



Nutrition Transition in the Philippines

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Abstract

The report examines evidence of dietary changes and the implications to nutritional and health status of various population groups in the country, and whether or not the Philippines is facing a “double burden” of undernutrition and overnutrition. Using data from the National Nutrition Surveys, the study finds that dietary changes occurring in Philippine households in the last 25 years are influenced by the food available to households and the increasing urbanization of the Philippine population. The dietary pattern in Philippine households particularly in the last 10 years is one of increasing energy density. While the increased intake of animal foods and fats and oils may have been a progress towards improving protein quality and bioavailability of important micronutrients, trade-offs in terms of increased cholesterol and saturated fats in the diets, coupled with sedentary lifestyles, have contributed to the significant evidence of dyslipidemia in adults and increasing overweight among adults as well as among adolescents. Nevertheless, underweight, stunting and micronutrient deficiencies especially among children persist in public health proportions. There is evidence that the country faces a “double burden” of undernutrition and overnutrition: persisting undernutrition especially among children, along with a rise in overweight, obesity and diet-related diseases among adults. Given the current economic and social trends, the dietary changes are likely to continue and, with changing lifestyle and physical inactivity, may exacerbate the emerging problems of overnutrition and diet-related chronic degenerative diseases.

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Introduction

Social, economic and demographic developments in the Philippines have led to the phenomenon called the “double burden” of undernutrition and overnutrition. This report presents the evidence of the country’s dietary changes and an emerging double burden of malnutrition and related health problems. The data presented here were from the Food and Nutrition Research Institute’s National Nutrition Surveys, which is described in www.fnri.dost.gov.ph.

Demographic changes represent one of crucial contributors to the country’s changing dietary patterns. The population has grown at an annual rate of 2.11 percent, and is expected to reach 102.8 million in 2015 from 85.5 million in 2005. Two important demographic trends in the last 30 years have been increased urban growth and migration. The population living in urban areas reached 59 percent in 2001, from 32 percent in 1970 and 54 percent in 1990. In general, the rural population has been moving to industrial zones in regions like the National Capital Region (NCR), Regions IV, X and XI. Women are also more likely to move out than men, and this has implications on food production and care giving. The relations between migrant communities in the urban centers and home communities in the rural areas have nonetheless been sustained by improved access to communication and mass media, which has favorably influenced preferences for processed foods and western foods even among rural dwellers in remote villages.

In terms of the economy, the Philippines has grown in the last years with a Gross National Product (GNP) and Gross Domestic Product that expanded at an average of 5.05 percent and 4.52 percent respectively from 2001 to 2004 (NEDA 2005). It has however been a boom-bust pattern of growth in the last 30 years (Fig.1). Underemployment and poverty have remained challenging issues. Estimates indicate that 24.7 percent of Filipino families were considered poor in 2003.

There has been progress in terms of health and social indicators. Life expectancy has increased to 67 years among males and 72 years in females (from an average of 58 years in the early 1970’s) and the infant mortality rate has decreased from 60 to 29 over roughly the same period (UNDP, 2004). Access to safe water, and levels of literacy and primary school enrollment have increased as well.

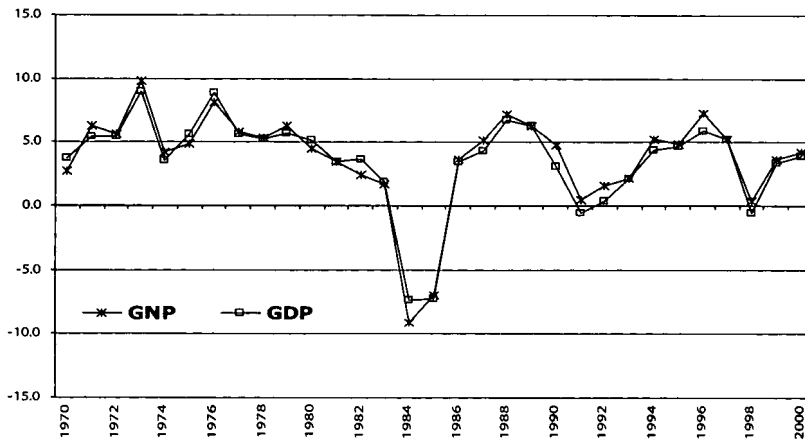
TABLE 1. Key Development Indicators

Indicator	Value	Year
Estimated Total Population	85.5 million	2005
Population Growth Rate	2.11%	2000-2005
Human Development Index (HDI), HDI rank	0.753, 83 rd	2002
Gender Development Index (GDI), GDI rank	0.751, 66 th	2002
GDP per capita (US\$)1,0262004		
Social Sector Expenditures (as % of total expenditure)	42.81%	2003
Share of poorest quintile in income or consumption	4.7%	2003
Share of richest quintile in income or consumption	53.3%	2003
Life Expectancy Male (at birth in years)	67.2	2003
Life Expectancy Female (at birth in years)	72.5	2003
Unemployment rate	10.9%	2004
Underemployment rate	16.9%	2004
Poverty headcount ratio (% of families below national poverty line) (<i>Preliminary</i>)	24.7%	2003
Population with access to safe water supply	80%	2002
Simple Literacy Rate	94%	2003
Elementary Participation Rate	90%	2002
Under-5 Mortality Rate (per 1,000 children)	40	2003
Maternal Mortality Rate (per 100,000 live births)	172	1998

Sources: Medium-Term Philippine Development Plan 2004 – 2010
 2004 UNDP Human Development Report
 Family Income and Expenditure Survey 2003

There have been significant changes as well with regard to food available to households, as an effect of increasing food imports such as flour, malt, frozen potatoes, cheese, butter, milk, and sugar confectionaries, among others (Figs 1a- 1b). These changes, which are related to globalization, have influenced the dietary and nutrition transition experienced in the country in the last quarter.

