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Who Wins and Who Loses from PhilHealth? Cost and Benefit Incidence of Social Health Insurance in a Lifecycle Perspective

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Cost and Benefit Incidence of Social Health Insurance in a Lifecycle Perspective

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Abstract

We use incidence analysis to examine the financial costs and benefits from the Philippine's National Health Insurance Program (NHIP) through the Philippine Health Insurance Corporation (PhilHealth) that accrue to different age groups and socio-economic classes. We find that premium contributions to and benefits payment by PhilHealth are both pro-poor. As a public transfers program, PhilHealth reallocates resources from higher to lower income population. As a pseudo-pension program, it transfers resources from workers to finance health care of retirees. As a health insurance, its premium contributions are not actuarially fair given the benefits it provides. Over the course of an average Filipino's lifetime, the NHIP is estimated to lose about 40 centavos for every peso an individual contributes directly or indirectly as premium to PhilHealth.

Keywords: Social health insurance, Benefit incidence analysis, Cost incidence analysis, National Transfer Account, Philippines

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Who wins and who loses from PhilHealth? Cost and benefit incidence of social health insurance in a lifecycle perspective

Michael R.M. Abrigo[1]

1. Introduction

Governments play important roles in the reallocation of resources across different populations and through time with the governments' exclusive authority to levy taxes and their ability to provide goods and services using taxes and other income. These government actions often – inadvertently or purposively – result in winners and losers (e.g., Neary, 1994; Dinan and Rogers, 2002; Birdsall and Nellis, 2003; Paqueo, et. al., 2017). Balancing competing claims on government-held resources are therefore often fraught with contention. Government programs are often ultimately justified based on its ability to improve some measure of social welfare.

Public spending has been known to increase as economies develop, potentially as a result of expanding fiscal space (Peacock and Wiseman, 1961; Fan and Savedoff, 2014). Indeed, with the turn of the millennium, many developing countries have made significant steps to introduce or reform different government entitlements, particularly with regard to health care financing (Wagstaff, 2010) and old-age pension (Holzmann, 2013).

The Philippines is riding on a similar wave of reforms that are fueled by the country's recent strong economic performance. Over the last decade, the government has introduced new entitlements, including free tertiary education, and free health insurance for the poor and the elderly, while expanding existing programs, such as social health insurance in the informal sector. Parallel reforms on taxation have been instituted in part to finance these new and expanding entitlements. With the free tertiary education and the free health insurance programs alone, close to PhP110 billion have been allocated in 2019, or roughly 3 percent of the total government budget in that year.

These reforms come at a crucial phase in the country's demographic transition. While the country remains a young population, it is projected to transition into an ageing society in the next decade, and into an aged population in about one generation after (Abrigo, et. al., 2020). While the demographic transition, in general, and population ageing, in particular, provide opportunities for growth (e.g. Mason, 2006; Mason and Lee, 2007), the existing age schedule of taxes and entitlements in the country is expected to either negatively affect the government's ability to provide for goods and services in the longer term, or introduce greater fiscal burden on future generations (Abrigo, et. al., 2020; Abrigo, 2019).

Several attempts have been made to document the incidence of benefits and costs of existing and proposed government policies in the country, including on health (e.g., Manasan and Cuenca, 2010; O'Donnell, et. al., 2008), education (e.g., Manasan, et. al., 2008; Orbeta and Paqueo, 2017), and taxation (e.g. Shah and Whalley, 1991; Devarajan and Hossain, 1998; Manasan, 2018). By and large, these previous analyses suggest that Philippine government spending on public health is progressive, while that for curative care is regressive; public spending on basic education is progressive, while that for higher education is regressive; and

[1] Fellow II at the Philippine Institute for Development Studies. The author is grateful for insightful comments by participants in the PIDS Research Workshop series where a preliminary version of the report was presented. All remaining errors are by the authors.

that taxation is regressive, neutral, or progressive depending on type. These broadly follow the patterns observed in other countries (e.g. Asante, et. al., 2016; O'Donnell, et. al., 2008; Davoodi, et. al., 2010; Shah and Whalley, 1991; Kakwani, 1977).

This paper attempts to build on these previous studies to assess the incidence of costs and benefits of fiscal reforms in the Philippines with the National Health Insurance Program (NHIP) as a specific focus. Unlike in earlier analyses that focus on measuring incidence of financial flows to and from different subpopulations based on only one dimension,[2] i.e., cross-sectionally using socio-economic status (e.g. Asante, et. al., 2016; O'Donnell, et. al., 2008) or temporally using cohorts (e.g. Bommier, et. al., 2010; Cutler and Sheiner, 2000), we provide estimates of lifecycle incidence of costs and benefits by educational attainment as proxy for socio-economic class. This allows us to compare the lifetime net benefits or costs to individuals across socio-economic groups.

We find that premium contributions to and benefits payment by the Philippine Health Insurance Corporation (PhilHealth), which administers the country's NHIP, are both pro-poor. However, premium contributions are found to be regressive, i.e., with higher tax rates levied among lower income households, although benefits payments are progressive, i.e., with higher per capita benefits accruing to poorer households. As a whole, the NHIP is a progressive public reallocations system that benefits lower income households more.

We also document imbalances in the levels of PhilHealth contribution and utilization across the lifecycle and among socio-economic groups. On average, individuals are net contributors to the system for only about two decades, i.e., from early teens to mid-30s, and net beneficiaries for a large portion of their life, starting in their late 50s. When disaggregated by socio-economic class, individuals from lower socio-economic class transition earlier into net beneficiary status, and receive higher net benefit levels over the course of their lifetime. Among those with no grade completed, survival-weighted benefit-cost (B/C) ratios at age 90 may reach as high as 3.4, while substantial B/C ratios may also be observed for other lower socio-economic groups, including those who reached primary (B/C ratio = 2.4) and secondary (1.8) education levels. College-educated individuals, on the other hand, remain net contributors to PhilHealth and the NHIP throughout their lifetime.

When aggregated over the population, we show that these imbalances across age and socio-economic groups will exert substantial financial pressure on the country's NHIP in the longer term. While higher income individuals are projected to generate surpluses over their lifetime, these may not be enough to cover the projected deficits that the system will incur from providing benefits to lower income population into the future. Over the course of an average Filipino's lifetime, the NHIP is estimated to lose about 40 centavos for every peso an individual contributes directly or indirectly as premium to PhilHealth.

The rest of the report is structured as follows. In the next section, we summarize recent reforms in the country's NHIP, focusing on new entitlements and innovations in financing introduced over the last decade. In Section 3, we then detail the methodology we employed to estimate the incidence of premium contributions and benefits payment by age group and socio-economic status. We discuss our results in Section 4. Finally, in Section 5, we conclude the study with a summary of results, and some implications for policy.

[2] Some exceptions include McClellan and Skinner (1999) who analyzed the benefit and cost incidences of Medicare in the US based on zonal code as proxy for socio-economic status, and age groups as proxy for cohorts.

2. Recent reforms in the Philippine National Health Insurance Program

The country's social health insurance (SHI) system was introduced in the late 1960s as two separate health insurance funds administered by the country's pension systems for public and private sector employees, and a medical care program for those not covered by these two pension systems. These together formed the then Medical Care Program of the country. In 1995, the country's SHI system was reorganized, with the merging of these health insurance funds to form the core of what is now the Philippine Health Insurance Corporation (PhilHealth). PhilHealth was tasked to administer the country's National Health Insurance Program (NHIP), which aims to "provide health insurance coverage and ensure affordable, acceptable, available and accessible health care services for all citizens of the Philippines".[3]

Similar to other social health insurance systems, PhilHealth levies taxes on workers in the form of premium contributions, as well as receives subsidies, grants and aids, and earn income from its investments, to finance benefit payments of covered members. As a health insurance, the NHIP pools risks among covered members and pays for covered health events. As a public reallocations system, the NHIP was envisioned "as a means for the healthy to help pay for the care of the sick and for those who can afford medical care to subsidize those who cannot."[4] Similar to a pay-as-you-go pension system, workers are eligible for continuous health insurance coverage upon retirement after reaching a minimum number of contributions to PhilHealth.

