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Philippines 2007 NTA: Consumption, Labor Income, and Lifecycle Deficit by Income Group

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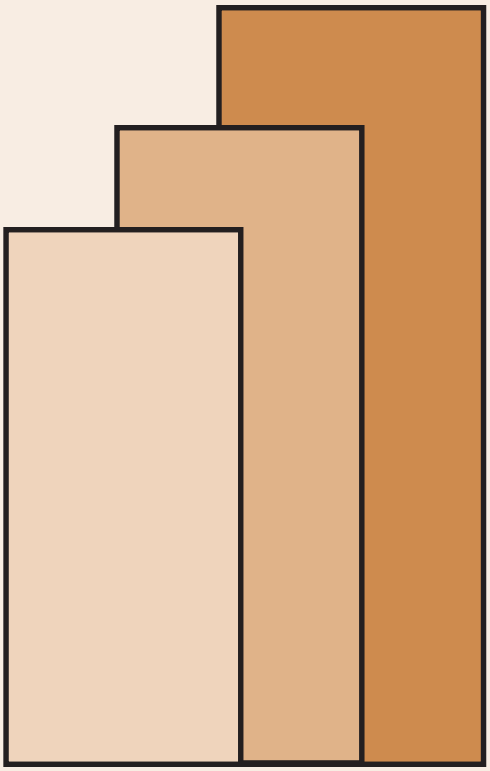

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Philippines 2007 National Transfer Accounts (NTA): Consumption, Labor Income and Lifecycle Deficit by Income Group[1]

Rachel H. Racelis, Michael Ralph M. Abrigo and J.M. Ian S. Salas[2]

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Abstract

The NTA flow accounts for the Philippines for the year 2007 includes not only national level estimates but also estimates by income group. Three income groups are defined, referred to as income terciles. This paper compares age profiles of consumption and labor income across income groups. The age profiles were generally found to have the expected shapes but the profiles also showed the progressively lower per capita consumption and labor income at each age as one moves from the top tercile and on to the middle and bottom terciles. Other key findings include: (1) the young incur lifecycle deficit longer in the bottom tercile (age 30 years) compared to the middle and top terciles (ages 26 and 24 years, respectively); (2) the elderly incur lifecycle deficit earlier in the bottom tercile (age 53 years) compared to the middle and top terciles (ages 56 and 59 years, respectively); (3) the young deficit age groups account for 66, 57 and 42 percent of aggregate consumption in the bottom, middle and top income terciles, respectively; (4) the spans of the surplus ages are shorter for the bottom and middle terciles (22 and 29 years, respectively) compared to that for the top tercile (34 years); (5) the elderly deficit age groups account for 8, 9 and 11 percent of aggregate consumption in the bottom, middle and top income terciles, respectively; (6) the ratio of the surplus generated by the working age group to the total lifecycle deficits of the dependent populations were computed to be 9, 22 and 41 percent for the bottom, middle and top income terciles, respectively.

Keywords: National Transfer Accounts, consumption age profile, labor income age profile, lifecycle deficit, consumption by income group, lifecycle deficit by income group

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Philippines 2007 National Transfer Accounts (NTA):
Consumption, Labor Income and Lifecycle Deficit by Income Group

Rachel H. Racelis, Michael Ralph M. Abrigo and J.M. Ian S. Salas

1. Introduction

NTA is a comprehensive system of accounts that measures the economic lifecycle and the associated economic support systems. Consumption and labor income age profiles, and economic flows from members of specific age groups to other age groups, referred to in NTA as age reallocation or intergenerational transfers, are measured at the aggregate level and for a prescribed period of time. The NTA reports age reallocations by type of channel or system through which these are mediated. (General references on NTA include Lee, Lee and Mason 2005, Mason et. al. 2005 and Mason, et. al. 2009).

The first set of NTA flow accounts for the Philippines was estimated for the year 1999, and methods and results are discussed in Racelis and Salas (2007) and Salas and Racelis (2008), respectively. Selected NTA components, more specifically age profiles of consumption and labor income, were also estimated for the years 1994 and 2002 (Racelis and Salas 2008a; Racelis and Salas 2011). All these NTA estimates for previous years were done at the national level only.

The NTA flow accounts for the Philippines for the year 2007 includes estimates not only at the national level but also by income group. Three income groups are defined, referred to as income terciles: bottom tercile (lowest income group), middle tercile and top tercile (highest income group). The national level results of the 2007 NTA are discussed in Abrigo, Racelis and Salas (2012). The 2007 NTA results by income group are analyzed in two parts (and reported in two separate papers): first, comparing age profiles of consumption and labor income across income groups; and, second, comparing finance of consumption for the deficit age groups across income groups. This paper covers the first part.

Section 2 describes the methods and data used to estimate the 2007 Philippines NTA age profiles. Section 3 provides an overview of the consumption and labor income age profiles estimates by income group in the 2007 Philippines NTA. Section 4 examines and compares the per capita age profiles of specific components of consumption and labor income across income groups. Section 5 summarizes and concludes.

2. Methods and data

The main sources of data for the estimation of components of the 2007 Philippines NTA Flow Account by income group include: the 2007 National Income Accounts obtained from the National Statistical Coordination Board (NSCB), specifically

the Income and Outlays breakdown; the most recent estimates available of National Health Accounts and National Education Expenditure Accounts (also from the NSCB); the 2006 Family Income and Expenditure Survey (FIES) and the 2007 Annual Poverty Indicator Survey (APIS) obtained from the National Statistics Office (NSO); and government finance and budget documents containing 2007 data obtained from the Department of Budget and Management (DBM) and the Commission on Audit COA).

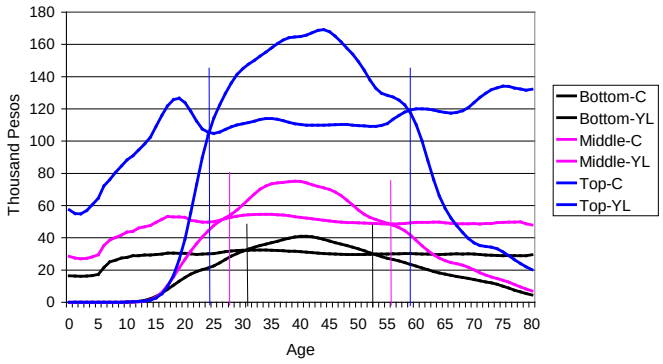
It is important to know the estimation methods to be able to understand and interpret the age profiles appropriately. The methods used to estimate the consumption and labor income age profiles of the Philippine NTA for earlier years are described in Racelis and Salas (2007) and these were generally followed in the estimation of the 2007 NTA. But additional steps were needed to produce the age profiles by income group and these are described in Appendix A.

3. Consumption, labor income and lifecycle deficit by income group

Per capita age profiles

Per capita consumption and labor income age profiles by income group are shown in Figure 1. The age profiles generally have the expected shapes but the profiles also show the progressively lower per capita consumption and labor income at each age as one moves from the top tercile and on to the middle and bottom terciles. The difference in overall levels of per capita consumption and labor income across income groups is discussed further later in this section and in Section 4.1.

Figure 1. Age profile of per capita consumption (C) and labor income (YL) by income tercile group, Philippines, 2007, current prices (in PhP thousands)



The consumption age profile for the top tercile shows two distinct patterns compared to the age profiles for the bottom and middle terciles: the clear hump between the ages 15 to 21 years; and the sharp rise after age 60 years. The first pattern reflects the high private investment in college education and the second pattern reflects the high private health spending for its elderly members by households belonging to the top tercile. The labor income age profile for the top tercile similarly has distinct patterns: labor income peaks at a later age (44 years compared to 39 and 41 years for the middle

and bottom terciles, respectively); and per capita income remains significantly high even after age 70 years.