FIGURE 1. Real GNP/GDP Growth, 1970-2000



Source: Templo 2003

FIGURE. 1A. Food commodity imports (Ref: FAOSATAT 2005)

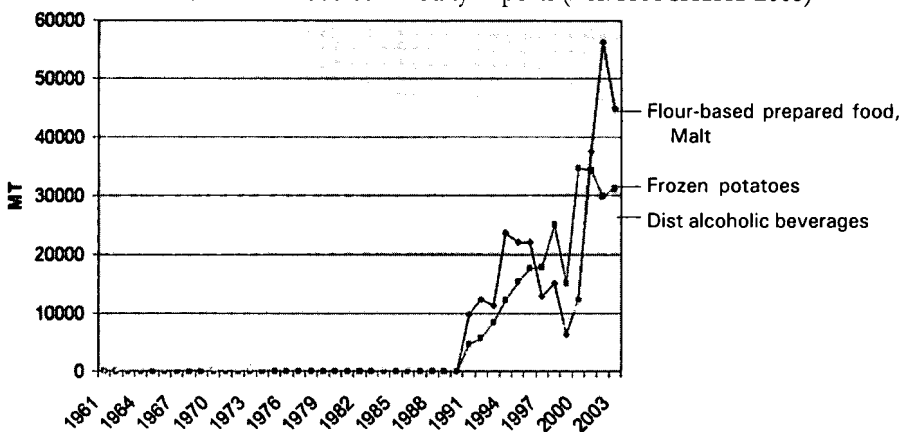
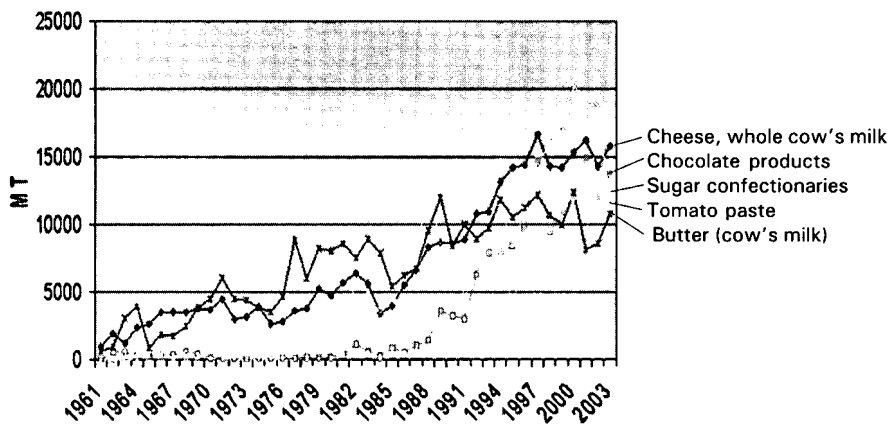


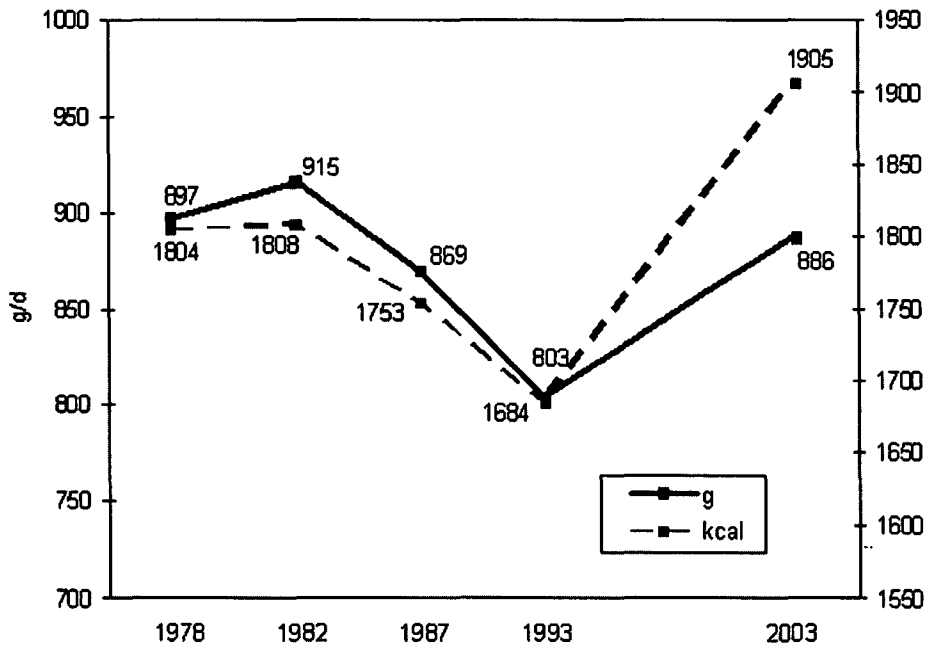
FIGURE. 1B. Food commodity imports (Ref: FAOSATAT 2005)



Dietary Changes 1978-2003

Food consumption, represented as raw As Purchased (AP) weight, has not changed significantly over the last 25 years. However, in terms of dietary energy, the mean one day per capita energy intake increased from 1,804 kilocalories (kcal) in 1978 to 1,905 kcal in 2003 (Figure 2). Thus, while the Filipino food intake has not increased in terms of weight, the energy density of diets has been increasing.