In the early years of PhilHealth, coverage was largely limited to paying members, pensioners, and their dependents. There had been several attempts to broaden the covered population through PhilHealth's sponsored program, although this remains a minor part of PhilHealth operations until more recently. Until 2008, sponsored members comprise at most a fifth of all primary members of PhilHealth. This has since been expanded considerably to cover a greater number of poor households, and of retirees who have not reached the minimum number of contributions to qualify for lifetime membership.

In 2010, PhilHealth adopted the means test protocol of the country's conditional cash transfer program to identify poor families eligible for its sponsored program. With the amendment of the NHIP and the PhilHealth charter in 2013, premium contributions of indigent members are paid by the national government. This free health insurance coverage through the national government was extended eventually to all senior citizens starting in 2014 with the amendment of the Expanded Senior Citizens Act of 2010 (Republic Act [R.A.] 10645). As a result of this expansion, sponsored members represent two-fifths of all primary members in 2020, with the absolute number increasing by more than six-folds since 2008.

This expanded population coverage has been made possible with the increased share of the NHIP on national government levies on tobacco and alcoholic products. Until 2013, the NHIP receives 25 percent of incremental tax revenues from tobacco products. This has since been raised to 80 percent of incremental sin tax revenues from tobacco products and alcoholic beverages. Adjustments in the contribution rates are also expected to further increase the funds available to PhilHealth. In 2018, with the enactment of the Universal Health Care Act, contribution rates are scheduled to be adjusted from the previous 2.5% to a maximum of 5.0% in 2024 in increments of 0.25 percentage points annually starting in 2019.

[3] Article III, Section 5, Republic Act No. 7875 or the National Health Insurance Act of 1995
[4] Ibid.

Table 1. PhilHealth income and expenditure (PhP Billion in constant 2012 prices), 2009-2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total expenditures	30.7	36.0	40.4	52.5	58.7	78.3	98.3	100.4	100.6	103.2	124.7
Benefits payments	26.8	32.0	36.1	47.9	54.0	73.6	92.6	93.3	94.7	97.3	113.9
Formal economy	15.4	17.2	18.8	21.3	20.8	25.3	23.2	22.7	21.6	21.0	24.1
Informal economy	5.0	5.7	7.3	11.2	11.8	19.6	19.7	19.0	19.2	18.7	20.3
Lifetime members + Senior citizens	1.9	2.1	2.4	3.7	4.0	5.3	18.6	22.9	26.5	25.4	30.1
Sponsored programs (excluding senior citizens)	4.5	7.0	7.7	11.8	17.4	23.3	31.1	28.7	27.3	32.2	39.4
Personal services	2.6	2.6	2.8	2.8	2.7	2.7	3.8	5.1	4.0	3.8	3.8
Maintenance and other operating expense	1.4	1.4	1.5	1.7	2.0	2.1	2.0	2.0	1.9	2.1	7.0
Total income	41.7	42.9	44.9	54.2	62.1	88.6	99.7	100.1	100.8	121.3	128.6
Premium contributions	34.6	36.2	38.0	47.4	55.6	82.4	93.1	94.8	95.6	115.5	121.8
Formal economy	26.3	28.2	29.6	31.1	34.6	37.1	37.8	43.8	44.1	57.6	57.3
Informal economy	2.4	2.7	3.0	3.6	4.3	7.2	6.4	4.5	7.1	6.4	6.8
National government subsidy	5.9	5.3	5.4	12.8	16.7	38.1	48.9	46.5	44.5	51.5	57.7
Indigents-NHTS	0.0	0.0	0.0	10.6	12.1	33.3	33.8	31.7	30.1	32.0	25.3
Senior Citizens	0.0	0.0	0.0	0.0	0.0	2.0	12.2	11.9	11.6	16.1	28.2
Others	5.9	5.3	5.4	2.2	4.6	2.8	2.9	2.9	2.7	3.4	4.2
Interest income	6.8	6.7	6.9	6.7	6.4	6.2	6.5	5.2	5.1	5.7	6.6
Other income	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Memorandum Items											
PhilHealth allocation from Sin Taxes	…	…	…	…	…	21.6	22.9	28.5	36.1	41.3	45.5
Consumer price index: Health (2012=100)	90.4	93.8	96.8	100.0	102.7	105.1	107.2	109.5	112.4	116.1	120.2

Source: PhilHealth Annual Audit Reports, various years. Values are in constant 2012 prices. NHTS – National Household Targeting System.

Table 1 presents a summary of PhilHealth's income and expenditures between 2009 and 2019. Over the last decade, NHIP benefit payments increased on average by 15% annually in real terms. By 2015, benefits payment to subsidized members, including sponsored members, senior citizens, and lifetime members, have exceeded those to paying members from the formal and informal sectors, and their dependents.

Premium contributions, on the other hand, increased by 13% annually on average over the same period. This increase in premium contributions has been fueled largely by the increase in national government subsidies, which comprised almost half of all premium contributions in 2019 from less than 20 percent in 2009. National government subsidies over the last decade account for about 90% of total benefit payments to sponsored members, senior citizens, and lifetime members over the same period. Paying members and their dependents, on the other hand, generated about PhP25 surplus for every PhP100 contributed to PhilHealth.

This expansion in government subsidies coincides with the large increase in de jure coverage, particularly between 2008 and 2013, as captured by the National Demographic and Health Surveys (National Statistics Office [NSO] and ICF Macro, 2009; Philippine Statistics Authority [PSA] and ICF International, 2014; PSA and ICF, 2018) (Table 2). In a span of five years, de jure PhilHealth coverage increased by 22.6 percentage points from 37.7% in 2008 to 60.3% in 2013. The largest improvement in coverage during this period may be observed among rural populations (from 32.5% to 61.9%), and those from the lowest quintile by household wealth (from 19.6% to 61.6%). There have also been important improvements in PhilHealth coverage between 2013 and 2017, particularly among the elderly population (from 58.2% to 72.7%), however the expansion is largely among those from households of higher socio-economic status.

Table 2. PhilHealth coverage by selected characteristics: 2013 and 2017

	2008	2013	2017
All population	37.7	60.3	65.8
By sex			
Male	37.4	59.6	64.5
Female	38.1	61.1	67.3
By age group			
Below 60	37.9	59.2	64.2
60 and above	35.9	58.2	72.7
By residence			
Urban	42.9	58.6	65.7
Rural	32.5	61.9	66.0
By wealth quintile			
Lowest	19.6	61.6	59.0
Second	28.6	55.6	60.6
Middle	35.3	52.2	62.1
Fourth	48.2	59.4	68.2
Highest	57.0	72.7	79.2

Source: NSO and ICF Macro (2009), PSA and ICF International (2014), and PSA and ICF (2018). Note: Values refer to de facto PhilHealth coverage as a percent of population.

These recent increase in PhilHealth coverage as a result of shifts in government subsidies has been documented to improve health-seeking behavior and reduce out-of-pocket (OOP) health expenditures among children in poor households (Abrigo and Paqueo, 2017), although it increases OOP health expenditures among the elderly (Abrigo, et. al., 2019). Health-seeking behaviors among poor prime-age adults have been documented to be not affected by PhilHealth coverage (El Omari and Karasneh, 2021).

3. Estimation of cost and benefit incidence

The incidence of PhilHealth premium contributions and benefits utilization are calculated following the standard approaches to estimate National Transfers Accounts (NTA). NTA is a system of accounts that measures how different generations in an economy produce, consume, and share resources in a way that is consistent with the United Nations' (UN) System of National Accounts (UN Department of Economic and Social Affairs [DESA], 2013). In the Philippines, a consistent time series of NTA has been estimated for 1990 to 2015 (Abrigo, et. al., 2020), which has been used to analyze resource allocation in health and financial requirements for universal health care (Abrigo, 2019), population change and fiscal balance (Abrigo, et. al., 2020), and gender and unpaid work (Abrigo and Francisco-Abrigo, 2019).

