

Determinants of the Per capita Out-of Pocket Health Expenditure of the 4Ps Families in the Philippines

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Abstract: Out-of-Pocket (OOP) health expenditure is said to be the major source of the total health expenditures in the Philippines despite the alternative health-financing mechanisms provided by the government. This paper aims to identify the effects of per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, availing of medical check up, location, unsafe water source and the availing of supplementary feeding program to per capita out of pocket health expenditure particularly on medical products, therapeutic gadgets and equipment of the 4Ps families in the Philippines. The study applies a multiple linear regression model using a cross sectional secondary data obtained from the 2013 Annual Poverty Indicators Survey (APIS) in the Philippines. The result reveals that 4PS Families per capita out-of-pocket health expenditure on medical products therapeutic gadgets and equipment was affected by their per capita family income, family size, male family head, proportion of family age group with 60 years old and above, education level of the family head with high school level and the proportion of family with ill members. Thus, it is recommended that policy makers may find a way to improve and implement a better public health services so that 4Ps families can get any health services they need without imposing additional financial burden on their families.

Keywords: per capita out- of pocket health expenditure, medical product expenditure, 4Ps families

I. RATIONALE

The Pantawid Pamilyang Pilipino Program (4Ps) is a CCT program of the Department of Social Welfare and Development (DSWD) that provides cash grants to poorest of the poor beneficiary households conditional on compliance to specified investments on human capital, mainly sending children to school and availing of preventive health care services (Official Gazette 2014).

The program aims to strengthen the mission of the Philippine government to guarantee equitable, sustainable and quality health to all Filipinos, especially the poor and to lead the quest for excellence in health (DOH n.d.). Likewise, the program helps the government fulfill its commitment to the Sustainable Development Goals (SDGs) especially in ensuring healthy lives and promoting well-being for all at all ages, particularly at the most vulnerable stages of life, providing health services, and improving imbalances between poorer and richer countries (World Bank 2016).

In 2014, findings from the Philippine National Health Accounts (PNHA) showed that the Department of Health increased its health spending from 36.8B in 2013 to 39.1B. In addition, the social insurance outpaced the growth in government, private or other sources of health expenditures with 38.0 percent increase, from 60.4B in 2013 to 83.3B in 2014. The big rise was brought about by the improved National Health Insurance Program (NHIP) implemented by the Philippine Health Insurance Corporation (PHIC) (PSA 2016).

It may be noted that the PHIC has intensified its advocacy to provide health insurance coverage with the aim of providing affordable and accessible health care services for all citizens of the Philippines (PSA 2016). With the implementation of the Republic Act No. 7875 as amended by Republic Act No. 9241, RA 10606, data showed in 2015 that nine (9) out of ten (10) Filipinos were covered by the Philhealth Insurance. This translates to 93.4 million members and dependents or 92% of the entire population that are entitled to avail of benefits under the National Health Insurance Programm (Philhealth 2015).

However, Ulep and Dela Cruz (2013) reported that despite the social safety nets on the domestic healthcare are in place to facilitate access among Filipino people, OOP expenditures remain to be Filipinos' major source of financing when healthcare is most needed. Further, the researchers cited in their study that based on the data of FIES in 2012, medicines account for more than half of pocket expenditures and the poorest spend less on inpatient and outpatient care services relative to their total OOP health expenditures; which suggests heavy reliance on medicines in lieu of actual visit to a health facility. Thus, it is in this reliance that OOP expenditures pushes Filipino households into poverty.

Philippine Statistical Authority (2016) recorded that according to the PNHA, Filipino households spent P296.5 billion for OOP health expenses in 2013. The data showed that this represented 56.3 percent of the total health expenditure, worth P526.3 billion, in 2013. This also showed that per capita health expenditure in the country rose by 8.5 percent from 5,400 pesos in 2013 to 5,859 pesos in 2014 at current prices, while, at constant 2006 prices, per capita health expenditure increased by 4.2 percent.

Hence, this study aims to identify the effects of per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, availing of medical check up, location, unsafe water source and the availing of supplementary feeding program to per capita out of pocket health expenditure particularly on medical products, therapeutic gadgets and equipment of the 4Ps families in the Philippines.