FIGURE 2. Trends in mean per capita food intake (g/day and kcal/day) in Filipino households, 1978 – 2003.



Source: National Nutrition Survey, Philippines, 1978, 1982, 1987, 1993, 2003
 Survey population: Nationally representative
 Sample size: 2, 800 (1978), 2, 280 (1982), 3, 200 (1987), 4, 050 (1993), 5, 514 (2003)

As shown in Table 2, the overall dietary pattern generally remains to be rice-vegetable-fish in Philippine households, contributing to 34 percent, 13 percent and 12 percent of food weight in 2003. The contribution of rice and fish has remained similarly proportioned over the past 25 years, while proportion of vegetables in the diet has declined slightly.

TABLE 2. Trends in mean per capita food consumption per day, Philippines, 1978-2003 (total and for selected food groups and sub-groups)

Food Group/Sub-group	Consumption, in grams/day, raw, As Purchased				
	1978	1982	1987	1993	2003
Cereals and Cereal Products	367	356	345	340	364
Rice and Products	308	304	303	282	303
Corn and Products	38	34	24	36	31
Other Cereals and Products	21	18	18	22	30
Starchy Roots and Tubers	37	42	22	17	19
Sugars and Syrups *	19	22	24	19	24
Fats and Oils**	13	14	14	12	18
Fish, Meat and Poultry	133	154	157	147	185
Fish and products	102	113	111	99	104
Meat and products	23	32	37	34	61
Poultry	7	10	9	14	20
Eggs	8	9	10	12	13
Milk and Milk Products	42	44	43	44	49
Whole Milk				35	35
Milk Products				9	14
Dried beans, Nuts and Seeds***	8	10	10	10	10
Vegetables	145	13	11	10	111
		0	1	6	
Green Leafy, Yellow Vegetables	34	37	29	30	31
Other Vegetables	111	93	82	76	80
Fruits	104	102	107	77	54
Vitamin-C Rich foods	30	18	24	21	12
Other Fruits	74	84	83	56	42
MISCELLANEOUS	21	32	26	19	39
Beverages****					26
Condiments					13
TOTAL FOOD (g/day)	897	915	869	803	886

*also includes softdrinks (sugar content), sherbet and similar preparations

** includes grated coconut and coconut milk (fat)

*** includes mungbeans, soybeans, peanuts & other dried beans, nuts

**** includes coffee, tuba (local wine), alcoholic beverages, others

NOTE: Numbers may not add up to totals due to rounding off.

Source: National Nutrition Survey, Philippines, 1978, 1982, 1987, 1993, 2003

Survey population: Nationally representative

Sample size: 2, 800 (1978), 2, 280 (1982), 3, 200 (1987), 4, 050 (1993), 5, 514 (2003)

Among cereals, the amount of intake of rice and products has generally not changed; the mean per capita intake fluctuated from 282 g in 1993, which was the lowest recorded intake in the 25-year period, to between 303 - 308 g during the other survey years including 2003. The consumption of corn, which is more common as a staple in combination with rice in Central and Southern Philippines, particularly in the rural areas, was generally declining, except in 1993. The intake of starchy roots and tubers was twice less in 2003 (19 g/day) compared with 1978 (37 g/day), reflecting the diminishing consumption of traditional and ethnic foods, such as native snacks made from locally available yams and tubers.

The consumption of “other cereals and cereal products,” which include, among others, breads and bakery products, noodles, and snack foods from wheat flour, peaked at 30 g in 2003 and increased by 36 percent over the per capita intake of 22 g in 1993. The intake of sugars and syrups, including softdrinks, increased. The consumption of softdrinks in particular increased by 150 percent over the per capita intake of two g in 1993 as compared with five g in 2003.

The consumption and contribution of vegetables and fruits to total food intake has declined. The intake of fruits, both vitamin C rich and other fruits, hit a low of 54 grams in 2003, a decrease of 50 grams per capita since 1978 and a steady 30 percent reduction during the periods 1987 – 1993 and 1993 – 2003. Among the vegetables, the intake of green leafy and yellow vegetables has been the same from 1987 to the 2003 while that of other vegetables increased by only four g in the past decade. The pattern of decreasing fruit and vegetable consumption is reflected in the declining proportion of households that consumed ³ 400 g fruits and vegetables per capita per day particularly in the last 10 years, from 11.5 percent in 1993 to 8.2 percent in 2003.

The intake of fats and oils, fish, meats and poultry, and milk and milk products increased, consistent with the Nutritional Guidelines for Filipinos that has called for improving diet quality by including more animal food, fats and oils, and milk and milk products. Overall, there was an increase in the contribution of animal food sources to total food intake (g), from 20 percent to 25 percent between 1978 and 1993, up to 28 percent in 2003 (Fig. 3). These increases, on the

FIGURE 3. Mean one per capita food intake by source, 1993 and 2003.