For each of the sub-accounts of PhilHealth premium contributions and benefits payments for a particular period t, per capita age profiles of contribution or utilization, denoted by $\hat{y}_t(a)$, are calculated from a nationally representative survey following UN-DESA (2013). These profiles are then adjusted by a constant factor, θ_t, to ensure that the aggregated values across age groups when weighted by population, $N_t(a)$, matches control totals, Y_t. Unlike in traditional cost and benefit incidence analyses where the unit cost or benefit is assumed to be constant across population, we allow the unit cost or benefit to vary depending on program, e.g. formal and informal sector, sponsored programs, senior citizens, etc. Table 3 summarizes the indicators and data sources that we used to calculate the unadjusted per capita age profiles for each of the PhilHealth subaccounts in 2019.

In order to capture difference in the incidence of costs and benefits across socio-economic groups, we stratified the population by highest educational attainment. This allows us to trace population groups across their respective lifecycles since educational attainment is relatively persistent beyond a certain age. In our analyses, we use the observed highest grade completed for individuals aged 30 years and over. For those aged below 30 years, we used the highest grade completed in the household as proxy for the yet to be observed highest educational attainment of young household members.[5] Aggregate consistency in this case is achieved through the factor θ_t, which we assume to be constant across age groups, a, and highest grade completed, k, in any period t, as shown in Equation 1.

$$Y_t = \theta_t \sum_k \sum_a \hat{y}_t(a,k) \cdot N_t(a,k) \quad (1)$$

The above specification allows us to discuss the distributional aspects of PhilHealth costs and benefits in the cross-section across the lifecycle and by socio-economic status, as proxied by

[5] For robustness check, we also used the highest grade completed of the household head as proxy for the potential highest educational attainment of individuals aged below 30 years. The results are qualitatively the same. Estimates are available from the author upon request.

highest grade completed, as well as through time using synthetic cohorts as units of analyses. Previous cost and benefit incidence analyses have focused solely on either the generational (e.g. Bommier, et. al., 2010; Cutler and Sheiner, 2000) or the socio-economic (e.g. Asante, et. al., 2016; O'Donnell, et. al., 2008) dimensions of social health insurance costs and benefits. As such, our strategy is closest to that employed by McClellan and Skinner (1999) who calculated cost and benefit incidence of Medicare in the US by age, capturing the generational dimension, and postal code, proxying for socio-economic status.

Unlike other generational analyses that allows the calculation of costs and benefits to true cohorts (e.g. Bommier, et. al., 2010; Cutler and Sheiner, 2000), our longitudinal analyses use synthetic cohorts based on highest educational attainment. While this effectively limits our ability to describe the incidence of costs and benefits across true cohorts over their experienced and projected lifecycles, this nevertheless allows us to analyze the potential longitudinal gains and burden of the current SHI system.

Table 3. Aggregate values, and age profile proxy indicators and data sources

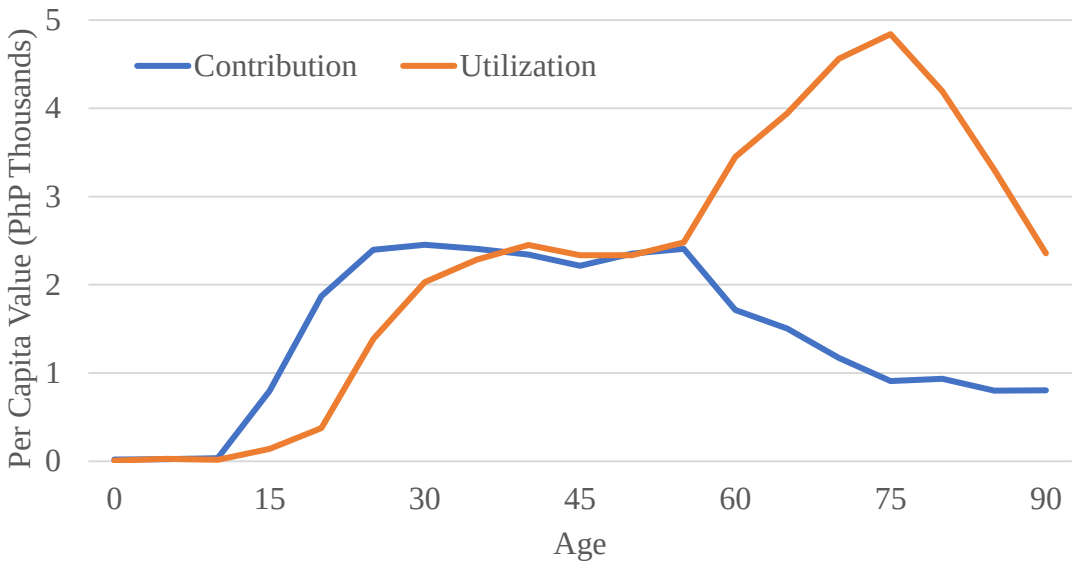
Aggregate Value, Y_t, (Billion PhP)	Description	Age profile, $\hat{y}_t(a,k)$	
		Proxy Indicator	Data source
A. Premium contributions			
50.46	Private sector employees	Daily basic pay	2015 FIES-LFS
18.40	Government employees	Daily basic pay	2015 FIES-LFS
0.06	Kasambahay	Household helpers	2015 FIES-LFS
1.02	Migrant workers	Migrant workers	2015 FIES-LFS
6.48	Self-employed	Self-employed	2015 FIES-LFS
0.62	Pregnant women	Pregnant women	2017 NDHS
B. Premium subsidies from national government			
54.73	Sin taxes	Tobacco and alcoholic beverages consumption	2015 FIES-LFS
14.64	Other government taxes	Consumption except health and education; labor and asset income	2015 FIES-LFS
C. Benefits payments*			
20.37	Private sector employees	Non-poor, non-elderly members	2017 NDHS
8.63	Government employees	Non-poor, non-elderly members	2017 NDHS
24.38	Informal sector workers	Non-poor, non-elderly members	2017 NDHS
36.47	NHTS indigents	Poor, non-elderly members	2017 NDHS
10.92	Other sponsored programs	Poor, non-elderly members	2017 NDHS
13.06	Lifetime members	Elderly PhilHealth members	2017 NDHS
23.14	Senior citizens	Elderly PhilHealth members	2017 NDHS

Source: Aggregate values are based on PhilHealth's 2019 annual audited financial report. Note: NDHS – National Demographic and Health Survey; FIES – Family Income and Expenditure Survey; LFS – Labor Force Survey. *Benefits payment include those for primary members and their dependents. The related proxy indicators refer to health facility utilization among described PhilHealth members.

4. Cost and benefit incidence of social health insurance

The incidence of premium contributions and benefits utilization of social health insurance vary across the lifecycle as shown in Figure 1. The per capita age profile of premium contributions captures the incidence of taxes, including on wages and on consumption of alcoholic beverages and tobacco products, among others, levied to support the country's social health insurance program, as well as the many factors that influence the sources of these taxes. The per capita age profile of benefits utilization, on the other hand, reflects age-specific PhilHealth population coverage rates, morbidity rates, health-seeking behaviors among covered population, and the many other factors that affect these, including supply of health facilities, etc.