An age group is defined to be in (lifecycle) deficit when their consumption exceeds their labor income. Deficit age cut-offs, the ages at which the per capita consumption and labor income age profiles intersect, differ across income groups. Compared to the top tercile, in the middle and bottom terciles the young are in deficit much longer and the elderly go into deficit earlier (Figure 1 and Table 1). Thus, the spans of the surplus ages are shorter for the bottom and middle terciles (22 and 29 years, respectively) compared to that for the top tercile (34 years).

Aggregate age profiles

Figure 2. Age profile of aggregate consumption (C) and labor income (YL) by income tercile group, Philippines, 2007, current prices (in PhP billions)

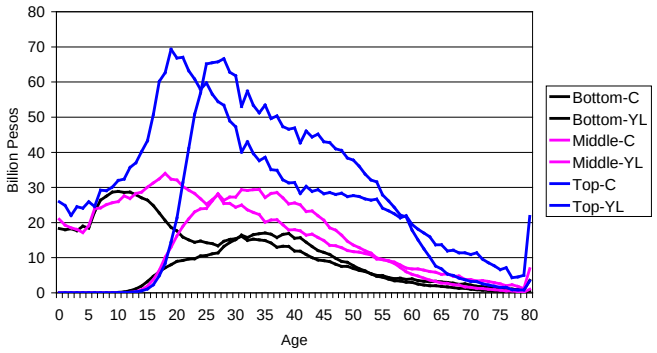
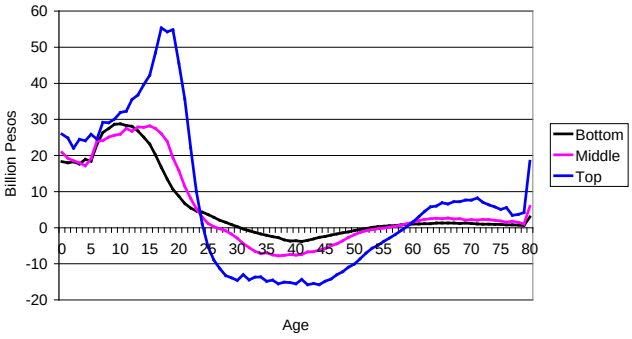


Figure 3. Age profile of aggregate lifecycle deficit by income tercile group, Philippines, 2007, current prices (in PhP billions)



The aggregate age profiles by income group for consumption and labor income, and for lifecycle deficit (aggregate consumption minus aggregate labor income) are shown in Figures 2 and 3 and the values from the aggregate profiles are summarized in Tables 1 and 2. Aggregate age profiles are produced by multiplying per capita means by age (of consumption, labor income and their components) to the corresponding population size at each age.

As may be noted from Table 1, the sizes of the aggregate lifecycle deficit do not seem very different between the income tercile groups. But the aggregate consumption

and aggregate labor income of the top tercile are more than two times and about four times of those for the middle and bottom terciles, respectively. Thus, the aggregate deficits that are nearly similar in terms of level across income groups actually represent 22, 33 and 48 percent of aggregate consumption of the top, middle and bottom terciles, respectively.

Table 1. Aggregate consumption, labor income and lifecycle deficit by income tercile group: Philippines, 2007, current prices (in billion PhP)

		Income tercile group		
Item description	Total	Bottom	Middle	Top
Lifecycle deficit	1,453	459	441	553
Consumption	4,770	959	1,341	2,469
Public	654	269	218	166
Education	151	68	53	31
Health	44	17	15	12
Other	459	185	151	124
Private	4,116	690	1,123	2,303
Education	226	18	40	168
Health	151	13	30	108
Other	3,739	658	1,053	2,027
Total	4,770	959	1,341	2,469
Education	377	86	93	198
Health	194	30	44	120
Other	4,198	843	1,204	2,151
Labor Income	3,316	501	900	1,916
Earnings	1,991	202	523	1,266
Self-employed	1,321	294	377	650
Deficit age cut-off				
Young		30	26	24
Elderly		53	56	59

Private consumption pattern for education and health differ across the income groups. Private spending for education is 2.6, 3.6 and 7.3 percent of total private consumption for the bottom, middle and top income tercile, respectively. Similarly private spending for health is 1.9, 2.6 and 4.7 percent of total private consumption for the bottom, middle and top income tercile, respectively.

The composition of labor income also differs significantly across income groups. Salaries and wages or earnings account for 40 percent and self-employment income 60 percent of total labor income of the bottom tercile. The percentage accounted for by self-employment income decreases to 42 percent and 34 percent for the middle and top terciles, respectively.

Table 2. Aggregate consumption, labor income and lifecycle deficit by age group and by income tercile group: Philippines, 200, current prices, (in billion PhP)

NTA component / income group	Total	Age group		
		Young deficit age group	Surplus age group	Elderly deficit age group
Lifecycle deficit	1,453	1,802	-558	209
Bottom tercile	459	477	-46	27
Middle tercile	441	518	-127	50
Top tercile	553	807	-386	132
Consumption	4,770	2,434	1,874	461
Bottom tercile	959	634	250	75
Middle tercile	1,341	761	458	122
Top tercile	2,469	1,039	1,166	264
Labor Income	3,316	632	2,432	252
Bottom tercile	501	157	295	48
Middle tercile	900	243	584	73
Top tercile	1,916	232	1,552	132

As noted previously overall aggregate lifecycle deficit are nearly equal across income groups, but a comparison of the lifecycle deficit pattern by age group shows considerable variation. These include the following (Figure 3 and Table 2): (1) aggregate deficit of the young age group for the top tercile is about 50 percent and 70 percent more than that for the middle and bottom income groups, respectively, and similarly elderly group aggregate deficit for the top tercile is about 3 times and 5 times that for the middle and bottom income groups, respectively; (2) the ratio of aggregate surplus to aggregate deficit increases from 0.07 for bottom to 0.22 and 0.41 for the middle and top terciles, respectively; and (3) share of aggregate deficit accounted for by the elderly increases from 0.2 percent for bottom to 8 and 14 percent for the middle and top terciles, respectively.

The shares of aggregate consumption accounted for by the different age group also differ across income groups. The young deficit age group in the bottom tercile accounts for 66 percent of aggregate consumption and the shares are lower at 57 and 42 percent for the middle and top terciles, respectively. In contrast, the elderly deficit age group in the bottom and middle terciles account for 8 and 9 percent of aggregate consumption and the share is higher at 11 percent for the top tercile.

The young deficit age group accounts for a lower share of labor income at 19 percent for the bottom tercile compared to 31 and 27 percent for the middle and top terciles. The elderly deficit age group accounts for near equal shares of labor income in the three income groups.

4. Comparing consumption and labor income age profiles across income groups

Comparisons of age profiles across income tercile groups are done in two aspects: the overall levels of the age profiles; and the patterns across age. Differences in overall levels have been discussed partly in Section 3 in aggregate terms based on Table 1.

Differences in age distribution of aggregate consumption and labor income have also been covered in Section 3 in broad age grouping based on Table 2.

The overall levels of age profiles, or the first aspect of age profiles, are examined further in terms of the income tercile groups' per capita means and the distributions of aggregate totals across income groups (Section 4.1). The distributions are additionally used to compute for an index of inequality in consumption and labor income across income groups. The patterns across age, or the second aspect of age profiles, are examined further in single ages using the raw and standardized per capita age profiles of each specific component of labor income and consumption (Sections 4.3 to 4.6). The distribution of each income tercile group's population by age is also presented to complete the comparisons (Section 4.2).

