7	44.5
Tertiary	17	24.6	4.5	48.7	38.7	8.1	46.9
Asset class							
Asset-poor	44	23.6	9.5	58.3	23.7	8.1	32.2
Asset-low	46	24.8	5.0	50.0	33.7	11.0	45.0
Asset-rich	10	25.6	1.6	44.4	39.7	14.3	54.0
Livelihood							
Farming	5	25.8	6.7	36.7	43.3	13.3	56.7
Other livelihoods	1	26.9	0.0	20.0	40.0	40.0	80.0
Salary	38	24.3	5.3	56.7	27.1	10.9	38.1
Trade	27	25.1	5.8	46.6	35.6	12.1	47.7
Unskilled labor	29	23.4	9.5	57.9	25.8	5.8	32.6
Food insecurity							
FIES severe	7	22.5	4.6	68.2	25.0	2.3	27.3
FIES moderate	13	24.4	8.6	10.3	50.6	25.3	13.8
FIES mild	24	24.5	7.4	7.7	51.0	31.6	10.3
No food insecurity	56	24.5	5.6	52.8	31.4	10.3	41.7
Total	100	24.4	6.7	53.1	29.9	10.1	40.2

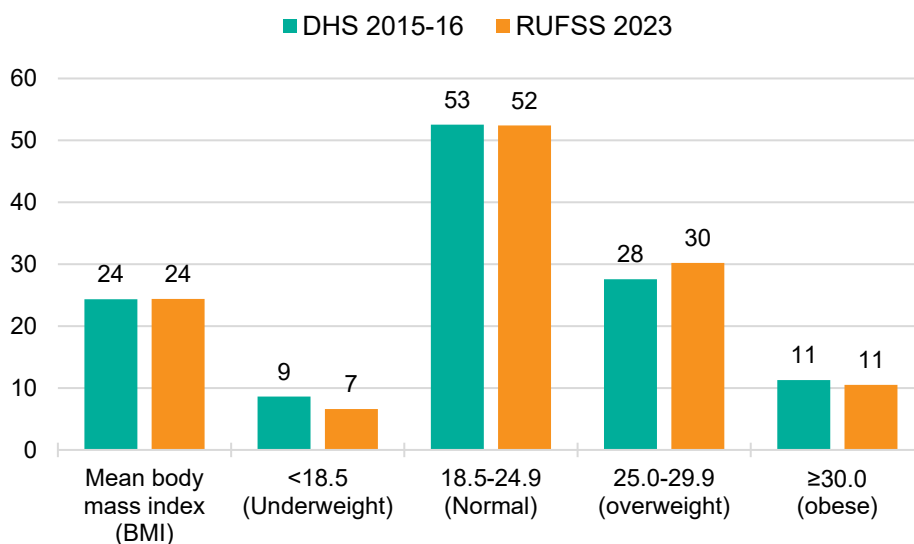
Source: RUFSS follow-up survey, October–November 2023. See the survey report for more details (MAPSA, 2024c).

Results for food insecurity classifications are somewhat different to asset classes, however. A surprisingly large share of women who report severe food insecurity experiences in their household are overweight/obese (27.3 percent): much higher than the shares for moderate food insecurity (13.8 percent) or mild food insecurity (10.3 percent). However, mothers who report being food-secure have the highest obesity rates. One explanation may be that mothers in very food insecure households have diets that chiefly comprised of cheap calorie dense foods, while wealthier mothers consume unhealthy foods more out of choice, convenience and social status than economic necessity.

Overweight/obesity is clearly an emerging problem in Myanmar, as it is in most low- and middle-income countries (Abarca-Gómez, et al., 2017). As noted above, the RUFSS sample is not strictly representative of mothers in Yangon compared to the Demographic Health Survey (DHS) conducted in 2015–16. In particular, RUFSS over-samples poorer peri-urban households compared to the DHS. Nevertheless, the sample is large and levels of maternal education in the DHS 2015–16 and RUFSS 2023 comparisons are similar, suggesting they may still be broadly comparable samples.

When compared to the DHS 2015–16, we find that mean BMI has risen from 23.5 percent in the Yangon DHS 2015–16 sub-sample to 24.4 percent in the RUFSS 2023 Yangon sample (Figure 2). We find that the rate of underweight women in Yangon is much lower in RUFSS (6.7 percent) compared to the DHS (11.9 percent), while there is an increase in the proportion of overweight or obese women (BMI ≥ 25) with 40.2 percent of Yangon mothers in RUFSS being overweight or obese compared to 38 percent in DHS 2015–16. Bearing in mind that (a) we under-sample better-off women and (b) we observe obesity rising with assets/wealth, we can conclude that the RUFSS estimate of 11 percent obesity is almost certainly an underestimate of the true rate of obesity among mothers in Yangon.