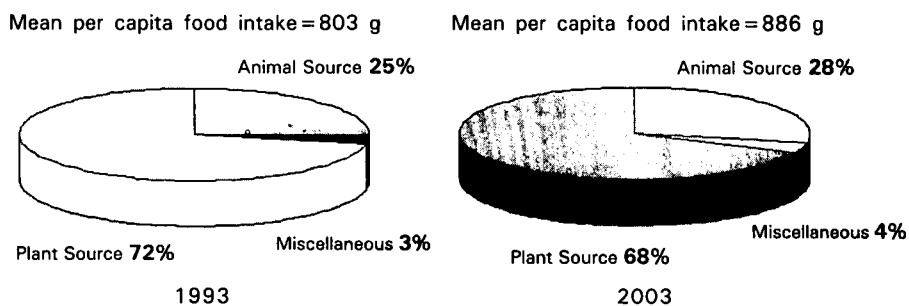


TABLE 3. Trends in per capita energy and nutrient intake and percent adequacy based on Philippine RDA and RENI's, 1978 - 2003

Nutrients	1978 ¹	1982 ¹	1987 ¹	1993 ²	2003 ³
Energy					
Intake (kcal)	1804	1808	1753	1684	1905
% Adequacy	88.6	89.0	87.1	87.8	98.3
Protein					
Intake (g)	53.0	50.6	49.7	49.9	56.2
% Adequacy	102.9	99.6	98.2	106.2	99.2
Iron⁴					
Intake (mg)	11.0	10.8	10.7	10.1	10.1
% Adequacy	91.7	91.5	91.5	64.7	60.1
Vitamin A					
Intake (ug RE)	-	-	389.7	391.9	455.2
% Adequacy	-	-	75.9	88.1	91.4
Calcium					
Intake (mg)	0.44	0.45	0.42	0.39	0.44
% Adequacy		80.4	75.0	67.0	57.1
Thiamin					
Intake (mg)	0.73	0.74	0.68	0.67	0.88
% Adequacy		71.8	66.7	68.4	86.3
Riboflavin					
Intake (mg)	0.53	0.58	0.56	0.56	0.73
% Adequacy		56.3	54.4	57.1	68.0
Niacin					
Intake (mg)	15.3	16.4	16.3	16.1	20.6
% Adequacy		119.7	119.9	68.0	156.4
Ascorbic Acid					
Intake (mg)	66.8	61.6	53.6	46.7	46.5
% Adequacy		91.1	80.0	73.2	75.0
Fats					
Intake (g)			29	29	38
Carbohydrates					
Intake (g)			324	310	333

¹ 1976 RDA for Filipinos

² 1989 RDA for Filipinos

³ 2002 RENI for Filipinos

⁴ Iron requirement in the 1993 RDA and 2002 RENI were higher compared to earlier RDAs. Niacin requirement in 1993 RDA was higher than 2002 RENI; calcium requirement was higher in 2002. These were due to methods of estimation.

Source: National Nutrition Survey, Philippines, 1978, 1982, 1987, 1993, 2003

Survey population: Nationally representative

Sample size: 2, 800 (1978), 2, 280 (1982), 3, 200 (1987), 4, 050 (1993), 5, 514 (2003)

other hand, may also be attributed to the increasing trend in the consumption of fast foods and could also signal a detrimental increase in saturated fat and cholesterol.

The changing diet patterns reflected on household nutrient intakes are shown in Table 3. The mean per capita intake of energy, protein, vitamin A, calcium, thiamin, riboflavin and niacin increased in 2003 from the levels in 1993 and earlier years. Intakes however remained inadequate for most other nutrients. The mean intake particularly for iron, calcium, riboflavin, and vitamin C were less than 80 percent of the recommended levels.

The declining intake of vitamin C over the years may be explained by the declining intake of vitamin C-rich fruits. There was no corresponding increase in iron intake in 2003, in spite of the reported increase in the intake of meat, because the increase in meat intake was mostly in the form of pork, which in general has lower iron content (0.8 mg/100g) than beef (2.8mg/100g).

The 1987 and 1993 NNS showed urban and rural differences in food, and energy and nutrient intakes. Generally, the intake of cereals and cereal products (specifically rice and corn products), starchy roots and tubers, fish, and vegetables, including green leafy and yellow, and other vegetables were higher in rural than in urban areas. Urban households, on the other hand, consumed more “other cereals and cereal products”, which include, among others, breads and bakery products, noodles and snack foods from wheat flour; sugars and syrups; fats and oils; meat and poultry; eggs; milk and milk products; dried beans, nuts and seeds; as well as vitamin-C rich fruits. Milk consumption increased in urban areas between 1987 and 1993, but decreased in the rural areas. Nonetheless, diet trends in the rural areas have followed that of urban areas. Like in the urban areas, the consumption of rice and products, starchy roots and tubers, and fruits in the rural areas decreased from 1987 – 1993, while that of “other cereals and cereal products” increased. This is a reflection of the introduction of urban tastes among rural dwellers, particularly by family members who have migrated or transiently moved to urban areas but continue to send food and money (Table 4).

These urban-rural differences are reflected in regional diet patterns revealed from the 2003 NNS. The consumption of “other cereals and cereal products,” fats and oils, meats and meat products, and milk and milk products was higher while that of vegetables was lower, in urban areas, such as the NCR, compared to the other regions, which had varying extent of urbanization. The regions with the highest proportion of urban population other than Metro Manila, specifically, Central Luzon and Calabarzon which are at least 60 percent urban, had higher consumption of “other cereals and cereal products,” meats and meat products, eggs, and milk and milk products than the regions that were less urbanized such as Cagayan Valley and Eastern Visayas. Central Luzon and Calabarzon had lower intake of starchy roots and tubers and vegetables than most of the rest of the regions that were less urbanized.