Standardized per capita mean age profiles are derived by dividing the raw per capita mean at each age by the mean of the reference age group. Except for the education consumption components, the reference is the age group 35-39 years old. For education consumption the reference is the age group 13-16 years (the usual ages attending secondary school in the Philippines.) The standardized age profiles show purely the age patterns without the confounding effect of the differences in the scale or overall levels of consumption and labor income across the income groups.

4.1 Per capita means and distribution of aggregate totals by income tercile group

The income tercile group per capita means in Table 3 and the distribution of aggregate totals in Table 4 are based on Table 1.

Per capita means by income group

Table 3. Consumption and labor income per capita mean by income tercile group and national: Philippines, 2007, current prices, (in PhP)

	Per capita mean by income tercile group			National per
NTA component	Bottom	Middle	Top	capita mean
Consumption	27,108	46,461	104,147	54,224
Public	7,614	7,551	7,017	7,432
Education	1,922	1,819	1,287	1,717
Health	474	515	512	498
Other	5,218	5,218	5,218	5,218
Private	19,494	38,909	97,130	46,792
Education	514	1,393	7,071	2,570
Health	375	1,023	4,546	1,712
Other	18,605	36,494	85,512	42,510
Labor Income	14,145	31,172	80,805	37,700

Table 3 shows there is least difference in the per capita means for public consumption components with the ratio of the income tercile group means relative to the national means ranging from 1.12 (bottom) to 0.75 (top) and from 0.95 (bottom) to 1.03 (top) for public education and health consumption, respectively. The range of the corresponding ratios of tercile group means to national mean is wider for private

consumption components from 0.20 (bottom) to 2.75 (top) and from 0.22 (bottom) to 2.66 (top) for private education and health consumption, respectively. The range of the corresponding ratios of tercile group means to national mean for labor income is similarly wide as that for private consumption.

Distribution of aggregate totals by income group

Table 4. Distribution of aggregate consumption, aggregate labor income and population by income tercile group (in percent) and concentration index: Philippines, 2007

NTA component	Aggregate (in billion PhP)	Income tercile group				Concentration index
		Total	Bottom	Middle	Top	
Population (88B)	-	100	40.2	32.8	27.0	-
Consumption	4,770	100	20.1	28.1	51.8	0.295
Public	654	100	41.2	33.3	25.4	-0.016
Education	151	100	45.0	34.8	20.2	-0.021
Health	44	100	38.3	34.0	27.7	0.018
Other	459	100	40.2	32.8	27.0	0.000
Private	4,116	100	16.8	27.3	56.0	0.345
Education	226	100	8.0	17.8	74.2	0.562
Health	151	100	8.8	19.6	71.6	0.496
Other	3,739	100	17.6	28.2	54.2	0.328
Labor Income	3,316	100	15.1	27.1	57.8	0.368

The distributions of the aggregate consumption and labor income components by income group (Table 4) show patterns that reflect the findings on per capita means by income group: least difference in income group shares for public consumption components; and greatest differences in shares for private consumption components and labor income.

For concrete quantification of the extent of disparity or inequality in the shares of the income tercile groups the concentration index is computed for the different consumption components and for labor income.[3] The concentration index reported in Table 4 show the extent to which the aggregate, such as aggregate labor income, is concentrated in specific income groups as follows: positive value indicates concentration in the upper income group; and negative value indicates concentration in the lower income group. As expected, the concentration indexes for public consumption components are generally low and close to zero. The computed index for public education consumption is even negative indicating concentration towards the low income group.[4] The computed indexes are high and positive for private consumption

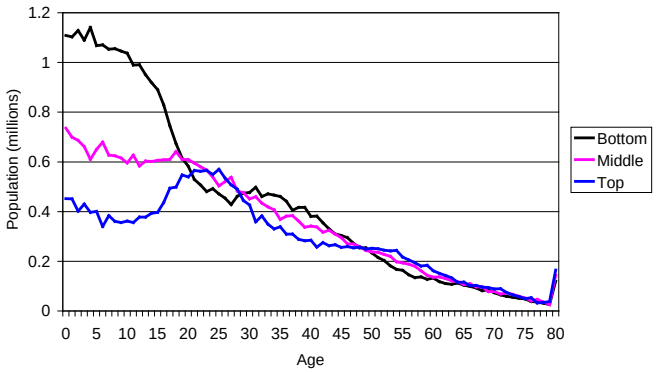
[3] For more detail on the concentration index see O'Donnel et. al. (2008). The reference for the concentration index computations in Table 4 is the distribution of the population by income tercile group. The range of values for the concentration index is [-1.0,1.0] where values approaching 1.0 means high concentration in the upper income group, a value of zero means equal distribution among income groups, values near zero (negative or positive) means low concentration, and values approaching -1.0 means high concentration in the lower income group.

[4] This result is consistent with the findings of Manasan, Cuenca and Ruiz (2008). They found government education expenditures to be regressive.

components, with the highest inequality in private education consumption. The concentration index is also relatively high and positive for labor income.

4.2 Age distribution of population by income tercile group

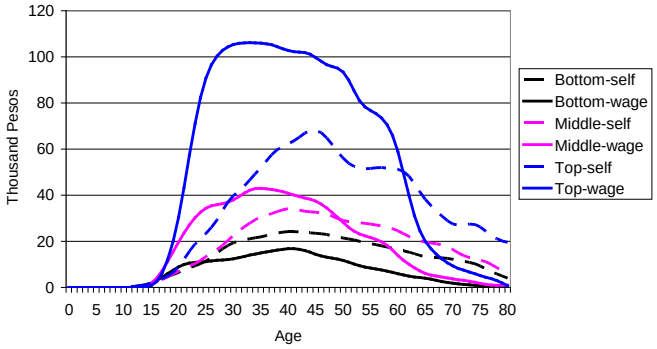
Figure 4. Population by age and by income tercile group, Philippines, 2007 (in millions)



The age distributions of the population of each income tercile group are very different up to about age 20 years and somewhat similar thereafter. For the young population in the bottom income tercile group, the most numerous are in ages 5-16 years old, at about 800 thousand or more at each age. In contrast, for the top income tercile group the most numerous are in the ages 17-20 years old, at around 500 thousand or more at each age. For the middle income tercile group there are near equal numbers at each age 0 to 20 years, ranging from 550 to 650 thousand at each age.

4.3 Age profiles of labor income

Figure 5. Age profile of per capita labor income by component and by income tercile group, Philippines, 2007, current prices (in PhP thousands)



Per capita age profiles for earnings and self-employment income are shown in Figure 5 for all income tercile groups. Except for the bottom tercile, per capita earnings exceed per capita self-employment income at younger ages and then the pattern reverses at older ages in both the middle and top income terciles. In the bottom income tercile per capita earnings is lower than self-employment income at nearly all ages.