Figure 1. Per capita PhilHealth contribution and utilization by age, 2019

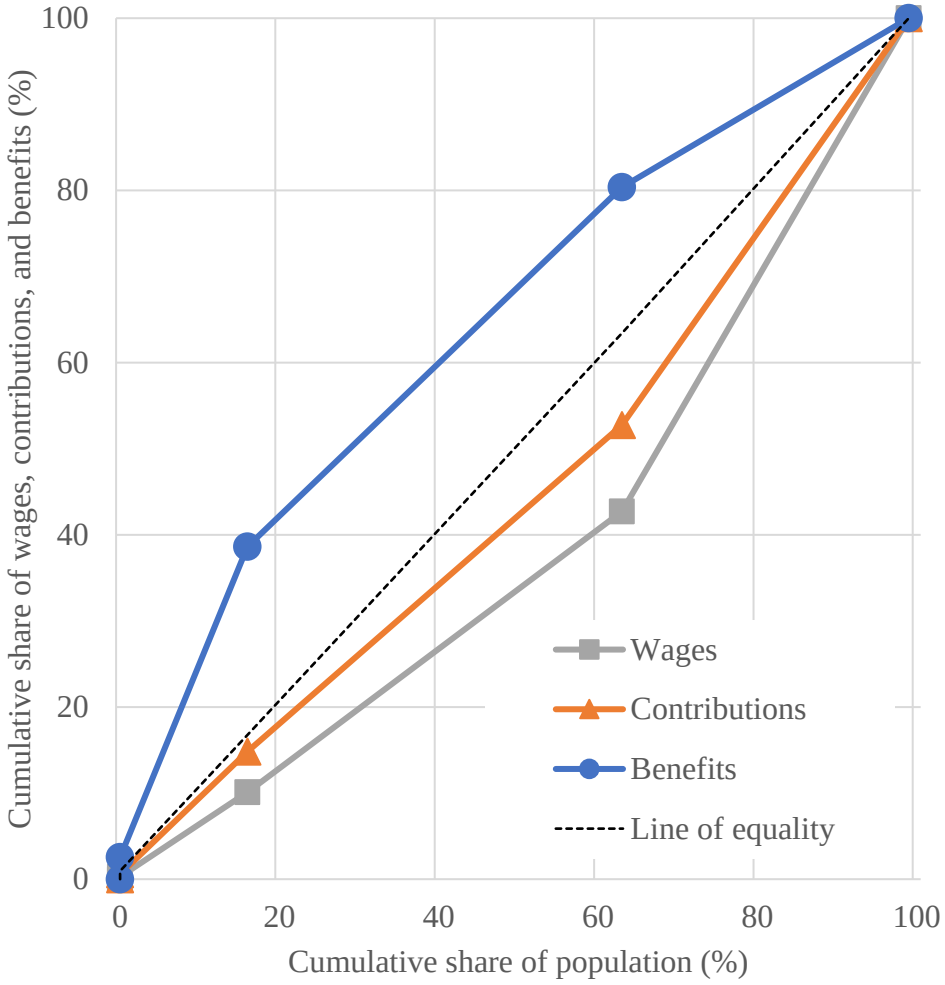


Note: Author's calculations.

Similar to the incidence of labor income (see Abrigo, et. al., 2020), taxes on which remains as the primary source of PhilHealth funding (Table 1), the incidence of premium contributions starts at negligible levels among newborns, increases as cohorts enter the labor force, and eventually declines as workers retire. Unlike the age profile of labor income, however, premium contributions plateaus between age 25 and 55, declines more gradually starting around age 60, and plateaus again starting age 75, which reflects the other sources of premium contributions, i.e., national government subsidies for PhilHealth sponsored programs that are financed through tobacco and alcoholic beverages taxes, and general taxes. Because of these variety in sources, contributions among the young, except for those younger than 15 years, and the elderly are quite substantial, averaging around a third of those paid by prime-age adults.

Similar to the incidence of PhilHealth premium contributions by age, the incidence of benefits utilization begins at negligible levels among newborns, increases starting around adolescence, and plateaus at prime working ages although starting at a much later age. Unlike that for premium contributions, however, utilization increases again around retirement, peaks at around age 75, and declines thereafter. The age profile of PhilHealth utilization is interesting as it does not follow the usual swoosh-shape observed for mortality and morbidity rates by age, particularly among the very young and the very old.

Figure 2. Cumulative share of PhilHealth contributions and benefits, and wages



Note: Author's calculations. Those aged 0 to 29 years are assigned the highest grade completed among members in their household. Aggregate value of lifetime PhilHealth contributions and utilization, and wages by highest grade completed are based on the population age distribution and estimated age schedule of PhilHealth contributions and utilization, and of wages in 2019.

Figure 2 presents concentration curves for the incidence of premium contributions and benefits utilization across educational attainment as proxy for socio-economic status. The concentration curve of pre-tax wages is included as a reference curve. The concentration curve presents the cumulative share of either PhilHealth costs or benefits across the population when sorted by socio-economic status. A curve that is above (below) the 45-degree line of equality indicates that the incidence of costs or benefits is borne more by poorer (richer) populations.

The concentration curves suggest that poorer households receive more benefits, while richer households bear more of the costs to finance PhilHealth. More specifically, the concentration curve of benefits shows that the poorest 63% of population, comprising those who are at most high school educated[6], receive about 80% of all PhilHealth benefits, while they only represent

[6] Note that we use the highest grade completed in the household as proxy for the yet to be observed highest educational attainment of household members aged 29 years and below. The observed highest educational attainment is used for those aged 30 years or older.

53% of all premium contributions in 2019. The richest 37% of the population, on the other hand, only receives 20% of all benefits paid, while providing 47% of all premium contributions in the same year. As such, the incidence of PhilHealth contributions and benefits payments may be said to be both pro-poor.

When taken separately, however, the incidence of PhilHealth contributions and benefits are not both progressive. A reallocation system is said to be progressive when the rate of contribution (benefit) is increasing (decreasing) in some measure of well-being. In terms of concentration curves presented in Figure 2, a contribution (benefit) incidence curve is said to be progressive relative to wages when it is below (above) the incidence curve of wages. In this case, the incidence of PhilHealth benefits is progressive, while that for contributions is regressive.[7]

In order to assess the overall redistributive effect of PhilHealth, we calculated the concentration indices implied by the above distributions of pre-tax wages and post-redistribution income to account for both incidences of PhilHealth contribution and benefits across socio-economic groups. The concentration index ranges between –1 to +1, where a value of –1 (+1) suggests that the poorest (richest) unit in the distribution receives all benefits or bears all costs, depending on application. We calculated the Reynolds-Smolensky (1977) index[8] that compares the pre-tax wage concentration index (+0.2149) and post-redistribution income concentration index (+0.2070). The calculated Reynolds-Smolensky index is –0.0080, which suggests that PhilHealth is a progressive redistribution system. That is, PhilHealth reallocates resources from richer households to poorer households.