Table 4. Trends in per capita food consumption (g) by urban and rural residence

Food Group/Sub-group	Rural		Urban	
	1987	1993	1987	1993
Cereals and Cereal Products	361	350	318	318
Rice and Products	317	289	281	273
Corn and Products	31	55	11	17
Other Cereals and Products	13	16	26	28
Starchy Roots and Tubers	25	21	17	13
Sugars and Syrups*	22	17	26	20
Fats and Oils**	12	11	15	14
Fish, Meat and Poultry	145	133	174	161
Fish and products	109	99	112	97
Meat and products	28	23	52	44
Poultry	8	9	11	19
Eggs	8	9	13	15
Milk and Milk Products	34	24	56	64
Whole Milk	30	22	45	48
Milk Products	4	2	11	16
Dried beans, Nuts and Seeds***	9	8	11	11
Vegetables	104	102	91	86
Green Leafy, Yellow Vegetables	32	34	25	25
Other Vegetables	72	68	66	61
Fruits	115	84	123	93
Vitamin-C Rich fruits	31	26	44	39
Other Fruits	84	58	79	54
MISCELLANEOUS	27	16	24	23
Beverages****	13	6	10	11
Condiments	11	9	11	9
Others	3	1	3	2
TOTAL FOOD	<u>863</u>	<u>786</u>	<u>869</u>	<u>819</u>

* also includes softdrinks (sugar content), sherbet and similar preparations

** includes coconut grated and coconut milk (fat)

*** includes mungbeans, soybeans, peanuts & other dried beans, nuts

**** includes coffee, tuba, alcoholic beverages, others

NOTE: Numbers may not add up to totals due to rounding off.

Source: National Nutrition Survey, Philippines, 1987, 1993

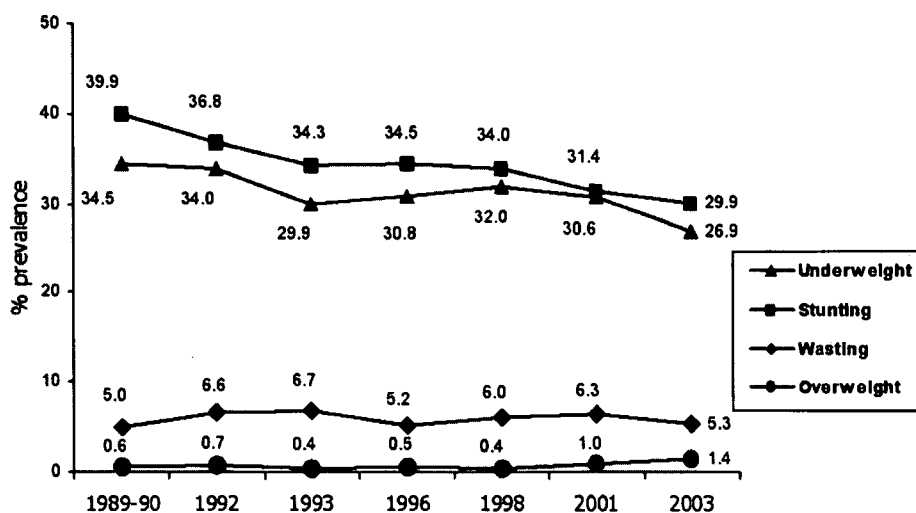
Survey population: Nationally representative

Sample size: 3, 200 (1987), 4, 050 (1993)

Changes in Nutritional Status

Data on the nutritional status of the Filipino population also come from the NNS rounds in 1993, 1998 and 2003 and the Regional Updating of the Nutritional Status of Children in 1989/90, 1992, 1996 and 2001.

FIGURE 4. Trends in the Prevalence of malnutrition among 0 – 5.9 y old children, 1989/90 – 2003.



Source: National Nutrition Survey, Philippines, 1993, 1998, 2003; Regional Updating of the Nutritional Status of Children 1989-90, 1992, 1996, 2001

Survey population: Nationally representative

Sample size: 8, 008 (1989-90), 7, 243 (1992), 24, 000 Household members (1993), 10, 385 (1996), 28, 698 (1998), 10, 634 (2001), 4, 110 (2003)

Reference: International Reference Standard/NCHS Growth Reference.

Underweight = weight-for-age < -2SD; Wasting = weight-for-height < -2SD;

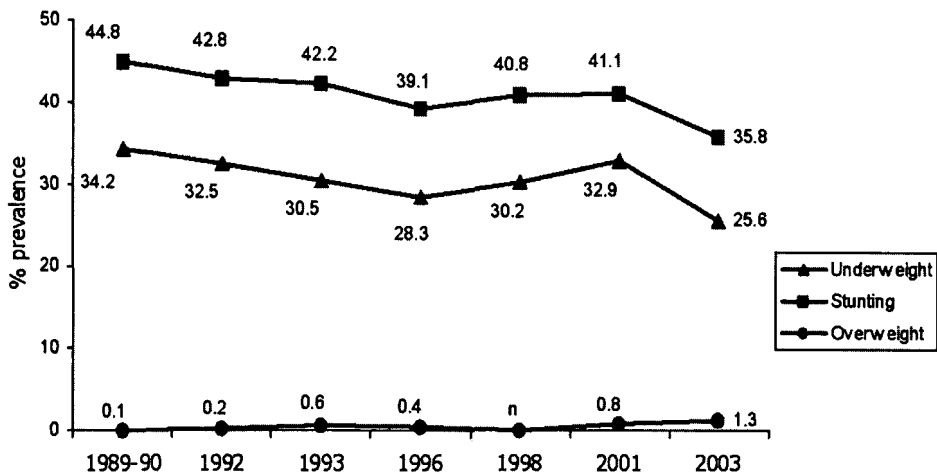
Stunting = height-for-age < -2SD; Overweight-for-age = weight-for-age > 2SD)