Figure 2. Comparison of mother’s BMI in Yangon between the 2015–16 Demographic Health Survey (DHS) and 2023 RUFSS



Source: Estimates in the blue bars are from the Myanmar DHS Yangon sub-sample for mothers of young children (MOHS & ICF-International, 2017). Estimates in the orange bars from the RUFSS follow-up survey Yangon sub-sample, October –November 2023. See the survey report for more details (MAPSA, 2024c).

Exploring dietary explanations of rising rates of overweight and obesity

In this section we explore potential explanations of rising rates of obesity. Unfortunately, we do not have information on exercise or energy expenditure, and it is possible that urbanization, technology adoption, high workloads or physical insecurity risks are reducing exercise or physical activity in general.

Bearing that in mind, Table 2 presents results on diets from the DQQ. The maternal dietary diversity score captures the range of healthy food groups consumed by a mother in the past 24 hours. Mothers who consume 5 or more food groups tend to have better micronutrient adequacy. However, only 52 percent of mothers have adequately diverse diets in this sample. All mothers consumed grains/roots/tubers in the past 24 hours, and 92 percent consumed at least some meat/poultry/fish. However, consumption of beans/pulses, nuts/seeds and eggs was 30–41 percent, while dark green leafy vegetable consumption and other vegetable consumption were both somewhat more prevalent at almost 60 percent. Vitamin A-rich fruit/vegetable consumption was low at just 20 percent, while other fruit consumption was more frequent (42 percent). Dairy consumption was just 8 percent.

Table 2. Maternal dietary diversity and consumption of healthy and unhealthy foods in the past 24 hours

	All mothers
Maternal dietary diversity score (0–10 food groups, past 24 hrs)	4.8 groups
Adequate dietary diversity (>4 food groups, past 24 hrs) (%)	52
10 Healthy foods, past 24 hrs	
Grains/roots/tubers (%)	100
Bean/pulses (%)	34
Nut/Seed (%)	30
Milk/Dairy (%)	8
Meat/Poultry/Fish (%)	92
Eggs (%)	41
Dark green leafy vegetables (%)	59
Vitamin A rich fruit/vegetables (%)	20
Other vegetables (%)	58
Other fruits (%)	42
6 Unhealthy foods, past 24 hrs	
Sweet food yesterday (%)	57
Soft drinks yesterday (%)	18
Fried food yesterday (%)	19
Fast food yesterday (%)	12
Salty snacks yesterday (%)	13
Processed meat yesterday (%)	3
Unhealthy eating index (0–6)	1.2 groups

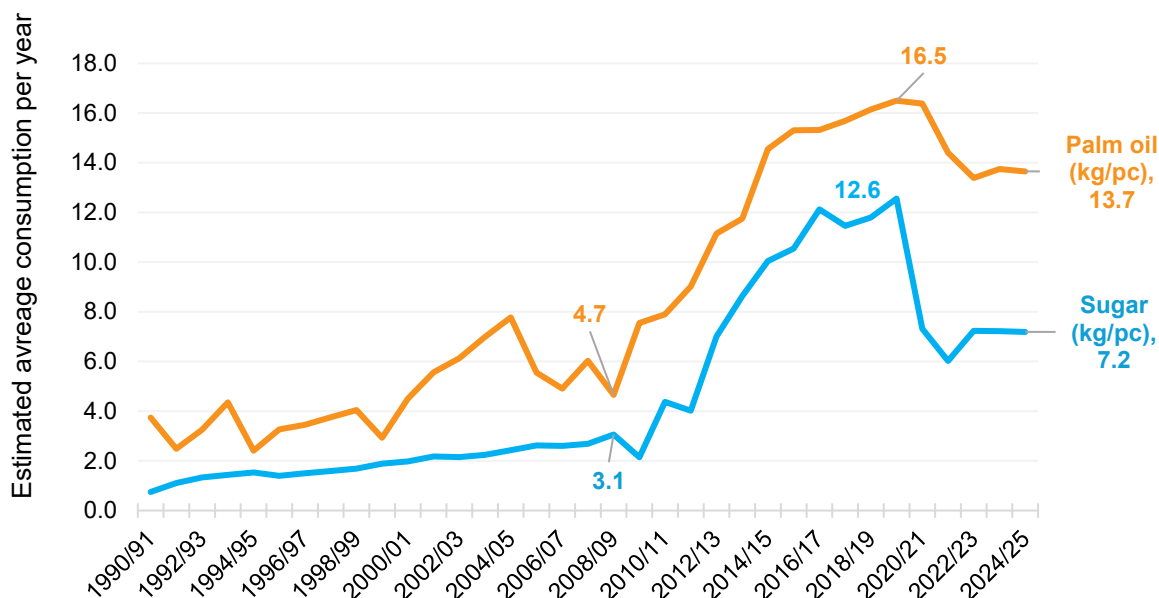
Source: RUFSS follow-up survey, October–November 2023.