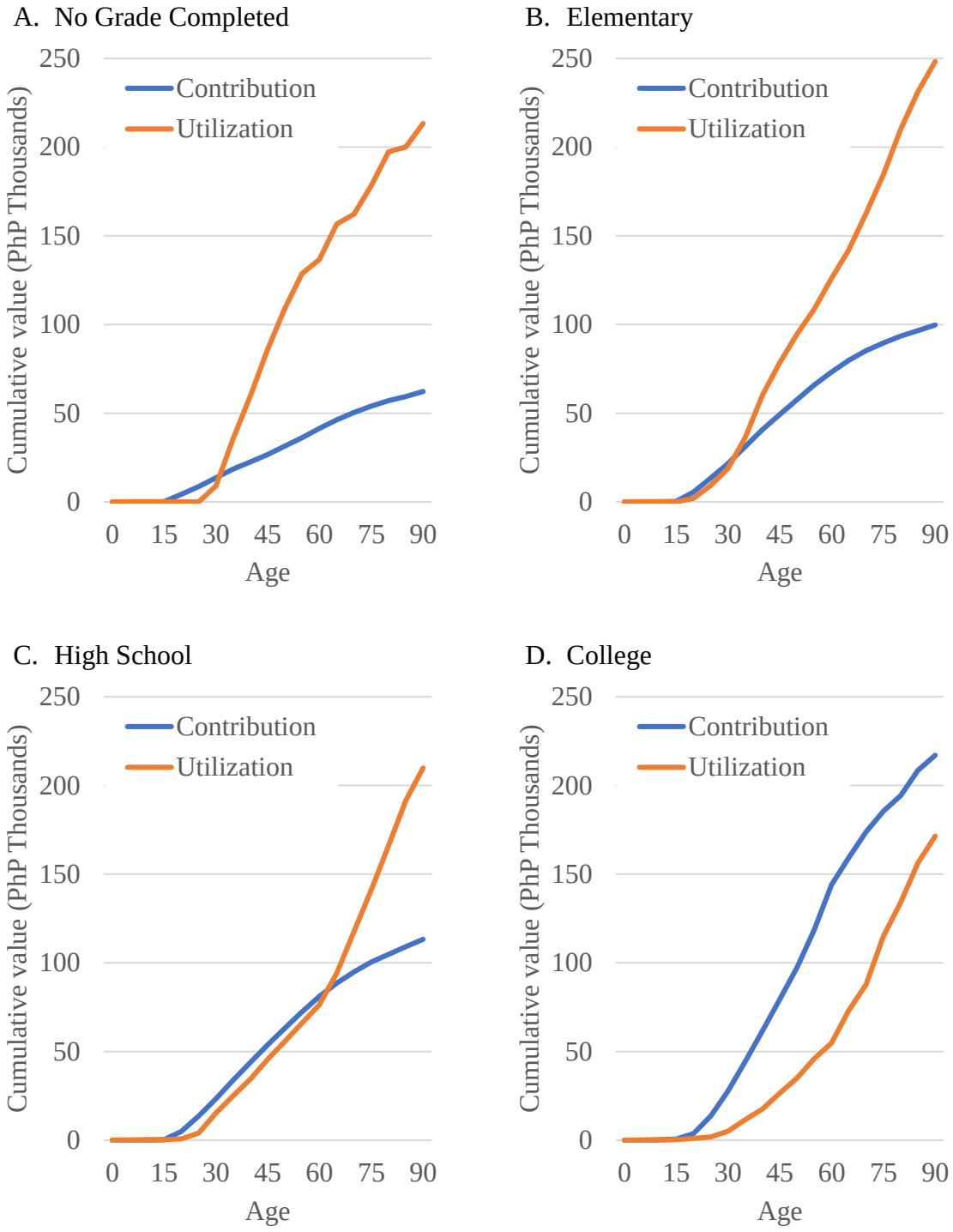
While instructive, the above analysis masks important differences in the lifecycle schedule of PhilHealth costs and benefits across socio-economic groups. As shown in Figure 1, the per capita age schedule of premium contributions is concentrated among prime-age adults, while that for benefits utilization among the elderly. An average Filipino is a net contributor until around age 40, and only becomes a net beneficiary starting after age 55. Given the same age schedule of per capita contributions and benefits, differences in relative population sizes and age distributions of socio-economic groups in a particular time period will affect the relative progressivity of a reallocation system. Indeed, while those who reached at most primary level comprised only 17% of the population, a substantial 27% of them are aged 60 or older, while 55% are aged between 20 and 59. Among those who reached at least high school, on the other hand, only 4.8% are aged 60 or older, while those aged 20 to 59 account for 50%.

In Figure 3, we present the cumulative PhilHealth premium contributions and benefit utilization per person who have survived up to the indicated age by highest grade completed. These per capita age profiles are synthetic cohort measures of what a person of a particular socio-economic class is expected to experience throughout her lifetime if that person is to experience the schedule of costs and benefits faced by people of the same socio-economic class in 2019. This measure allows us to compare the lifetime flow of resources to or from persons of different socio-economic classes.

[7] Progressivity may also be ascertained based on concentration indices implied by concentration curves. A progressive benefit (contribution) incidence has concentration indices lower (higher) than the concentration index of some measure of well-being. In the case of PhilHealth, the implied concentration indices are –0.2805 for benefits, +0.1017 for contributions, and +0.2149 for pre-tax wages.

[8] The Reynolds-Smolensky (1977) index is calculated as C(x) – C(x'), where C(x) and C(x') are the concentration indices of pre- and post-reallocations income, respectively.

Figure 3. Cumulative per capita contribution and utilization: Survival until age(x)



Note: Author's calculations. Those aged 0 to 29 years are assigned the highest grade completed among members in their household.

As may be expected, lifetime per capita premium contribution increases with socio-economic class. At age 90, a person with no grade completed is expected to have contributed PhP62,270 on average throughout her lifetime, while those who reached primary and high school levels would have contributed PhP99,770 and PhP113,290, respectively. A college-educated, on the other hand, would have contributed PhP217,040 over the same period given the age schedule of premium contributions in 2019.

The lifecycle pattern of benefits utilization across socio-economic groups appear to be not as clear cut however. Those who have no grade completed is expected to have used PhP213,380-worth of health care services through PhilHealth until age 90, while those who reached primary level would have expended PhP248,280 on average over the same period. Those who reached high school and college level have lower lifetime utilization of PhilHealth at PhP209,840 and PhP171,450, respectively.

With these lifecycle patterns of premium contributions and benefits utilization, those from lower socio-economic classes are expected to transition earlier as net-beneficiaries from being net-contributors. Those who have reached at most primary level is expected to be net-beneficiaries of PhilHealth in their early 30s and those who reached secondary level in their early 60s. College-educated population continues to be net contributors until age 90.

The returns to PhilHealth is decreasing in socio-economic class among those who live until age 90. Among those with no grade completed, for every PhP1.00 of premium contribution gives a return of PhP3.40 in health care services paid through PhilHealth, or a net benefit of around PhP150,000 conditional on surviving until age 90. Those who reached college level, on the other hand, is expected to lose 20 cents to a peso, or a net loss of PhP45,600 if they survive over the same period. Panel A of Table 4 summarizes the lifetime benefit-cost ratio and net benefit faced by different socio-economic group at different stages of their lifecycle.

The values presented in Figure 3 assumes that a person survives up to the specified ages. It is well known however that social status affects health outcomes, including survival (e.g. Wilkinson, 1992; Marmot, 2005). This is in part reflected in Table 5 that shows the population size by cohort in the 2000 and 2015 Philippine Census of Population (NSO, 2003; PSA, 2016b). Among those with no grade completed aged 65 or older who were censused in 2000, for example, only 20.0% were again censused in 2015. The recorded survival rate[9] for the same cohort is higher among those who reached primary (26.3%), secondary (31.1%), and tertiary (33.5%) education levels. This implies that while those from lower socio-economic groups may be net beneficiaries earlier, and earn higher net benefits from PhilHealth, they only benefit from it at much shorter periods relative to those from high socio-economic groups.

Figure 4 presents similar plots of per capita cumulative PhilHealth premium contributions and benefits utilization as Figure 3 but weighted by survival probabilities implied by Table 5. In these calculations, we assume that individuals live at least until age 30. The results are qualitatively the same, although the levels of expected lifetime contributions and benefits are lower. A summary of the survival-weighted lifetime benefit-cost ratio and net benefit by socio-economic group at different ages are presented in Panel B of Table 4.

[9] It must be emphasized that the "survival rate" in this case does not necessarily mean death among non-surviving population. Instead, non-survival may include international migration and transition into institutional housing, which are not covered by the census of non-institutional population, in addition to death.

Table 4. PhilHealth benefit-cost ratio and net benefit by age and highest grade completed

Age(x)	Benefit-cost ratio					Net benefit (PhP Thousands)				
	Highest grade completed				All	Highest grade completed				All
	No Grade Completed	Elementary	High School	College		No Grade Completed	Elementary	High School	College	
A. Survival until age(x)										
30	0.7	0.9	0.7	0.2	0.4	-4.6	-2.8	-8.1	-22.6	-15.9
40	2.7	1.5	0.8	0.3	0.6	37.5	19.6	-9.4	-44.1	-18.7
50	3.5	1.6	0.9	0.4	0.8	77.8	37.0	-7.4	-62.4	-17.6
60	3.3	1.7	0.9	0.4	0.8	95.2	52.8	-4.7	-89.2	-17.3
70	3.2	1.9	1.2	0.5	1.0	111.8	77.5	22.8	-86.1	3.6
80	3.5	2.2	1.6	0.7	1.3	140.2	116.6	61.3	-60.2	40.2
90	3.4	2.5	1.9	0.8	1.5	151.1	148.5	96.5	-45.6	69.0
B. Survival-weighted until age(x)										
30	0.7	0.9	0.7	0.2	0.4	-4.6	-2.8	-8.1	-22.6	-15.9
40	2.6	1.5	0.8	0.3	0.6	35.6	18.9	-9.4	-43.7	-18.7
50	3.4	1.6	0.9	0.4	0.8	72.1	35.9	-7.5	-61.3	-17.6
60	3.4	1.7	0.9	0.4	0.8	93.9	49.7	-5.2	-84.6	-17.4
70	3.3	1.8	1.1	0.5	1.0	110.8	68.5	13.1	-86.1	-3.5
80	3.3	2.1	1.4	0.6	1.2	125.8	98.5	44.9	-68.2	24.0
90	3.4	2.4	1.8	0.8	1.4	141.0	135.7	83.9	-51.5	57.4