Figure 6. Standardized age profile of per capita labor income/earnings component by income tercile group (relative to per capita of age group 35-39 of each income group), Philippines, 2007

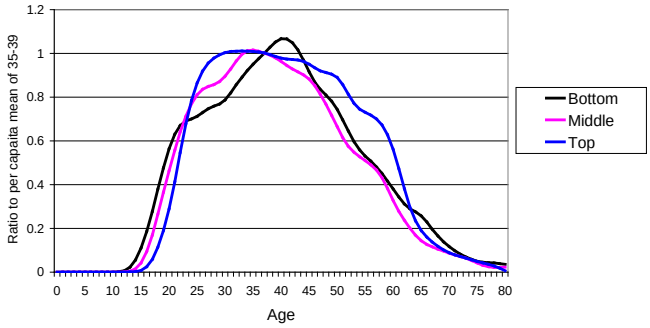
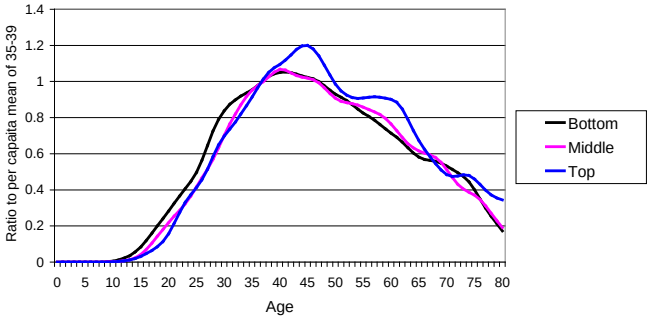


Figure 7. Standardized age profile of per capita self-employment labor income by income tercile group (relative to per capita of age group 35-39 of each income group), Philippines, 2007



The standardized per capita age profiles for earnings (Figure 6) and self-employment income (Figure 7) show that overall patterns by age for earnings and self-employment income are generally similar across all income groups but with a few observable differences. Per capita earnings peaks at an earlier age, about 32 years, for the top tercile compared to the middle and bottom terciles with peaks at ages 35 years and 40 years, respectively (Figure 6). Per capita self-employment income, on the other hand, peaks earlier for the bottom and middle terciles at ages 41 and 40 years, respectively, compared to age 45 years for the top tercile (Figure 7).

As reflected in the per capita age profiles of each income group, self-employment income accounts for a bigger share (more than half) of total aggregate labor income for the bottom tercile and smaller share (less than half) for the middle and top terciles (Table 5.)

Table 5. Distribution of aggregate labor income by source for income tercile groups, Philippines 2007(in percent)

Income source	All income groups	Income tercile group		
		Bottom	Middle	Top
Earnings	60	40	58	66
Self-employment	40	60	42	34
Total	100	100	100	100

The combined per capita labor income age profiles by income group have already been presented in Figure 1. As noted previously, the ages when total labor income peaks are 41, 39 and 44 years for the bottom, middle and top income terciles, respectively. These ages are generally closer to the ages when self-employment income also peaks.

4.4 Age profiles of education consumption

Figure 8. Age profile of per capita public education consumption by income tercile group, Philippines, 2007, current prices (in PhP)

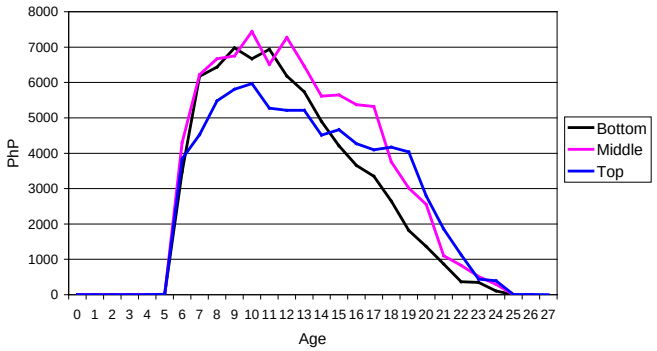
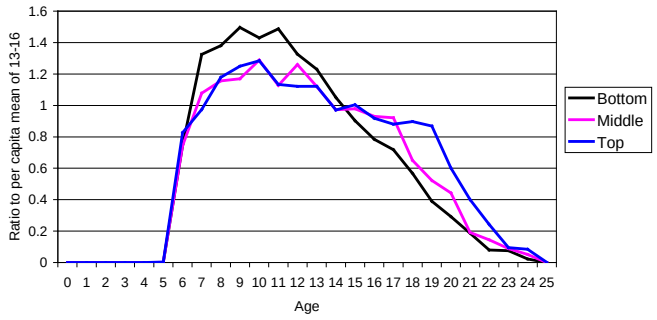


Figure 9. Standardized age profile of per capita public education consumption by income tercile group (relative to per capita of age group 13-16 of each income group), Philippines, 2007



Per capita means by age for public education consumption have the same overall pattern for the different income groups, with per capita values highest in ages 6 to 12 years (Figures 8 and 9). Note that there is not much difference between the raw and the standardized age profiles because the same scale factor (the national per capita mean) was used for all income groups' per capita age profiles. The age patterns in Figures 8 and 9 are reflective of the enrollment rates by age and by income group (see Figures A.1.4, A.1.5 and A.1.6) that were used to estimate the per capita public education age profiles.

Figure 10.Age profile of per capita private education consumption by income tercile group, Philippines, 2007, current prices (in PhP)

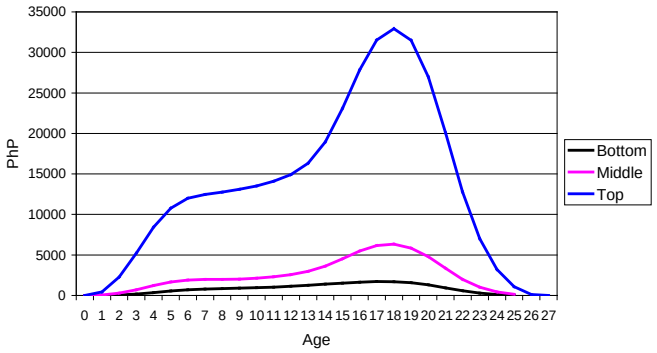
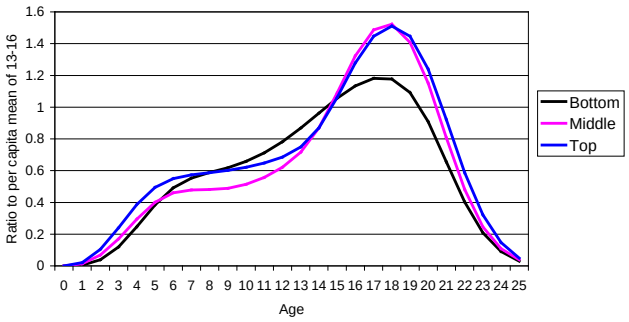


Figure 11. Standardized age profile of per capita private education consumption by income tercile group (relative to per capita of age group 13-16 of each income group), Philippines, 2007



The per capita means by age in Figure 10 show distinct difference in level or scale of consumption at each age for the different income groups. Removing the effect of scale, the patterns of per capita means of private education consumption by age is very similar across income groups, with per capita values relatively higher for the ages 13 to 21 years (Figure 11). The age patterns in Figure 10 and 11 reflect the allocation weights by age and by income group (Figure A1.1) that were used to estimate the per capita age profiles.