Undernutrition among children continues to be a public health problem. In 2003, underweight and stunting still affected three out of every 10 children 0 – 5.9 years of age (Fig. 4) and 6 -10.9 (Fig. 5) years old. Using 2003 population projections based on 2000 census data from the National Statistics Office, there are 3.2 million underweight 0 – 5.9 year-old children and 2.4 million underweight 6 – 10.9 year-old children; and 3.4 and 3.3 million stunted 0 – 5.9 and 6 – 10.9 year-old children respectively.

There has been however a declining prevalence of undernutrition, specifically underweight and stunting, in both groups of children from 1989/90 to 2003. Within this period, the

proportion of underweight 0 – 5 year-old children declined 7.6 percentage points, from 34.5 percent to 26.9 percent (0.58 percentage point reduction a year); among the 6 – 10 year-old children, the prevalence of underweight was reduced by 8.6 percentage points, from 34.2 percent to 25.6 percent (or 0.66 percentage point reduction a year). Stunting among 0 – 5 and 6 – 10 year-old children also declined 10.0 (0.77 percentage point a year) and 9.0 (0.69 percentage point a year) percentage points, respectively. Meanwhile, the picture of acute malnutrition (wasting) among 0 – 5 year-old children has not improved. The prevalence increased from 5.0 percent in 1989/90 to 5.3 percent in 2003.

FIGURE 5. Trends in the Prevalence of Malnutrition among 6 – 10.9 y old children, 1989/90 – 2003.



Source: National Nutrition Survey, Philippines, 1993, 1998, 2003
 Regional Updating of the Nutritional Status of Children 1989-90, 1992, 1996, 2001
 Survey population: Nationally representative
 Sample size: 4, 306 (1989-90), 5, 636 (1992), 24, 000 Household members (1993), 15, 530 (1996), 3, 040 (1998), 1, 791 (2001), 3, 436 (2003)
 Reference: International Reference Standard/NCHS Growth Reference. Underweight = weight-for-age < 2SD; Stunting = height-for-age < -2SD; Overweight-for-age = weight-for-age > 2SD)

Overweight, although affecting a smaller proportion among the children (1.4 percent and 1.3 percent of the 0 – 5.9 and 6 – 10.9 year-old children, respectively), has increased significantly between 1998 and 2003. The prevalence of overweight among both groups of children in 1989/90 and 1998 was unchanged. It increased in 2003 by nearly three-fold among the 0 – 5.9 year-old children and more than 10-fold among 6 – 10.9 year-old children from the 1998 levels.

Among adults, undernutrition or Chronic Energy Deficiency (BMI < 18.5) affected 12.3 percent in 2003. Based on the WHO cut-off of 3-5 percent BMI below 18.5 for a healthy

adult population (WHO, 1995), adult undernutrition in the Philippines is also a nutrition problem that needs to be addressed. On the other hand, 24 percent of adults are overweight (BMI 25 - < 30) or obese (BMI \geq 30), with more females (27.3 percent) than males (20.9 percent) who are affected. While progress in reducing adult undernutrition has been slow (about 10 percent reduction over 10 years), adult overweight and obesity has been increasing steadily by 20 percent between each five-year interval from 1993 - 2003.

TABLE 5. Prevalence of Underweight and Overweight among Adults

Gender/Age	Underweight [*]			Overweight/Obese ^{**}		
	1993	1998	2003	1993	1998	2003
	% Prevalence					
Male	11.5	11.1	10.6	14.4	17.0	20.9
Female	16.1	15.4	14.2	18.6	23.3	27.3
M & F						
20-39	11.0	11.2	10.6	14.4	18.5	20.6
40-59	14.5	12.0	10.4	23.2	25.3	30.8
60 & over	29.1	25.4	23.4	11.4	14.6	19.1
All	13.9	13.2	12.3	16.6	20.2	24.0

Source: National Nutrition Survey, Philippines, 1993, 1998, 2003

Survey population: Nationally representative

Sample size: 24, 000 Household members (1993), 9, 299 (1998), 11, 696 (2003)

Reference: Underweight/ Chronic Energy Deficiency (CED) - BMI < 18.5, ^{*} Overweight/Obese - BMI \geq 25

Using the BMI cut-off points recommended by the WHO Expert Consultation to determine public health and clinical action in relation to cardiovascular disease (i.e., BMI 23 – 27.4 = Moderate Risk; BMI \geq 27.5 = High to Very High Risk), the proportion of Filipino adults with moderate to very high risk to co-morbidities related to cardiovascular disease reaches even more significant proportions (Table 6) than looking simply at figures of overweight or obesity (Table 5).