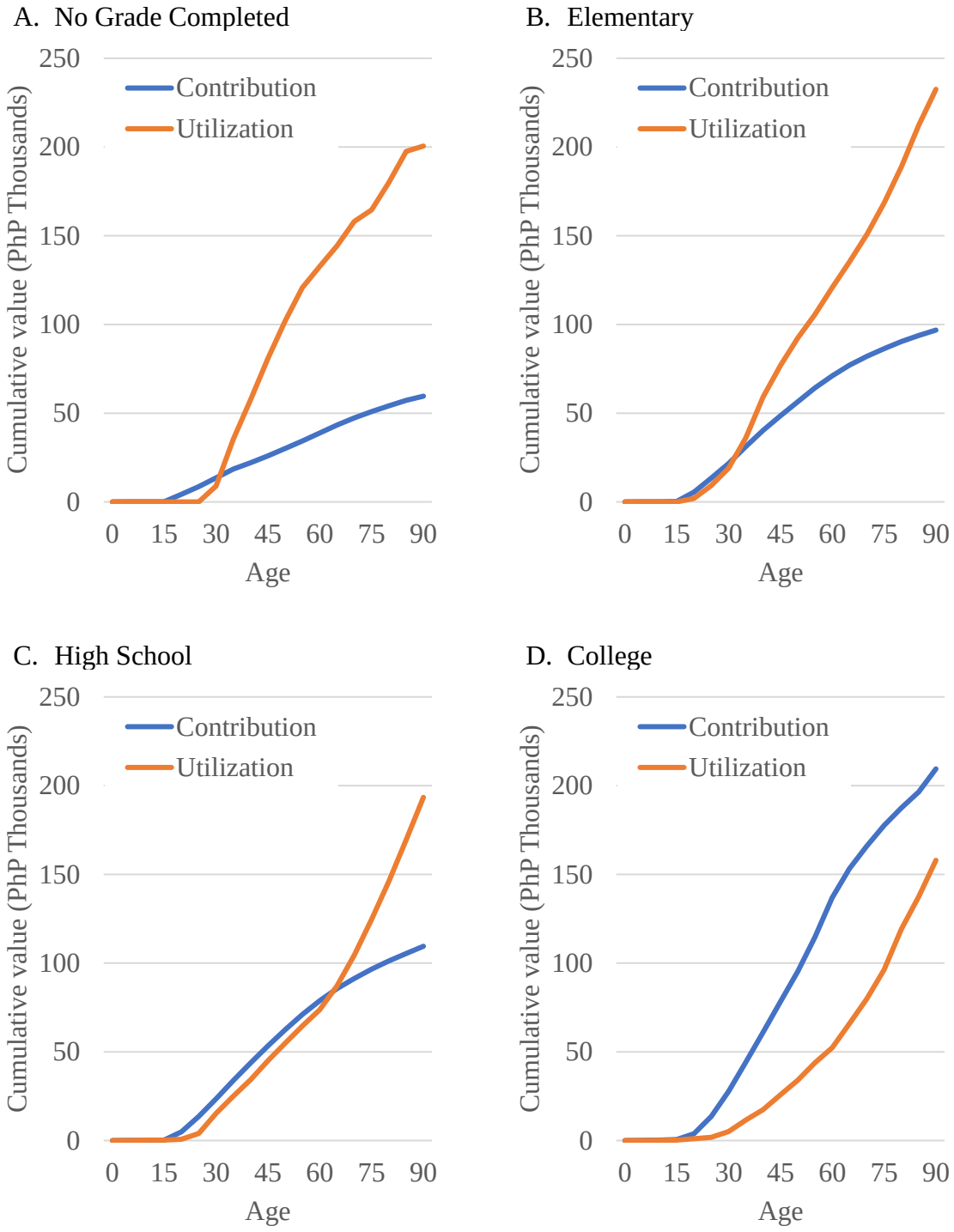
Note: Author's calculations. Those aged 0 to 29 years are assigned the highest grade completed among members in their household. Cumulative lifecycle contribution and utilization in Panel B are weighted by survival probabilities implied by Table 3, conditional on surviving until age 30.

Table 5. Population by cohort and highest grade completed: Philippines, 2000 and 2015

Year Born	Age, Year 2000	Highest Educational Attainment			
		No Grade Completed	Elementary	High School	College
A. 2000 Population (Thousands)					
1966 - 1970	30-34	115.0	1,603.3	2,232.2	1,573.4
1961 - 1965	35-39	132.6	1,613.1	1,771.5	1,367.9
1956 - 1960	40-44	118.1	1,613.6	1,372.4	1,046.3
1951 - 1955	45-49	112.2	1,447.2	1,003.3	758.9
1946 - 1950	50-54	107.9	1,305.1	651.1	552.2
1941 - 1945	55-59	101.8	1,088.2	397.3	312.8
1936 - 1940	60-64	111.6	970.0	331.1	217.7
Before 1936	65+	380.7	1,797.6	425.7	322.8
B. 2015 Population (Thousands)					
1966 - 1970	30-34	102.3	1,484.6	2,201.8	1,473.3
1961 - 1965	35-39	94.8	1,416.2	1,662.1	1,242.2
1956 - 1960	40-44	77.0	1,373.3	1,230.2	916.8
1951 - 1955	45-49	72.3	1,191.8	854.7	636.8
1946 - 1950	50-54	63.6	956.7	481.2	411.4
1941 - 1945	55-59	58.9	706.5	246.9	205.8
1936 - 1940	60-64	46.7	518.8	170.7	121.3
Before 1936	65+	76.5	473.3	132.2	108.2
C. 2000-2015 Compound Annual Growth Rate (%)					
1966 - 1970	30-34	-0.8	-0.5	-0.1	-0.4
1961 - 1965	35-39	-2.2	-0.9	-0.4	-0.6
1956 - 1960	40-44	-2.8	-1.1	-0.7	-0.9
1951 - 1955	45-49	-2.9	-1.3	-1.1	-1.2
1946 - 1950	50-54	-3.5	-2.0	-2.0	-1.9
1941 - 1945	55-59	-3.6	-2.8	-3.1	-2.8
1936 - 1940	60-64	-5.6	-4.1	-4.3	-3.8
Before 1936	65+	-10.1	-8.5	-7.5	-7.0

Source of basic data: NSO (2003), PSA (2016b). Note: Non-response were assumed to be missing at random; population with missing highest grade completed are allocated proportionally using the distribution of non-missing highest grade completed by age.

Figure 4. Cumulative per capita contribution and utilization: Survival-weighted until age(x)



Note: Author's calculations. Those aged 0 to 29 years are assigned the highest grade completed among members in their household. Cumulative lifecycle contribution and utilization are weighted by survival probabilities implied by Table 5, conditional on surviving until age 30.

Based on Panel B of Table 4, and Figure 5, it is clear that the PhilHealth system is more of a public reallocations system, rather than an "actuarially fair" insurance program. An actuarially fair insurance would have charged lifetime premiums equal to the survival-weighted lifetime claims on the insurance pool (c.f. Pauly, 1974). That is, in the case of PhilHealth, the benefit-cost ratio would have to be close to 1.0, or the expected net benefit close to zero around the end of the lifecycle. However, we have documented substantial departure from the "actuarially fair" case at age 90 across all socio-economic groups. Indeed, even when averaged across the population, the PhilHealth system generates a survival-weighted lifetime benefit-cost ratio of 1.4, and net benefit of PhP57,400 per capita. This may have important implications on the long-term sustainability of the country's social health insurance system.