Unhealthy food consumption was common, particularly sweet foods (57 percent), while around one in five women said they consumed soft drinks yesterday and fried food yesterdays, and 12–13 percent consumed fast food and/or salty snacks, while just 3 percent consumed processed meat.

While Table 2 shows that dietary quality is very poor in this sample, it is not immediately obvious which aspects of poor dietary patterns explain overweight and obesity. Sweet food consumption is high, suggesting high sugar consumption may play a role. However, another concerning feature of Myanmar diets is very high consumption of unhealthy cooking oils, particularly palm oil. Unfortunately, the DQQ does not yield information on quantity of oils/fats consumed – or quantities of foods in general – but qualitatively we know that consumption of oil is very high in Myanmar cuisine, especially Yangon.

To explore this further, Figure 3 reports trends in estimates of mean per capita consumption of palm oil and sugar in Myanmar over 1990–2024 from the US Department of Agriculture (USDA, 2024). Since the implementation of import liberalization policies in 2009, growth in both palm oil and sugar imports and consumption has been dramatic. Palm oil consumption was estimated to be 4.7 kg per capita per year in 2008/09, but this rose threefold to 16.5 kg per year in 2019/20 just prior to COVID-19. Sugar consumption rose from 3.1 kg to 12.6 kg. However, the economic collapse in 2021 and the sharp depreciation of the kyat led to a dramatic decline in sugar imports and consumption, and the most recent estimate suggests consumption is just 7.2 kg per capita per year. In contrast, palm oil consumption fell more modestly from 16.5 kg before the military takeover, to 13.7 kg in 2024. Hence, palm oil consumption has proved to be robust even in the face of massive economic shocks, high international prices and disruptions to imports.

Figure 3. Trends in estimated consumption of palm oil and sugar in Myanmar over 1990–2024 (mean kilograms per capita per year)



Source. Authors estimates from (USDA, 2024).

The growing consumption of oil, sugar and processed foods dense in oils/fats and sugars is possible in LMICs like Myanmar because of their very low retail cost. One global study showed that in 2011, oil and sugar – as raw ingredients – were cheaper sources of calories than cereals like rice, while more processed fat- and sugar-rich foods were especially cheap in Asia, generally much more so than healthy foods (Headey & Alderman, 2019).