Meanwhile, micronutrient deficiencies are a public health problem in the Philippines. Based on the 2003 National Nutrition Survey, vitamin A deficiency affected 40 percent of 6-59 months old children, 18 percent of pregnant women and 20 percent of lactating mothers. Anemia, which is a measure of iron deficiency, affects 66 percent of infants from six months to less than one year of age; this rate is higher than in 1998 (57 percent). Although the anemia prevalence among pregnant (44 percent) and lactating women (42 percent) was lower in 2003 than in 1998 (51 percent and 46 percent, respectively), the levels still indicate a serious

public health problem. A major reason for the continued high prevalence of vitamin A deficiency and anemia is the inadequate intake of dietary vitamin A and iron. This situation exists despite an on-going fortification program of commercially available and highly processed foods, and the fortification of staples (oil, flour, sugar and rice) as a population approach to manage micronutrient deficiencies.

TABLE 6. Distribution of adults by cut-off points for determining public health and clinical action related to co-morbidities of CVD based on BMI

Age Group (in Years)	CED	Low Risk	Moderate Risk	High Risk
	(< 18.5)	(18.5 to <23.0)	(23.0 to ≤27.4)	(≥ 27.5)
20-39	10.6	53.0	27.4	9.0
40-59	10.4	40.6	34.8	14.1
60 and Over	23.6	43.7	24.2	8.5
All	12.4	47.4	29.5	10.7

Reference: WHO Expert Consultation, 2004: CED (BMI < 18.5), Low Risk (BMI - 18.5 to <23.0), Moderate Risk (BMI - 23.0 to ≤27.4) High Risk (BMI ≥ = 27.5)

Trends in Prevalence of Diet-Related CVD Risk Factors 1998-2003

While the dietary changes have been slow in contributing to significant impacts on the micronutrient situation, particularly VAD and anemia, the same has begun to pose a growing threat to the health of the population in terms of chronic lifestyle-related diseases, including cardiovascular diseases (CVD). Data in the last five years indicate increasing prevalence of nutrition-related risk factors to CVD among Filipino adults 20 years of age and over, including overweight and obesity which were discussed earlier, hypertension, dyslipidemia and diabetes.

Hypertension

The proportion of Filipino adults who were diagnosed as hypertensive based on blood pressure (Systolic BP > 140 mm Hg or Diastolic BP > 90 mm Hg) in the 2003 NNS was 22.5 percent. The prevalence of hypertension among Filipino adults in that year had significantly increased from 21 percent in 1998, and remained high among the middle-aged adults and elderly – from 26.4 percent among the 40-49 years, 40.2 percent among the 50-59 years, 45.8 percent among the 60-69 years and 56 percent among the 70 years old and over age groups.

TABLE 7. Trends in the prevalence of hypertension among Filipino adults 20 years old and over, 1998 and 2003

Gender	Age group	1998	2003
		Prevalence in %	
M & F	20-29	11.3	8.8
	30-39		14.1
	40-49	29.0	26.4
	50-59		40.2
	60-69	44.3	45.8
	70 +		56.0
	All	21.0	22.5

Source: National Nutrition Survey, Philippines, 1998, 2003

Survey population: Nationally representative

Sample size: 9, 299 (1998), 20 – 39 y = 1,402, 40 – 59 y = 1,021, 60 y = 2,330 (2003)

Reference: Hypertension (Systolic > 140 mm Hg; Diastolic > 90 mm Hg)

Dyslipidemia

The prevalence of hypercholesterolemia among Filipino adults in 2003 was 8.5 percent, which is more than twice the rate of four percent in 1998. There was a significant increase in the prevalence of hypercholesterolemia between the periods particularly among the middle-aged and older adults, and the condition remained significantly higher among the middle-age adults (10 – 20 percent) and the elderly (15 percent) than younger adults.

The prevalence of elevated LDL-cholesterol among Filipino adults in 2003 was 3.7 percent. This is significantly higher than, and also nearly twice, the 1998 rate of two percent. By age category, the prevalence of elevated LDL-cholesterol was significantly increased within the five-year period among the middle-aged adults and the elderly.

The increasing trend in hypercholesterolemia and elevated LDL-cholesterol may be associated with the increase in consumption of animal-based foods, particularly meats, and possibly fats and oils, as well as the decreasing fruit and vegetable consumption.

There is also no evidence of an increasing prevalence of elevated triglycerides that could be associated with the increasing consumption of fats and oils (which is mostly coconut oil) in Philippine households. Overall, less than one percent (0.7 percent) of Filipino adults had elevated triglycerides, which was only slightly lower than the 1998 rate (0.8 percent).

TABLE 8. Trends in dyslipidemia among Filipino adults 20 years old and over, 1998 and 2003.

Age group	Elevated total cholesterol ¹		Elevated LDL-cholesterol ²		Low HDL-cholesterol ³	Elevated triglycerides ³	
	1998	2003	1998	2003	2003	1998	2003
20-29	3.0	3.3	1.7	1.5	2.9	0.4	0.4
30-39		6.0		2.1	3.2		0.4
40-49	5.8	9.6	2.5	4.5	4.9	1.4	1.3
50-59		19.9		8.3	3.8		1.2
60-69	4.11	5.6	2.3	7.4	2.9	0.4	0.8
70+		15.4		7.0	4.2		1.1
All	4.0	8.5	2.0	3.7	3.5	0.8	0.7

Diabetes

The Philippine data also show no evidence of a trend towards an increasing prevalence of Diabetes Mellitus. It is surprising that there was no increase in the prevalence of Diabetes Mellitus while obesity increased significantly. The proportion of Filipino adults with Diabetes Mellitus was 3.9 percent in 1998, and 3.4 percent in 2003. However, the proportion of Filipino adults with Impaired Fasting Blood Glucose, a pre-diabetic condition that puts increased risk to diabetes, was 3.2 percent in 2003 (FBS = 100 – 125 mg/dL) compared to only 2.5 percent in 1998 (FBS = 110 – 125 mg/dL).