In order to assess the size and direction of expected lifetime PhilHealth reallocations among the population alive in 2019, we calculated aggregate and per capita transfer wealth by socio-economic class. Transfer wealth is the net present value of transfers from a reallocation system a person or group of persons is expected to receive for the remainder of their lifetime. For a specific cohort born at period c,the cohort-specific transfer wealth T_c is given by

$$T_c = \sum_t \left(\frac{1}{1+r}\right)^{t-c} [\tau^+(t-c) - \tau^-(t-c)] \cdot N(t-c) \quad (2)$$

where $t-c$ is the cohort's age in years, $\tau^+(t-c)$ and $\tau^-(t-c)$ are the respective transfer inflows and outflows, $N(t-c)$ is the surviving cohort size, and r is an exogenous discount rate. The economy-wide transfer wealth is the sum of all cohort-specific transfer wealth.

We present aggregate and per capita PhilHealth transfer wealth for the population alive in 2019 in Table 6. We use a discount rate of 0% to capture the expected financial deficit or surplus from PhilHealth operations for each socio-economic class. The presented transfer wealth may therefore be seen as an upper bound for any non-negative discount rate.

Our calculations show that holding the age schedule of PhilHealth premium contributions and benefits payment in 2019 constant and using the implied survival rates from Table 5, the NHIP is projected to require an additional PhP6.3 trillion over what PhilHealth may generate from remaining lifetime premium contributions to cover the benefit claims of the population alive in 2019. While the college-educated population is projected to generate a surplus of PhP1.3 trillion over their remaining lifetime, it cannot fully cover the projected deficits from lower socio-economic groups totaling PhP7.6 trillion.

Table 6. Transfer wealth and effective lifetime tax rate by highest grade completed

	Highest grade completed				All
	No Grade Completed	Elementary	High School	College	
Transfer wealth					
Aggregate (PhP Trillions)	0.1	2.6	4.8	-1.3	6.3
Per capita (PhP Thousands)	148.4	156.6	95.8	-33.3	58.7
Effective tax rate					
Current system	6.8	4.0	3.5	2.7	3.3
Actuarially fair rate	22.8	9.6	6.1	2.0	5.3

Note: Author's calculations.

Table 6 also shows the implied tax rate if premium contributions are all levied on wages, rather than on many different sources. The results suggest that the current contribution rates are regressive, supporting our earlier claim based on the cross-sectional distribution of premium contributions. For PhilHealth to be actuarially fair given the calculated age schedule of benefits, tax rates on wages need to increase by 16.1 percentage points for those with no grade completed, 5.6 percentage points for those who reached elementary level, and 2.6 percentage points for those who reached high school level. Premium contribution rates among college-educated, on the other hand, need to be decreased by 0.7 percentage points. On average, the actuarially fair contribution rates if wholly levied on wage income is at 5.3% given the age schedule of benefit utilization and the age distribution of each socio-economic group in 2019. This rate is higher by 2 percentage points relative to the observed average contribution rate of 3.3% of wages in 2019.

When we consider the wealth associated with the remaining lifetime of the population alive in 2019, PhilHealth premium contributions and benefits payment remain both pro-poor, with the latter being progressive, and the former being regressive (Figure 5).[10] As a whole, PhilHealth is a progressive reallocations system with a Reynolds-Smolensky index of –0.0151.

5. Conclusions

In this paper, we estimated the incidence of PhilHealth premium contributions and benefits payment across the lifecycle by socio-economic class. We found that PhilHealth contribution and utilization are both pro-poor. Despite premium contributions being regressive, PhilHealth as a whole is a progressive transfer system that reallocates resources from higher income to lower income populations. These observations are true for the cross-section of population alive in 2019, as well as for their expected lifetime flow of resources if the age schedule of PhilHealth benefits and costs remain the same as what people in 2019 had faced.

We also document large imbalances in the average levels of contribution and utilization across the lifecycle. Indeed, per capita PhilHealth contribution and utilization are roughly equal only in the beginning, until around age 10, and the middle, between age mid-30s to mid-50s, of the lifecycle. Everywhere else individuals are either net contributors or net beneficiaries. This may have important implications on the sustainability of the country's social health insurance program, especially in light of imminent population ageing, if the current age profiles of premium contributions and benefits utilization persist into the future.

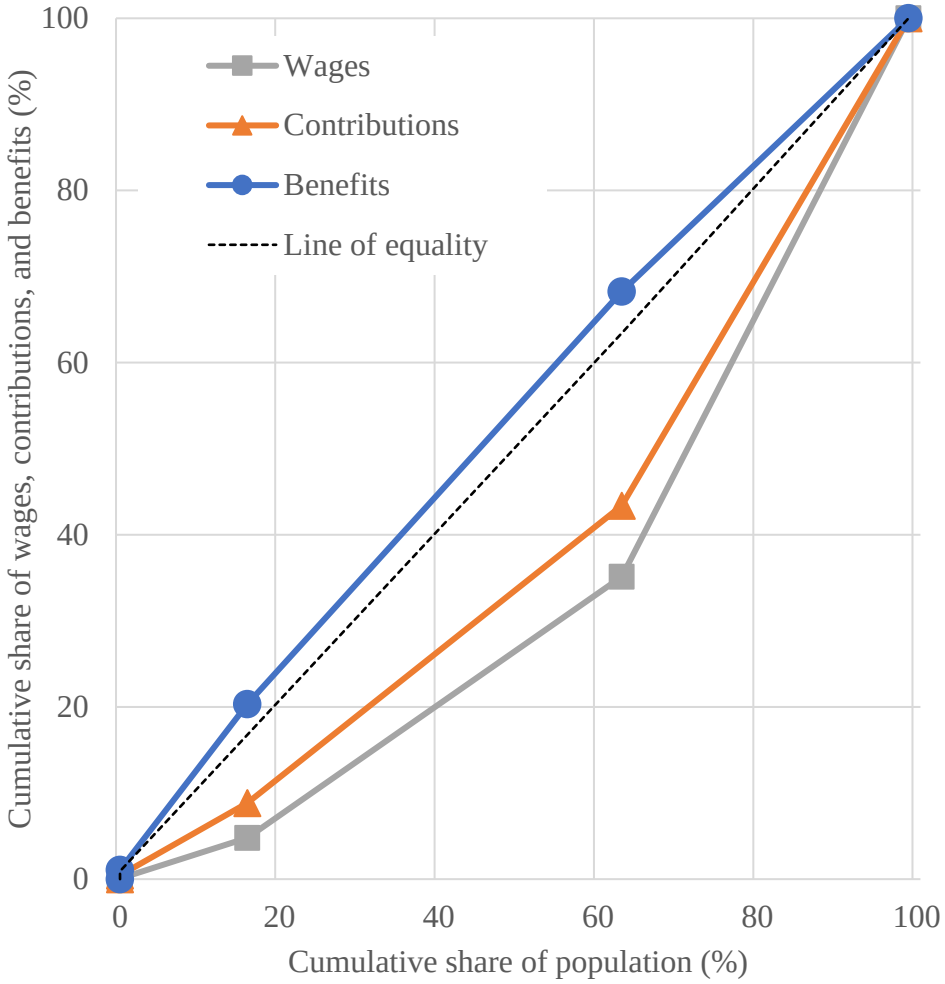
Despite running current surpluses, PhilHealth is projected to face large financial deficits if the current system continues. Over the course of an average Filipino's lifetime, PhilHealth is estimated to lose about 40 centavos for every peso of premium contributions to its system. While surpluses may be generated from higher income population, these may not be enough to cover the projected deficits from providing benefits to lower income population into the future.

There may be many solutions to this impending problem. However, this entails clarifying the nature and role of PhilHealth in ensuring affordable, acceptable, available and accessible health care services for Filipinos. As a government reallocations program that provides a social safety net to ensure universal access to health care, benefits may need to be further increased to more

[10] The calculated concentration indices based on the present value of each account for the population alive in 2019 are as follows: premium contributions (+0.2170), benefits payment (–0.0629), pre-reallocation wages (+0.3115), and post-reallocation wages (+0.2965).

greatly encourage pro-social health-seeking behavior, especially among the poor. As a pseudo-pension system that transfers resources from current workers to retirees for health spending, these benefits may need to be re-assessed based on the capacity of current and future workers to carry the burden of financing these entitlements. As a health insurance program, population risks and utilization levels need to be rigorously accounted for to ensure that the system remains actuarially fair. In all these potential roles, what is clear is that the current system of premium contributions and benefits payment is fiscally unsustainable in the longer term.