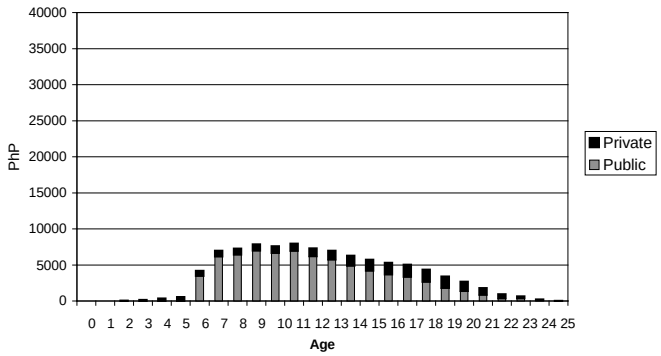
Table 6. Public-private distribution of aggregate education consumption by income tercile group, Philippines 2007(in percent)

Type of consumption	All income groups	Income tercile group		
		Bottom	Middle	Top
Public	40	79	57	15
Private	60	21	43	85
Total	100	100	100	100

Putting the two types of education consumption together, public expenditures mostly cover elementary education (ages 6-12 years) and private expenditures cover mostly higher education (ages 17-24 years). The difference in the pattern of per capita education expenditures by age between public and private sources, however, have

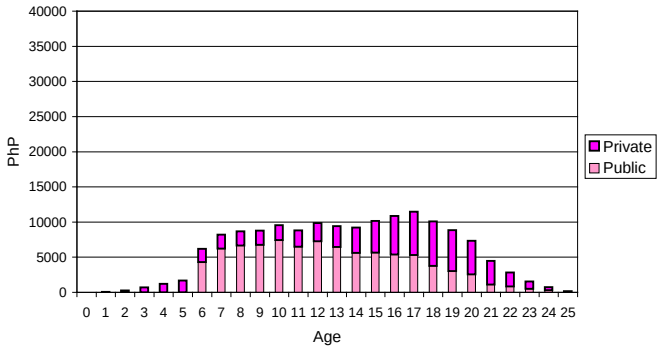
varying effects on the overall per capita mean education expenditures by age of the different income tercile groups (Figures 12, 13 and 14). The variation is due to the difference in the scale at which public education expenditures are topped-off by private expenditures. Private expenditures is only 21 percent of the total education consumption of the bottom tercile compared to 43 percent and 85 percent for the middle and top terciles, respectively (Table 6).

Figure 12. Age profile of per capita private and public education consumption for the bottom income tercile group, Philippines 2007, current prices (in PhP)



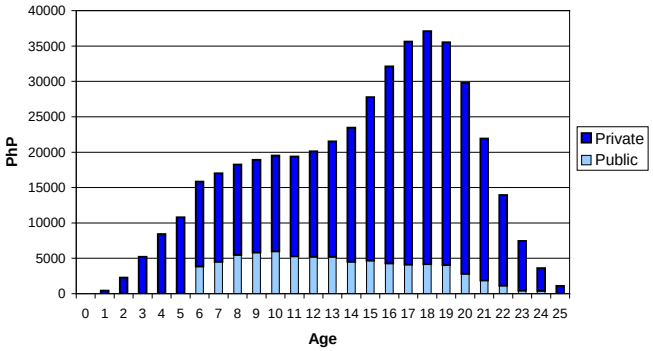
For the bottom tercile, the topping off with private spending is generally low compared to public spending at each age. Thus, the age profile for the combined per capita education expenditures follows closely the profile of public expenditures.

Figure 13. Age profile of per capita private and public education consumption for the middle income tercile group, Philippines 2007, current prices (in PhP)



For the middle tercile, the topping-off with private expenditures goes mostly towards high school and tertiary education, making the per capita spending nearly equal or at the same level from age 7 to 19 years.

Figure 14. Age profile of per capita private and public education consumption for the top income tercile group, Philippines 2007, current prices (in PhP)



For the top tecile, there is significant topping-off with private expenditure at all ages (exceeding public expenditures) with ages 15 to 20 years showing the highest additions. Private education expenditures also cover the schooling of children under 6 years old.

4.5 Age profiles of health consumption

Figure 15. Age profile of per capita public health consumption by income tercile group, Philippines, 2007, current prices (in PhP thousands)

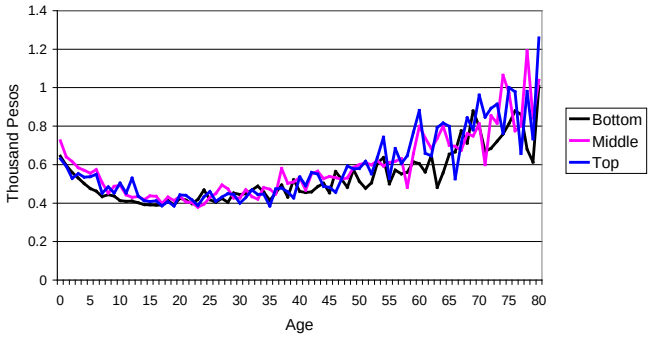
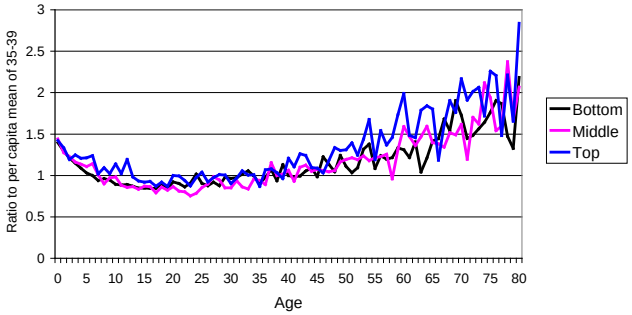


Figure 16. Standardized age profile of per capita public health consumption by income tercile group (relative to per capita of age group 35-39 of each income group), Philippines, 2007



Per capita means by age of the public component of health consumption have the same general pattern for the different income groups: higher per capita values for the

young ages under 5 years and at older ages starting 50 years (Figures 15 and 16). This observed pattern by age, as with public education consumption, reflect the public health facility utilization rates by age (se Figures A1.7 to A1.8) that were used to estimate the per capita public health expenditures age profiles.

Figure 17. Age profile of per capita private health consumption by income tercile group, Philippines, 2007, current prices (in PhP thousands)

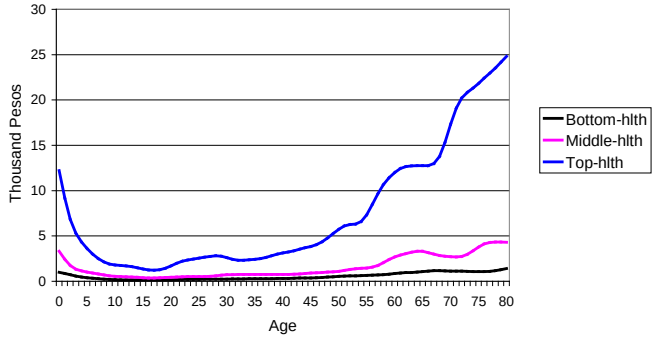
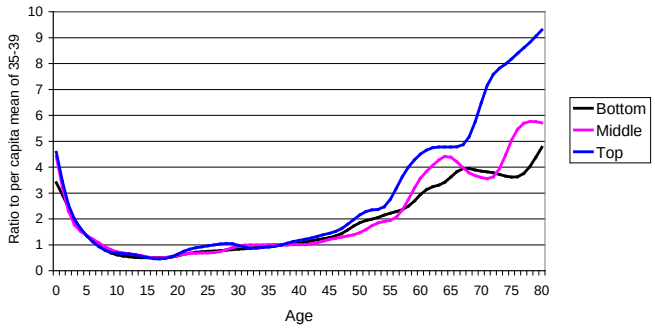


Figure 18. Standardized age profile of per capita private health consumption by income tercile group (relative to per capita of age group 35-39 of each income group), Philippines, 2007



The per capita mean age profiles for private health consumption shown in Figure 17 for the three income groups show more distinctly the expected shape, specifically the higher per capita means for the young and the older ages. The pattern by age reflects the hospital utilization rates and morbidity rates used as age allocation weights to estimate the per capita age profiles (see Figures A1.2 and A1.3). While the patterns across age are generally similar, the standardized per capita age profiles in Figure 18 indicate some difference between income groups. The per capita mean for the very young, age 1 year, is over 4 times the mean of the reference group for the middle and top terciles but about 3 times for the bottom tercile. And the per capita mean for those age 70 years or older is 7 to 9 times the mean of the reference group for the top tercile but only about 3 to 5 times for the bottom and middle terciles.