Statement of the Research Question

This study investigates the effect of per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, availing of medical check up, location, unsafe water source and the availing of supplementary feeding program to per capita out of pocket health

expenditure particularly on medical products, therapeutic gadgets and equipment of the 4Ps families in the Philippines. Specifically, this seeks to answer the question: Do 4Ps families spend more from out of their own pocket on health particularly on medical products, therapeutic gadgets and equipment?

II. SIGNIFICANCE OF THE STUDY

This study contributes to the existing literature on out-of pocket health expenditure through the analysis of health care benefits and services provided to the 4Ps families. Likewise, this will be significant to government agencies such as the Department of Social Welfare and Development, Philippine Health Insurance Corporation and the non-government organizations that are concerned with health care services for those who are below the poverty line.

III. REVIEW OF RELATED LITERATURE

This section consists of policies, theories and related studies on out-of pocket health expenditures on medical products, therapeutic gadgets and equipment derived from other researchers.

A. Policy issues

Out-of Pocket expenditure on health is defined by the World Bank as to any direct outlay by households, including gratuities and in-kind payments, to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups. In many developing countries, household OOP spending on health constitutes a significant share of total health care expenditure. The World Health Organization (WHO) estimates, that globally, private expenditure on health in most countries is approximately 1.5 to 3.0 percent of their Gross Domestic Product (GDP). In 2013, it was estimated globally that OOP expenditure as a percentage of private expenditure on health, was 51.6 %. Moreover, in 2012, the WHO estimated that private health expenditure as a percentage of total health expenditure was 62.5% for low income countries, and 44.4% and 38.5% for upper middle income and high income countries, respectively (Ministry of Health and Quality of Life Survey Report 2015)

In the Philippines, data from Philippine Statistical Authority (2016) indicates that total health expenditure (THE) went up by 11.7 percent, from Php 471.1 billion in 2012 to Php 526.3 billion in 2013. This could be mainly attributed to the large amount used for health care by private sources, majority of which has been disbursed by household's out-of pocket for their health needs, amounting 82.6 percent of the total health expenditure. From 2005- 2011, OOP continues to be the major source, while social insurance accounts 9.1 percent only of the total health expenditure, as shown in table 1 .

Table 1: Distribution of Health Expenditure by Source of Funds, 2005-2011

Sources of Funds	Percent Share						
	2005	2006	2007	2008	2009	2010	2011
Government	28.7	27.2	27.5	24.8	25.9	26.6	27
Nat'l. Govt.	14.5	13.6	12.2	12.1	10.8	11.4	12.3
Local Govt.	14.2	13.6	15.4	12.7	15.1	15.2	14.7
Social Insurance	8.7	7.7	7.4	7.1	8.1	8.9	9.1
NHIP	8.7	7.7	7.4	7.1	8.1	8.9	9.1
Employees Compensation	0	0	0	0	0	0	0
Private Sources	61.6	63.3	64.7	66.9	63.7	62.8	63.1
OOP	51.9	64	55	56.7	53.3	52.5	52.7
Private insurance	1.9	1.6	1.6	1.7	1.8	1.7	1.7
Health Maintenance Org.	4.5	4.5	4.9	5.2	5.3	5.6	5.7
Private Establishments	2.4	2.2	2.2	2.3	2.3	2.1	2.2
Private Schools	1	1	1	1	1	1	0.9
Rest of the World (Grant)	1	1.8	0.3	1.2	2.2	1.7	0.8
All sources	100	100	100	100	100	100	100

Source: Philippine Statistical Authority

Ideally, according to the study of Ulep and Dela Cruz (2014) OOP expenditure should be low especially when there is an alternative health-financing mechanism provided by the government. In countries with successful health-financing strategies, the OOP level could go as low as 15 percent -30 percent. In Germany, for example, where the GDP is US\$32,860 per capita, 11.3% of all medical expenses are borne by households and the rest by social health insurance or by the government (WHO 2007).

Filipino households, on the other hand, spent P296.5 billion for OOP health expenditure in 2013 based on the PNHA record. The data showed that this represented 56.3 percent of the total health expenditure, worth P526.3 billion, in 2013. This also showed that per capita health expenditure in the country rose by 8.5 percent from 5,400 pesos in 2013 to 5,859 pesos in 2014 at current prices, while, at constant 2006 prices, per capita health expenditure increased by 4.2 percent (PSA 2016).