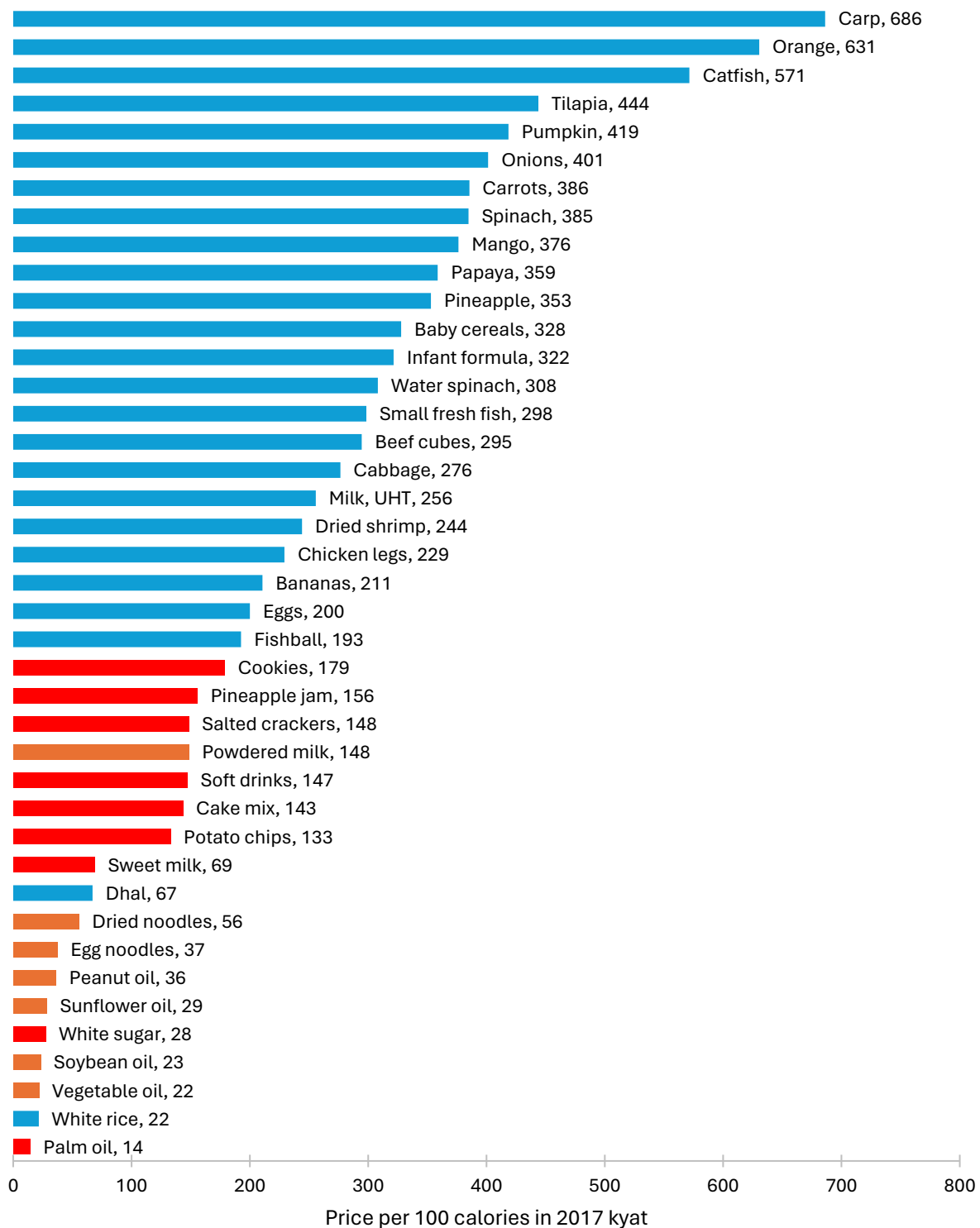
Figure 4 updates the analysis by Headey and Alderman (2019) to look at prices per 100 edible calories of various commonly consumed foods in Myanmar in 2017, which we classify into healthy

(blue bars) and unhealthy (red bars), while foods that are ambiguous in terms of their health implications are colored orange.³ The graph is ranked from cheapest to most expensive foods. We note that a few foods – like noodles – are somewhat ambiguous depending on condiments added, while products like sweetened milk have high levels of sugar, but also quite high levels of nutrients. Another point of note is that we only assess costs per calorie, not costs per nutrient: many healthy foods may be cheap sources of nutrients, but comparing costs per calorie is relevant for the poor, especially in an economic crisis, but highly food insecure households will always heavily factor in calorie density of foods when making food purchasing decisions (Headey & Alderman, 2019; Subramanian & Deaton, 1996).

The data show that all the cheapest foods are unhealthy (rice and dal are the only exceptions). The cheapest food/ingredient is palm oil at just 14 kyat per 100 calories, which is around half the cost of rice calories, and just 7 percent of the cost of fish-ball or egg calories (the cheapest healthy animal sourced foods) and 5 percent of the cost of bananas (the cheapest fruit). Of course, palm oil is an ingredient rather than a finished food. However, Figure 4 also shows that unhealthy snacks tend to be much cheaper than healthy fruits, vegetables, and animal sourced foods. Soft drinks are 43 percent cheaper than UHT milk, for example. In reality, the true cost differential between healthy and unhealthy foods is even larger than the estimates in Figure indicate most vegetables and animal sourced foods have preparation costs in terms of opportunity costs of cooking time, fuel costs for cooking, and storage costs for perishable foods, whereas processed foods and beverages generally have none of these costs, or at least very little costs (e.g. instant noodles). Thus, even in the context of declining real incomes, palm oil, sugar and unhealthy processed foods will be economically attractive options to poor households.

³ This includes other types of oils that may be healthy in appropriate quantities, and powdered milk that is only healthy when reconstituted with clean water.

Figure 4. Retail prices per 100 edible calories in 2017 kyat of various healthy (blue bars), unhealthy foods (red bars) and ambiguous foods (orange bars)



Source: Authors' calculations from International Comparison Program data collected in 2017 and collated by the World Bank (2020), using methods developed by Headey and Alderman (2019).