Figure 19. Age profile of per capita public and private health consumption for the bottom income tercile group, Philippines, 2007, current prices (in PhP thousands)

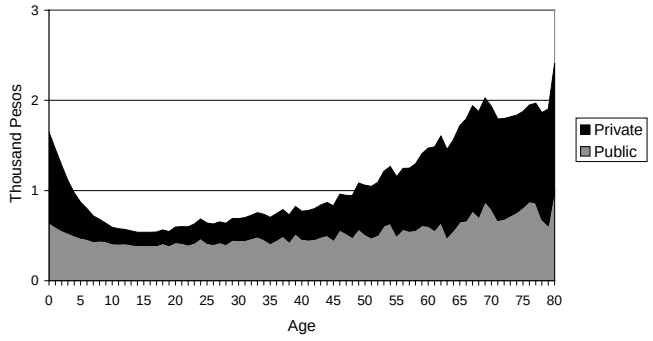


Figure 20. Age profile of per capita public and private health consumption for the middle income tercile group, Philippines, 2007, current prices (in PhP thousands)

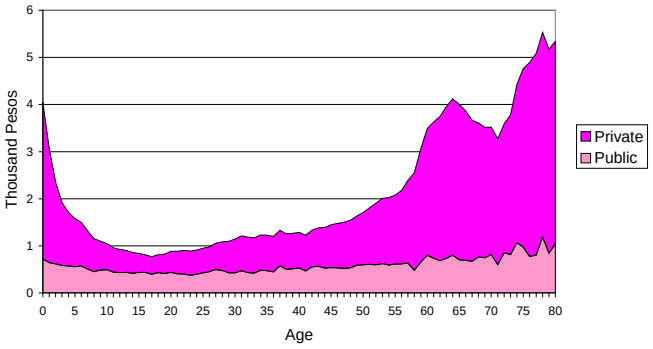
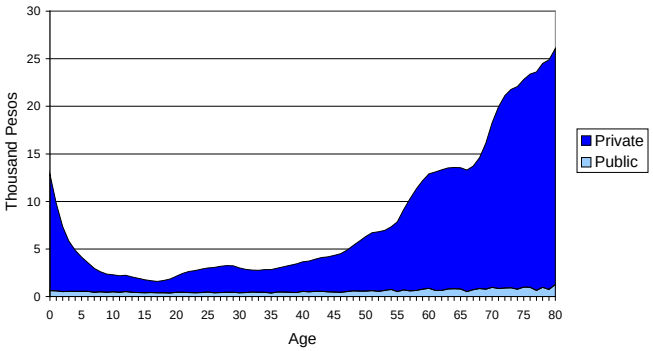


Figure 21. Age profile of per capita public and private health consumption for the top income tercile group, Philippines, 2007, current prices (in PhP thousands)



Combining public and private health consumption produces per capita age profiles whose shapes are driven mainly by the age profile of private health consumption in all income groups (Figures 19, 20 and 21). The reason for this result is that private expenditures for health accounts for large shares in all income groups, even as much as 44 percent of total health consumption for the bottom income tercile and much higher shares for the other income groups (Table 7).

Table 7. Public-private distribution of aggregate health consumption by income tercile group, Philippines 2007(in percent)

Item description	All income groups	Income tercile group		
		Bottom	Middle	Top
Public	23	56	33	10
Private	77	44	67	90
Total	100	100	100	100

The increasing shares accounted for by private health consumption moving from the bottom tercile to the top tercile leads to per capita mean for total health consumption at each age that are also increasingly higher for the middle and top terciles. Wider differences in per capita means between the income groups are found in the age groups that are "expensive" health-wise, the young and the elderly. For example, for age 25 years the per capita mean is about PhP650 for the bottom tercile versus PhP2,500 for the top tercile group. In contrast, for age 1 year the per capita mean is about PhP1,500 for the bottom tercile versus PhP9,800 for the top tercile. For age 70 years, the per capita mean is PhP1,900 for the bottom tercile versus PhP17,800 for the top tercile.

4.6 Age profiles of other consumption

Public other consumption is assumed to benefit the entire country's population equally. Thus, the per capita mean is the same across ages and across all persons in the different income groups. This may be noted in Table 3 which shows income tercile group means to be the same.

Private other consumption is assumed to accrue to different ages based on a fixed allocation rule (Racelis and Salas 2007). Thus, per capita means by age have the same overall age profile for the different income groups (Figures 22 and 23). The age profiles in Figure 22 are different only in the scale or level indicated previously in Table 3.

Figure 22. Age profile of per capita private other consumption by income tercile group, Philippines, 2007, current prices (in PhP thousands)

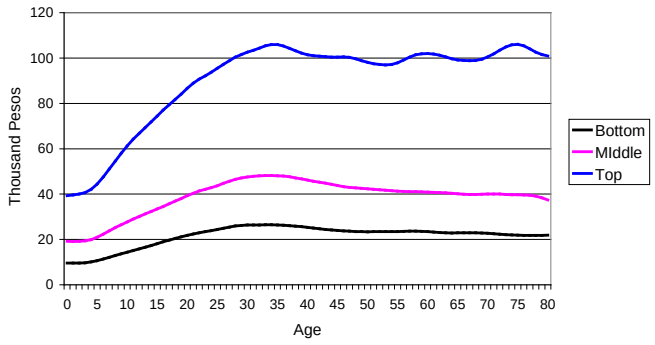
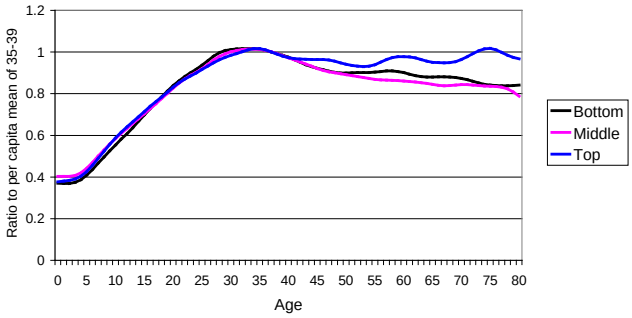


Figure 23. Standardized age profile of per capita private other consumption by income tercile group (relative to per capita of age group 35-39 of each income group), Philippines, 2007



The public share of total other consumption is generally low for all income groups (Table 8). The shares are 22 percent for the bottom tercile and 6 percent for the top tercile.

Table 8. Public-private distribution of aggregate other consumption by income tercile group, Philippines 2007(in percent)

Item description	All income groups	Income tercile group		
		Bottom	Middle	Top
Public	11	22	13	6
Private	89	78	87	94
Total	100	100	100	100

Given the low public share and constant per capita mean, the per capita age profiles for total other consumption is then shaped mainly by the age profile of private other consumption for all income groups.

5. Summary and conclusion

Per capita age profiles of consumption and labor income, when the effect of scale is removed (i.e. standardized age profiles), are generally similar in shape across income groups. The main difference in the raw age profiles is the scale or level at each age. While the difference in scale between income groups is very low for public consumption, it is very wide for private consumption; and, because consumption is predominantly private, there is wide difference in scale in total consumption between income groups. The difference in the scale of private consumption is a reflection of the difference in the scale of labor income between income groups.

Findings from the consumption and labor income age profiles by income group include: (1) per capita age profiles for consumption and labor income have the expected shapes for all income groups; (2) there is progressively lower per capita values for consumption and labor income at all ages going from top, middle to the bottom income

tercile group; (3) per capita labor income peaks at a later age in the top compared to the middle and bottom income groups.