Ulep and Dela Cruz (2013) found from their study that drugs or medicines continue to account for major slice of OOP expenses. This is validated by previous studies conducted by Lavado and Ulep (2011) using the 2000 data of FIES. Such high share of drugs or medicines reflects the limited benefit package offered by Philhealth particularly pharmaceutical benefits. The average expenditure on medical products is higher among the richer quintile, but the share to total expenditure is higher among the poor. These findings might suggest that poor households heavily rely on medicines in lieu of actual health facility visits. They tend to use more medicines and delay or forgo expensive health procedures (e.g. surgery and diagnostic tests) to reduce health expenditure.

In recent years, Philippine government strengthens its effort to provide an alternative health financing to OOP by providing comprehensive health services to all Filipinos through a socialized health insurance program that will prioritize the health care needs of the underprivileged, sick, elderly, persons with disabilities (PWDs), women and children and provide free health care services to indigents, as part of the implementation of Republic Act 10606 also known as the "National Health Insurance Act of 2013", an act amending Republic Act No. 7875. As a result, nine (9) out of ten (10) Filipinos were covered by the Philhealth Insurance in 2015. This translates to 93.4 million members and dependents or 92% of the entire population are entitled to avail the benefits under the National Health Insurance Program (Philhealth 2015).

B. Theoretical Framework

B.1 Engle's Curve

Income-consumption curve, which refers to a curve tracing the utility-maximizing combinations of two goods as the consumer's income changes, can be used to construct Engel curves, which describes the relationship between the quantities of a good consumed and income, can be useful in showing how consumer expenditures vary with income. An upward-sloping Engel curve applies to all normal goods. This implies that consumers want to buy more as their incomes increase. However, the portion of the Engel curve that slopes downward is the inferior good that explains that consumption falls when income rises (Pindyck and Rubinfeld 2008).

The Engel curve was applied to examine how consumer spending varies among different income groups. Using the US Consumer Expenditure Survey Annual Report in 2005, it was found out that an average per-household expenditure on rented dwellings, health care, and entertainment are plotted as functions of annual income. Health care and entertainment are normal goods, as expenditures increase with income. Rental housing, however, is an inferior good for income above \$35,000 (Pindyck and Rubinfeld 2008).

C. Related Studies

Several studies have conducted on OOP health expenditures in different countries; they found possible factors that may influence the OOP health expenditure on medical products, therapeutic gadgets and equipment. Among such factors are the per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, availing of medical check up, location and the unsafe water source.

Fang, et al. (2011) analysis on per capita medical expense using demographic survey conducted in three cities in western China in 2011 suggested that the level of per capita medical expense was significantly associated with household size, presence of members younger than 18, older than 65, basic health insurance coverage, per capita income, and household head occupation. The association between medical expense and household head occupation could be partly explained by the association between occupation and income (in China, government, state-owned company, and private company employees tended to have higher income) and differences in basic health insurance systems for people with different occupations.

Moreover, Halliday and Park (2009) used the 5-year panel, 2003-2007, from the Medical Expenditures Survey (MEPS) of the American families and individual to investigate the relationship between household size and the demand for medical care. A Tobit regression was applied to analyze the data. The study showed that larger family is associated with lower consumption of medical care *ceteris paribus*. This result is true if household size is an adequate proxy for family support and if family support is protective of one's health, then it is observed that larger households have fewer expenses on formal medical care *ceteris paribus*. Also, if household size is a proxy for family care, then this suggests that family care-giving substitutes for medical care obtained on the market.

Meanwhile, Monhanty, et al. (2014) made use of the consumption expenditure data, National Sample Survey, 2009-2010 to test the hypothesis that the monthly per capita household health spending of elderly is significantly higher than the non-elderly households in India. The households are classified into three mutually exclusively groups; households with only elderly members (elderly households), households with elderly and non-elderly members and households without any elderly member. The health spending includes the institutional (hospitalization) and non-institutional health expenditure of the households, standardized for 30 days. Descriptive statistics and a two part regression model are used to understand the differentials in health expenditures across households. The results indicate that the monthly per capita health spending increases with economic status, occupation, age and educational attainment of the head of the household. Controlling for socioeconomic and demographic correlates, the per capita household health spending among elderly households was significantly higher than non-elderly households. The health expenditure is harmful for poorer households, casual labourer and households with elderly members.