Conclusions

In this research note, we report results from one of the very few high-quality in-person nutrition surveys conducted since the emergence of COVID-19 and the military takeover in February 2021. Our main finding is very high rates of overweight/obesity (40 percent) by WHO standards. While we urge caution in inferring trends because RUFSS was not designed to be representative of all mothers in Yangon, these estimates are higher than the 2015–16 DHS Yangon sub-sample, suggesting obesity has risen among mothers in Yangon in the past decade or so. The same may be true of many other geographies of Myanmar, but we cannot be certain. We also find that maternal dietary quality is very poor, with low consumption of nutrient-dense foods and frequent consumption of unhealthy foods dense in calories, fats, sugar, and salt. While such poor-quality dietary patterns are likely due to a range of factors, including limited nutritional knowledge, economic factors likely also play a key role. Consumption of palm oil and sugar has rose at least threefold between 2010–2020, and data from 2017 show that unhealthy foods are generally much cheaper (in caloric terms) than healthier foods, but also more convenient and less perishable.

In policy and programmatic terms, rising obesity in Myanmar is a major public health concern, since obesity is a major risk factor for a wide range of non-communicable diseases (heart disease and diabetes in particular) that reduce life expectancy, increase morbidity, and reduce quality of life (Afshin, et al., 2019). These diseases impose major costs on the health system and the economy at large. Poor diets are multidimensional problems however, and require multisectoral solutions, including “double duty” interventions that address undernutrition as well as “overnutrition” (Hawkes, Ruel, Salm, Sinclair, & Branca, 2020). These include nutrition-related social behavioral communications change (SBCC) to improve nutritional knowledge and dietary practices, nutrition-sensitive social protection, taxation, and regulation of unhealthy foods (e.g. food labelling, preventing unhealthy food consumption in schools), and agricultural policies to improve productivity and year-round consumer access to healthy foods.

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Appendix

Table A.1. The prevalence of mothers with short stature (less than 145 cm)

Background characteristics	Sample share (%)	Mothers with short stature (< 145 cm) (%)
Residence		
Yangon	96	3.5
Ayeyarwady	4	3.9
Education		
Primary or lower	25	3.0
Secondary	30	2.5
High school	28	4.9
Tertiary	17	3.5
Asset class		
Asset-poor	44	4.1
Asset-low	46	3.3
Asset-rich	10	1.6
Livelihood		
Farming	5	10.0
Other livelihoods	1	0
Salary	38	3.6
Trade	27	3.4
Unskilled labor	29	2.5
Food insecurity		
FIES severe	7	0
FIES moderate	13	10.1
FIES mild	24	1.9
No food insecurity	56	3.0
Total	100	3.5

Source: RUFSS follow-up survey, October–November 2023.

Table A.2. Nutritional Status of 646 Mothers in Yangon and rural Ayeyarwady, October–November 2023, by geographic and socioeconomic strata using Asia-specific BMI classifications⁴

Background characteristics	Sample share (%)	Underweight <18.5 (%)	Normal 18.5 - <23 (%)	Overweight 23 – <27.5 (%)	Obese ≥ 27.5 (%)	Overweight or Obese ≥ 23 (%)
Current residence						
Yangon	96	7	32	39	23	61
Ayeyarwady (rural)	4	8	58	19	15	35
Mother's education						
Primary or lower	25	6	35	38	22	59
Secondary	30	8	36	36	20	56
High school	28	7	28	42	23	65
Tertiary	17	5	33	36	26	62
Asset class						
Asset-poor	44	10	37	37	17	53
Asset-low	46	5	32	37	26	63
Asset-rich	10	2	21	48	30	78
Main livelihood						
Farming	5	7	17	53	23	77
Other livelihoods	1	0	20	40	40	80
Salary	38	5	36	36	22	58
Trade	27	6	27	37	31	67
Unskilled labor	29	10	37	38	15	54
Food insecurity						
FIES severe	7	5	50	39	7	46
FIES moderate	13	10	33	33	23	56
FIES mild	24	7	27	43	22	65
No food insecurity	56	6	27	43	22	65
Total	100	7	33	38	22	60

Source: RUFSS follow-up survey, October–November 2023.

Notes: Excludes pregnant women and women with a birth in the preceding 2 months. Mother's nutritional status in terms of BMI (body mass index) is classified as ASIAN cutoff point.

⁴ WHO. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004; 363(9403):157–63. Epub 2004/01/17. [https://doi.org/10.1016/S0140-6736\(03\)15268-3](https://doi.org/10.1016/S0140-6736(03)15268-3)

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