Other findings about the economic lifecycle behavior by income group include: (1) the young incur lifecycle deficit longer in the bottom tercile (age 30 years) compared to the middle and top terciles (ages 26 and 24 years, respectively); (2) the elderly incur lifecycle deficit earlier in the bottom tercile (age 53 years) compared to the middle and top terciles (ages 56 and 59 years, respectively); (3) the spans of the surplus ages are shorter for the bottom and middle terciles (22 and 29 years, respectively) compared to that for the top tercile (34 years) ; (4) the young deficit age groups account for 66, 57 and 42 percent of aggregate consumption in the bottom, middle and top income groups, respectively; (5) the elderly deficit age groups account for 8, 9 and 11 percent of aggregate consumption in the bottom, middle and top income groups, respectively; and (6) the ratio of the surplus generated by the working age group to the total lifecycle deficits of the dependent populations were computed to be 9, 22 and 41 percent for the bottom, middle and top income groups, respectively.

There are more aspects of the age profiles and the economic lifecycle behavior of the different income groups that can be studied further. These include among others: (1) analysis of the difference in the scale of consumption across income groups within age groups to identify age-specific inequality; (2) study on the implications of the different deficit age cut-offs of income groups on program targeting; and (3) study on transfer of resources between income groups to finance lifecycle deficit. These further studies may require other data in addition to the NTA results.

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Appendix A

Methods for estimating age profiles by income group in the 2007 Philippines NTA

Consumption expenditure is defined in NTA to compose of private consumption and public consumption. And each consumption component in turn consists of education, health and other consumption. Labor income is defined to compose of salaries and wages or earnings, and self-employment income.

Private consumption and labor income age profiles

Per capita means of private consumption and labor income components (e.g., private household education expenditure, private household health expenditure, salaries and wages, etc.) by age in single years are calculated from household survey data either directly from individual level data or indirectly from household level data using some allocation rule applied at the household level. Salaries and wages are reported in the APIS at the individual worker level; and, thus, the per capita mean value at each age can directly be computed from the raw survey data by simply taking the total salaries and wages at each age and dividing the total by the number of respondents at each age.

In contrast, expenditures and self-employment income data in the FIES and APIS are reported only at the household level. In general the method for allocating components reported at the household level to the different ages is carried out at the household level. The household total is distributed among its household members and the share of an individual household member is computed using age-specific weights as follows:

$$X_i = X\left(w_i \Big/ \sum w_i\right)$$

where
X = total value (at household level) of component to be allocated to members
X_i = share of household member of age i
w_i = (allocation) weight for a household member of age i
$\sum w_i$ = sum of weights across all members of the household
i = age of household member

Then the per capita age profile is computed using the amount (X_i) allocated or assigned to each individual respondent by taking the total of X_i's at each age and dividing the total by the number of respondents at each age. Thus, the shapes of the consumption age profiles in particular are the results of rules or profiles of related variables used to allocate the component to the different ages.

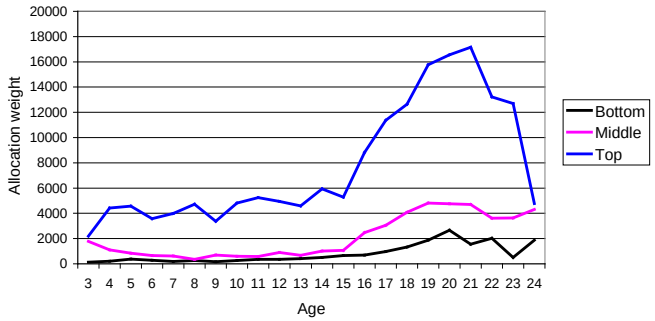
For the computation of the age profiles by income group, the same overall procedure for assigning shares to household members is followed but different sets of weights are used for each income group.

The mean per capita age profile of salaries and wages for each income group is calculated directly from APIS by simply grouping the individual person sample by income group

and then computing for the per capita mean earnings by age separately for each income group. Unlike salaries/wages, entrepreneurial or self-employment income as already mentioned previously is reported in the APIS at the household level. Self-employment income is assigned to household members engaged in own-account work (identified based on the class of worker information on household members) using the per capita salaries/wages by age specific to the income group as allocation weights.

Private household education expenditure is reported in the APIS at the household level only and allocation to household members is done indirectly. One regression equation is estimated for each income group: household education expenditure regressed (without intercept) on the number of enrolled household members in single ages who are of ages 3 to 24 years. Then for households in each income group, education expenditure is distributed to household members ages 3 to 24 years who are attending school using the regression coefficients specific to the income group as allocation weights (Figure A1.1). The regression coefficients depicted in Figure A1.1 were estimated using the 2007 APIS.

Figure A1.1. Private household education expenditures allocation weights by age and by income tercile group, Philippines, 2007



Private household health expenditure is similarly reported in the APIS at the household level only and allocation to household members is also done indirectly. Two types of health expenditures are distinguished, hospital and non-hospital; and allocation weights for each type are computed by income group. For households in each income group, hospital expenditures are allocated to the different ages using age-specific hospital utilization rates of the income group as allocation weights (Figure A1.2). The hospital utilization rates were computed from the 2007 APIS.

Figure A1.2. Private household hospital health expenditures allocation weights by age and by income tercile group, Philippines, 2007

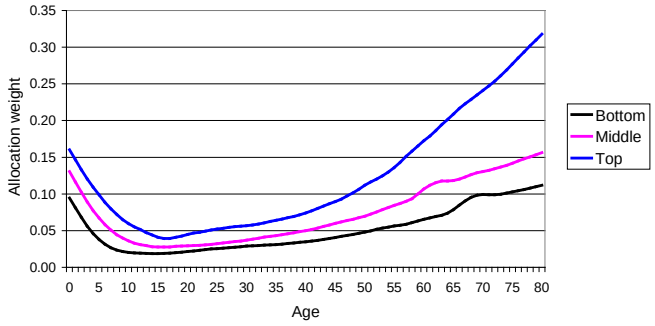
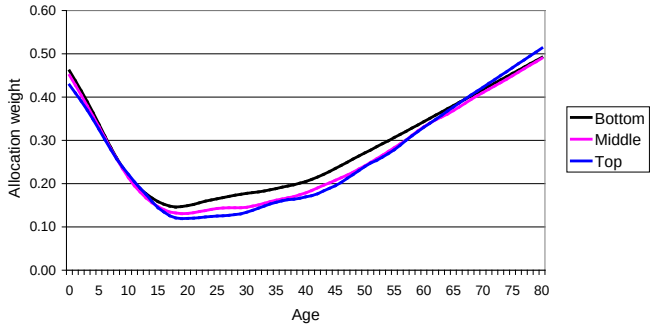


Figure A1.3. Private household non-hospital health expenditures allocation weights by age and by income tercile group, Philippines, 2007



Non-hospital health expenditures are similarly allocated to the different ages using as allocation weights a combined proportion computed by age and by income group – the proportion at each age who had reported being ill and/or had used a non-hospital health facility (Figure A1.3). The proportions were computed from the 2007 APIS.