TABLE 9. Trends in the prevalence of Impaired Fasting Blood Glucose^a and Diabetes Mellitus^b among Filipino adults, 20 years old and over, 1998 and 2003

Gender	Age group	1998 ^a		2003 ^b	
		% Prevalence			
		Impaired Fasting Glucose ^a	Diabetes Mellitus Glucose ^b	Impaired Fasting	Diabetes Mellitus
M & F	20-29	1.9	2.6	1.2	0.7
	30-39			2.1	2.0
	40-49	3.1	5.4	5.0	4.9
	50-59			5.7	8.9
	60-69	3.2	6.2	5.6	6.3
	70+			6.2	5.1
	All	2.5	3.9	3.2	3.4

Source: National Nutrition Survey, Philippines, 1998, 2003

Survey population: Nationally representative

Sample size: 9, 299 (1998), 20 – 39 y = 1,402, 40 – 59 y = 1,021, 60 y = 2,330 (2003)

Reference: ^a Impaired Fasting Glucose: (FBS = 110 - 125 mg/dL, WHO Technical Report Series 1985) ;

^b (FBS = 100 – 125 mg/dL, ADA), ^c Diabetes mellitus: (FBS ³ 126 mg/dL)

Conclusion

The dietary changes that have occurred in Philippine households in the last 25 years are reflections of the increasing urbanization of the country. Urban diets have been associated with increasingly Westernized food habits, such as high-fat diets, processed foods and refined carbohydrates. Data from the Philippines exhibit a pattern of increasing intakes of fats and oils, sugars and syrups, meats and processed meat products, and other cereals and cereal products (including breads and bakery products, noodles, and snack foods made from wheat flour), and declining fruit and vegetable consumption. It is likely that these trends will continue given the escalating urbanization of the Philippine population, coupled with increasing availability and variety of processed and fast foods, the frequency of eating outside the home, the use of computers and computer games, and the influence of mass media.

While the improvements in diets have been in the direction of dietary goals and Philippine nutritional guidelines, including increasing the intakes of animal foods (“to increase good quality proteins and absorbable iron to satisfy nutritional requirements”) and fats and oils (“as a remedy to caloric deficiency and to help lower the risk of vitamin A deficiency by facilitating its absorption and utilization”), the Philippines’ progress in achieving the Millennium Development Goals still falls short of the rate necessary to meet the target. In spite of increased consumption of the food sources of iron, calcium and riboflavin, as demonstrated by increasing intake of animal source foods – including meats and dairy – these nutrients remain inadequate. The trade-offs of increased consumption of animal foods and fats and oils are increased cholesterol and saturated fats in diets, and increased overweight in children, adolescents and adults when coupled with sedentary lifestyles. The trend towards increasing obesity, hypercholesterolaemia and elevated LDL-cholesterol, which are known risk factors for CVD, is alarming. There has been increasing mortality from diseases of the heart and vascular system, which in the last 10 years have become the top two leading causes of death in the country. While consumption of animal foods and fats and oils, prevalence of obesity, hypercholesterolaemia and elevated LDL-cholesterol, and mortality from CVD and other non-communicable diseases (NCDs) are moving in the same direction, the consumption of fruits and vegetables and other traditional staples such as maize and root crops has steadily declined over time.

Although there has been progress in addressing undernutrition in the Philippines, it is still a problem of far greater magnitude than overnutrition is, especially among children. Out of every 100 children aged zero to five years, 27 are underweight-for-age, 30 are stunted, more than 30 are anaemic, 40 are vitamin-A deficient, and only one is overweight. Out of every 100 children aged six to 10 years, 27 are underweight, 37 are stunted, 37 are anaemic, 11 are iodine deficient, and again only one is overweight. The burden of undernutrition is also greater among 11-to-12-year-olds and 13-to-19-year-olds, with six underweight to every

overweight child in the former, and four underweight to every overweight child in the latter age group. Among adults, on the other hand, there are twice as many cases of overweight as underweight.

The evidence that the country is facing a double burden of malnutrition is seen in terms of the coexistence at the population level of undernutrition among children and the elderly with overnutrition among adults. The malnutrition double burden within households, e.g., an underweight child and an overweight mother, is also reported to be emerging, with prevalence of 8.2 percent in one poor urban community, rising to about 20 percent in a high-income urban community (Agdeppa, Laña and Barba, 2003). There is increasing scientific evidence to support Barker's hypothesis that chronic diseases such as CVD, diabetes and hypertension in later life may have their origins in fetal cardiovascular, metabolic and endocrine adaptation to intrauterine undernutrition (Aggett and Schofield, 2000). The prevalence of low birth weight, which is associated to fetal undernutrition, was estimated to be about nine to 11 percent in the 1990-1997 period, rising to about 18 percent in 1995-2000. Based on this hypothesis, the increasing prevalence of NCDs may also be associated with maternal and fetal undernutrition. Thus, addressing undernutrition from early life, including pre-pregnancy and maternal undernutrition, will contribute to reducing NCDs in the country. That overnutrition increases with age should also emphasize that programs for the prevention of overweight/obesity and NCDs in later life should start in children, particularly increasing physical activity and exercise.

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