Figure 5. Cumulative share of lifetime PhilHealth contributions and benefits, and wages



Note: Author's calculations. Those aged 0 to 29 years are assigned the highest grade completed among members in their household. Aggregate value of lifetime PhilHealth contributions and utilization, and wages by highest grade completed are based on the population age distribution of cohorts living in 2019; the age schedule of PhilHealth contributions and utilization, and of wages in 2019; and the survival probabilities implied by Table 5.

References

Abrigo, M.R.M. (2019). Financing universal health care in an ageing Philippines. Philippine Institute for Development Studies Discussion Paper No. 2019-23. Quezon City, Philippines: PIDS.

Abrigo, M.R.M., and K.A. Francisco-Abrigo (2019). Counting women's work in the Philippines. In C.G. Bayudan-Dacuycuy (editor), *Outside looking in: Gendered perspectives in work and education*. Quezon City: PIDS.

Abrigo, M.R.M., and V.B. Paqueo (2017). Social protection and demand for health care among children in the Philippines. *Philippine Journal of Development*, 44(1), 45-70.

Abrigo, M.R.M., R.H. Racelis, J.M.I. Salas, D.A.P. Ortiz, and A.N. Herrin (2020). *Are we missing out on the demographic dividend? Trends and prospects*. Quezon City, Philippines: PIDS.

Abrigo, M.R.M., T.J. Halliday, and T. Molina (2019). Expanding health insurance for the elderly in the Philippines. IZA Discussion Paper No. 12827. Bonn, Germany: Institute of Labor Economics.

Asante, A., J. Price, A. Hayen, S. Jan, and V. Wiseman (2016). Equity in healthcare financing in low- and middle-income countries: A systematic review of evidence from studies using benefit and financing incidence analyses. *PLoS ONE*, 11(4), e0152866.

Birdsall, N. and J. Nellis (2003). Winners and losers: Assessing the distributional impact of privatization. *World Development*, 31(10), 1617-1633.

Bommier, A., R. Lee, T. Miller, and S. Zuber (2010). Who wins and who loses? Public Transfer Accounts for US generations born 1850 to 2090. *Population and Development Review*, 36(1), 1-26.

Culter, D.M., and L. Sheiner (2000). Generational aspects of Medicare. *American Economic Review*, 90(2), 303-307.

Davoodi, H.R., E.R. Tiongson, and S.S. Asawanuchit (2010). Benefit incidence of public education and health spending worldwide: Evidence from a new database. *Poverty and Public Policy*, 2(2), Article 2.

Devarajan, S., and S.I. Hossain (1998). The combined incidence of taxes and public expenditure in the Philippines. *World Development*, 26(6), 963-977.

Dinan, T.M., and D.L. Rogers (2002). Distributional effects of carbon allowance trading: How government decisions determine losers and winners. *National Tax Journal*, 55(2), 199-221.

El Omari, S., and M. Karasneh (2021). Social health insurance in the Philippines: Do the poor really benefit? *Journal of Economics and Finance*, 45, 171-187.

Holzmann, R. (2013). Global pension systems and their reform: Worldwide drivers, trends and challenges. *International Social Security Review*, 66(2), 1-29.

Kakwani, N. (1977). Measurement of tax progressivity: An international comparison. *The Economic Journal*, 87(345), 71-80.

Manasan, R.G. (2018). Assessment of Republic Act 10963: The 2017 Tax Reform for Acceleration and Inclusion. Philippine Institute for Development Studies Discussion Paper No. 2018-27. Quezon City, Philippines: PIDS.

Manasan, R.G., and J.S. Cuenca (2010). Benefit incidence of public spending on health in the Philippines. Philippine Institute for Development Studies Discussion Paper No. 2010-36. Makati City, Philippines: PIDS.

Manasan, R.G., J.S. Cuenca, and E.C. Villanueva-Ruiz (2008). Benefit incidence of public spending on education in the Philippines. Philippine Institute for Development Studies Discussion Paper No. 2008-08. Makati City, Philippines: PIDS.

Marmot, M. (2005). Social determinants of health inequities. *The Lancet*, 365, 1099-1144.

Mason, A. (2006). Population ageing and the demographic dividends: The time to act is now. *Asia-Pacific Population Journal*, 21(3), 7-16.
Mason, A., and R. Lee (2007). Transfers, capital, and consumption over the demographic transition. In *Population aging, intergenerational transfers, and the macroeconomy*, edited by R. Clark, N. Ogawa, and A. Mason. Cheltenham, United Kingdom: Edward Elgar.
McClellan, M., and J. Skinner (1999). Medicare reform: Who pays and who benefits? *Health Affairs*, 18(1), 48-62.
National Statistics Office [Philippines] (2003). Census of Population and Housing 2000. Public-use file. Database. Manila, Philippines: NSO.
National Statistics Office [Philippines], and ICF Macro (2009). *National Demographic and Health Survey 2008*. Calverton, Maryland, USA: NSO and ICF Macro.
Neary, J.P. (1994). Cost asymmetries in international subsidy game: Should government help winners and losers. *Journal of International Economics*, 37(3-4), 197-218.
O'Donnell, O., E. van Doorslaer, R.P. Rannan-Eliya, A. Somanathan, S.R. Adhikari, B. Akkazaieva, D. Harbianto, C.C. Garg, P. Hanvoravongchaih, A.N. Herrin, M.N. Huq, S. Ibragimova, A. Karan, S. Kwon, G.M. Leung, J.R. Lu, Y. Ohkusa, B.R. Pande, R. Racelis, K. Tin, K. Tisayaticom, L.Trisnantoro, Q. Wan, B.-M.Yang, and Y. Zhao (2008). Who pays for health care in Asia? *Journal of Health Economics*, 27(2), 460-475.
Orbeta, A.C. Jr, and V.B. Paqueo (2017). Who benefits and loses from untargeted tuition subsidy for students in SUCs? Policy Notes No. 2017-03. Quezon City, Philippines: PIDS.
Paqueo, V.B., A.C. Jr. Orbeta, and G.M. Llanto (Eds.) (2017). *Unintended consequences: The folly of uncritical thinking*. Quezon City, Philippines: PIDS.
Pauly, M.V. (1974). Overinsurance and public provision of insurance: The roles of moral hazard and adverse selection. *Quarterly Journal of Economics*, 88(1), 44-62.
Philippine Statistics Authority (2016a). Family Income and Expenditure Survey 2015. Public-use file. Database. Quezon City, Philippines: PSA.
Philippine Statistics Authority (2016b). Census of Population 2015. Public-use file. Database. Quezon City, Philippines: PSA.
Philippine Statistics Authority, and ICF (2018). *Philippines National Demographic and Health Survey 2017*. Quezon City, Philippines, and Rockville, Maryland, USA: PSA and ICF.
Philippine Statistics Authority, and ICF International (2014). *Philippines National Demographic and Health Survey 2013*. Manila, Philippines, and Rockville, Maryland, USA: PSA and ICF International.
Reynolds, M. and E. Smolensky (1977). Post-fisc distributions of income in 1950, 1961, and 1970. *Public Finance Quarterly*, 5(4), 419-438.
Shah, A., and J. Whalley (1991). Tax incidence analysis of developing countries: An alternative view. *World Bank Economic Review*, 5(3), 535-552.
United Nations Department of Economic and Social Affairs (2013). *National Transfer Accounts Manual: Measuring and analyzing the generational economy*. New York, New York: UN.
Wagstaff, A. (2010). Social health insurance reexamined. *Health Economics*, 19(5), 503-517.
Wilkinson, R.G. (1992). Income distribution and life expectancy. *British Medical Journal*, 304(6820), 165-168.