Likewise, Brinda, et al. (2014) investigated the association of the determining factors (categorized into predisposing, enabling and need factors) with out-of-pocket health expenditures among the adult and older population in the United Republic of Tanzania using a cross sectional secondary data from the first round of Tanzania National Panel Survey (TZNPS), implemented by the National Bureau of Statistics of United Republic of Tanzania. The predisposing factors include age, gender, marital and occupation status variables; education, asset index as proxy measures for wealth were considered as enabling factors to OOP

health expenditures. The asset index was estimated using eighteen variables, which provided information on housing characteristics, type of water supply, sanitation in the household, and ownership of the household's durable assets. Obesity, presence of visual defects, hearing defects, limb defects, self-reported functional disabilities and psychological morbidity were included as need variables. To analyze the determinants of catastrophic health expenditure, the researchers used non-food expenditures of the household as a close measure for the household's capacity to pay. Then, estimated the share of OOP health expenditure in the household's non-food expenditure (E_j) to define catastrophic health expenditure using this model: $E_j = HE_j / NFE_j * 100$ where, HE_j is the household's average monthly OOP health expenditure; NFE_j denotes the household's average monthly non-food expenditure.

It was found that women of reproductive age had a significantly higher OOP expenditure than the older women. This result was consistent with the study of Maestad (2011) that explained the prevalence of high informal payments and increased need for health service utilization among younger women and their children. A higher prevalence of disabilities among elderly is known to be associated with increased OOP health expenditure in LMICs. Economic disadvantages related to the older peoples' disabilities can exacerbate their untreated medical illness, increase dependency and restrict their access to health services. Due to the absence of social security systems, the older people either suffer financial burden through OOP payments or remain disabled without seeking health care.

Amaya-Lara (2016) studied the factors affecting the probability of catastrophic healthcare spending using the data from the Quality of Life National Survey conducted in Columbia 2011. A probit model was estimated to determine the factors influencing the catastrophic healthcare spending. The study found that children and the elderly have a greater risk of health issues and require more medical care than the rest of the population, which influences the probability of the household incurring in catastrophic healthcare spending. In particular, households with members five years old or younger and/or members 65 years old or older have higher probability of incurring in catastrophic healthcare spending than households that have no members in those two age groups. Likewise, studies have found that households with a lower income level are more vulnerable to catastrophic healthcare spending.

Masiye and Kaonga (2016) carried out an analysis on the determinants of healthcare utilization and out-of-pocket payments in the context of free public primary healthcare in Zambia. The study employs a multilevel multiple logistic regression to model the determinants of an individual's choice of healthcare options following an illness and the two-part generalized linear model to magnitude of OOP expenditure related to a health provider. The analysis is based on a National Representative Healthcare Utilization and Expenditure Survey that was conducted in 2014. The study shows that people who reside in remote and rural areas generally live further from health facilities which increase their OOP payments through travel cost. A significant component of OOP payments for people residing in rural areas and remote settings is the cost of travel to access health services. Clearly, OOP payments increase with increasing remoteness. Further, the result shows that education of the household head is significantly associated with OOP health expenditure. A possible explanation for the positive association between education and the magnitude of OOP payments could be that better-educated individuals may have a tendency to choose better-quality, more costly healthcare options. Moreover, OOP payment is associated with household economic well-being; this means that when public health facilities run out of drugs, patients often have to buy drugs at pharmaceutical retail outlets.

Malik and Syed (2012) studied the determinants of OOP payments on healthcare in Pakistan in terms of social, economic, demographic and health variables using the data sets of Pakistan Household Integrated Economic Survey (HIES) and Pakistan Standard of Living Measurement (PSLM) Survey for the year 2004-2005. The study applies a multiple regression model for the determinants of OOP payments using the method of Ordinary Least Square (OLS). The study found out that household features like literate head and spouse, at least one obstetric delivery in last three years, unsafe water, unhygienic toilet and household belonging to Khyber Pukhtonkhwa (KPK) province were significant positive predictors of OOP payments. Households with male head, bricks used in housing construction, household with at least one child and no elderly, and head of household in a white collar profession were negative predictors of OOP payments.