Public consumption age profiles

Per capita age profiles for public consumption, on the other hand, are estimated starting with macro-level or total country level expenditure data together with data on number of users of public services. First, the national per capita mean expenditure is computed and assumed to apply to all beneficiaries or it is assumed that all users of government services from the different income groups benefit equally. Second, the national per capita mean is multiplied with the number of users at each age for the different income groups, e.g. number of students enrolled in public schools by age in the bottom tercile (where data on utilization rate by age and by income group are obtained from surveys) and this provides the total or aggregate expenditures for each age group by income group, e.g. total public education expenditures allocated to each age group in the bottom tercile. Computation for is done as follows:

$$X(i,T) = U(i,T)\overline{X}$$

where
X(i,T) = aggregate expenditure for age i of income tercile group T
U(i,T) = number of users of age i belonging to income tercile group T
$\overline{X}$ = national per capita mean expenditures
i = age of individual
T = income tercile group (1 for bottom, 2 for middle and 3 for top)

Next, for each income group the per capita values (not per user or per consumer) are computed by dividing the computed aggregate expenditure by the corresponding population size of the same age and income group as follows (also shown is a rearrangement of terms):

$$x(i,T) = \frac{X(i,T)}{P(i,T)} = \frac{U(i,T)\overline{X}}{P(i,T)} = \left(\frac{U(i,T)}{P(i,T)}\right)\overline{X} = u(i,T)\overline{X}$$

where
x(i,T) = per capita mean expenditure for age i of income tercile T
X(i,T) = aggregate expenditure for age i of income tercile T
P(i,T) = population size of age i belonging to income tercile T
U(i,T) = number of users of age i belonging to income tercile T
$\overline{X}$ = national per capita mean expenditures
u(i,T) = utilization rate for population of age i belonging to income tercile T
i = age of individual
T = income tercile group (1 for bottom, 2 for middle and 3 for top)

Thus, the formulation above shows that the per capita mean expenditure age profile of each tercile is in fact the age profile of the income group specific utilization rates scaled up by the national per capita mean.

Public education expenditures are divided for age allocation purposes by schooling level: elementary, high school and college (or higher). Expenditures at each level of schooling is allocated to the different ages according to the number of users of the schooling level by age and by income group. The utilization rates or the enrollment rates by age (used in the age allocation) for public elementary, high school and tertiary education of the population aged 5 to 24 years are shown in Figures A1.4, A1.5, and A1.6. The enrollment rates were computed from the 1999 APIS which is the most recent household survey that reported school enrollment by type of school.

Figure A1.4. Public elementary school enrollment rate by age and by income tercile group (in percent), Philippines, 2007

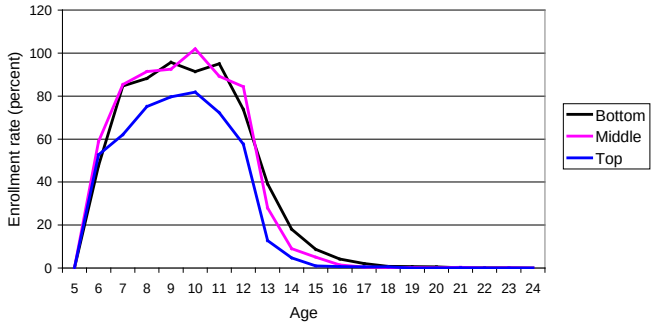


Figure A1.5. Public high school enrollment rate by age and by income tercile group (in percent), Philippines, 2007

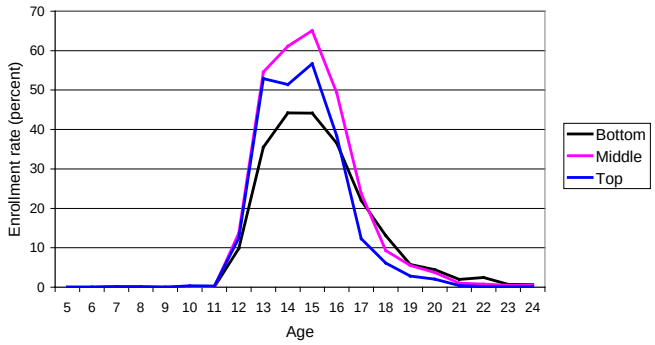
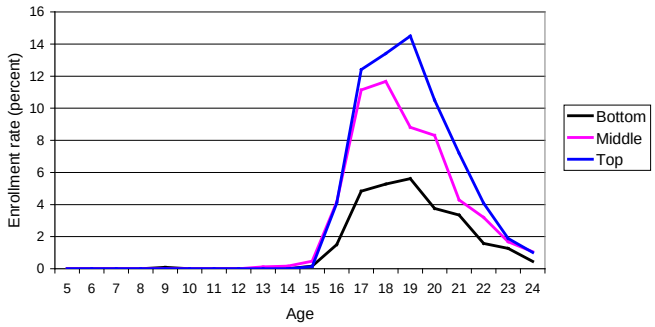


Figure A1.6. Public tertiary education enrollment rate by age and by income tercile group (in percent), Philippines, 2007



Public health expenditures are divided for age allocation purposes into hospital and non-hospital expenditures. Hospital expenditures are allocated to the different ages based on the number of public hospital users by age and by income group. Non-hospital expenditures are allocated to the different ages according to the number of users of rural health units, health centers and barangay health stations by age and by income group. The utilization rates by age (used in the age allocation) for public hospitals and for primary health care facilities are shown in Figures A1.7 and A1.8. These health facilities utilization rates were computed from the 2007 APIS.

Figure A1.7. Public hospital utilization rates by age and by income tercile group (in percent), Philippines, 2007

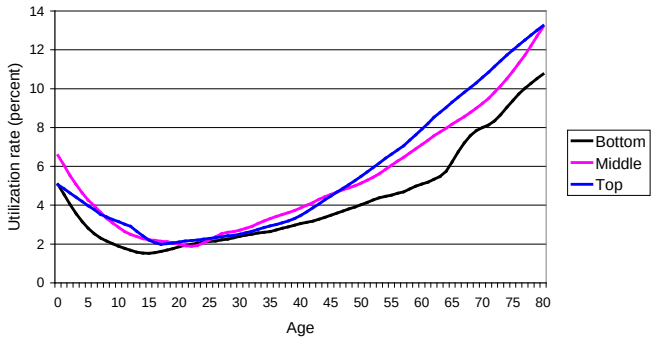
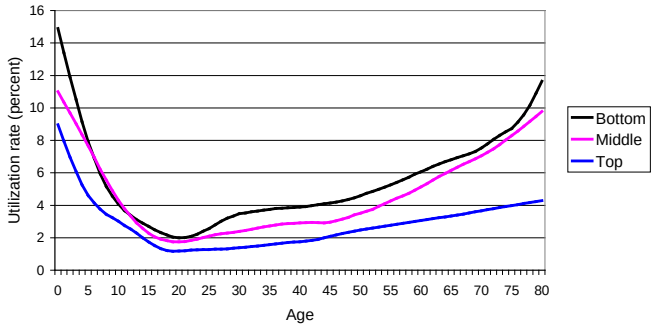


Figure A1.8. Public primary health care facilities utilization rates by age and by income tercile group (in percent), Philippines, 2007



Aggregate control totals by income group

The national aggregate control totals for the 2007 Philippines NTA for each specific component of consumption and labor income are presented in Abrigo, Racelis and Salas (2012). For components of private consumption (education, health and other) and labor income (earnings and self-employment income) aggregate control totals by income group were computed by applying the percentage distribution of these components by income group (which were tabulated from the 2007 APIS) to the national aggregate control totals. (The percentage distributions are the same as those shown in Table 4.) The aggregate controls for each income group were used to adjust the per capita age profiles for private consumption and labor income components upwards or downwards to ensure that the sum of aggregate consumption and aggregate labor income across all income groups would be consistent with the national aggregate control totals. Note that the totals for aggregate consumption and labor income shown in Table 4 are equal to the national aggregate control totals.

For public consumption components (education health and other) the aggregate control totals at the national level served as the reference for age profiles estimates for all income groups. As described previously, the national per capita means for the different components are assumed to apply to all income groups. The per capita age profiles by income group differ only because of differences in the age-specific utilization rates for public education and health services. Utilization rate for "other" public services is assumed to be the same across all ages and income groups; hence, the constant per capita mean by age and across income groups.