Okello and Njeru (2015) explained that employment and education status of an individual or household tends to affect their OOP medical expenditures. An educated household (probably earning higher incomes and more likely to be employed) may make more effective use of modern medicine and is likely to incur large expenditures on self-medication and traditional therapies.

The study of Brinda, et al. (2014) also reveals that the rich have better living conditions and better health, thereby reducing their needs for OOP health expenditure. However, they are endowed with better economic resources, education, enhanced awareness towards the need for health care and the thresholds at which they access that service are correspondingly lower. On the contrary, the poor and those with low literacy are less likely to use health services, especially preventive services, leading to worse health outcomes and subsequently increased need for OOP expenditure. The need for OOP health expenditure that arises out of poor health determines the link between the economic inequality and inequities in the delivery of health care to people in LMICs. Gender inequality and unbalanced access to education additionally contribute and sustain health care inequities. Affordability remains a stronger determinant for OOP health expenditure than the valid need for essential health services.

Paez, et al. (2015) examined the prevalence of self-reported chronic conditions and out-of-pocket spending using the 2005 Medical Expenditure Panel Survey (MEPS) and made comparisons to previously published MEPS data. The study found that the prevalence of self-reported chronic conditions is increasing among not only the old-old but also people in midlife and earlier old age. The greatest growth occurred in the number of people affected by multiple chronic diseases, a group with sizable out-of-pocket spending. The result was consistent with their earlier paper using data from the 1996 Medical Expenditure Panel Survey (MEPS), which showed that the out-of-pocket spending, particularly drug costs, increased with the number of chronic diseases and was substantial for both the elderly and the non elderly.

Abegunde and Stanciole (2008) aimed to explore the evidence on how chronic diseases affect household healthcare expenditure, non-health consumption, labour (earned) income, and to demonstrate how transfers may provide some insurance against shocks from chronic diseases. The researchers developed a two-part Heckit model on household level data obtained from the Living Standard Measurement Surveys (LSMS) from Russia to control for nontrivial proportion of zeros in the dependent variables, skewed distribution of expenditure data and endogeneity. The results showed that chronic diseases are significantly associated with higher levels of household healthcare expenditure in Russia and productivity losses reflected by reduced labour supply and reduced household labour income. Non-healthcare expenditure also increased. Results suggested that households are able to insure non-health consumption against chronic diseases, possibly from transfers, which also increased. In addition, socioeconomic status indicators significantly explained the impact of chronic diseases on households. Insurance and higher average education in households were associated with higher healthcare expenditure. Household transfers were significant in Russia despite an appreciable level of insurance cover. The researchers conclude that households depend on informal coping mechanisms in the face of chronic diseases, irrespective of insurance cover.

A study conducted in Taiwan by Chu, et al. (2005) selected the data of the pre-NHI 1994 survey and the post-NHI 1996 survey to assess the impact of National Health Insurance (NHI) on household out-of-pocket medical care expenditures shortly after its implementation in 1995. The empirical model is specified below:

$$\ln(\text{Exp } i) = \beta_0 + \beta_1 \text{Income } i + \beta_2 \text{Region } i + \beta_3 \text{NHI } i + \beta_4 \text{Income } i / \text{NHI } i + \beta_5 \text{Region } i / \text{NHI } i + \beta_6 \text{Z } i + \varepsilon I$$

Exp *i* is out-of-pocket expenditures on health care by household *i*. For linearity in the equation, the dependent variable (Exp) is transferred into logarithm. Income *i* is a set of household income dummy variables. Region *i* is a set of regional dummy variables. NHI *i* indicates the national health insurance program. Income *i*/NHI *i* and Region *i*/NHI *i* are two groups of interactions of income and region and NHI. Z *i* represents a vector of socioeconomic and demographic characteristics of economic household head, which are marital status, sex, employed status, age, education level and family members.

The study revealed that an individual who was older, female, married, unemployed, better educated, richer, head of a larger family household, or living in the central and eastern areas was more likely to have greater household out-of-pocket medical expenditures. Moreover, NHI was found to have effectively reduced household out-of-pocket medical expenditures by 23.08%, particularly for more affluent households. With the implementation of NHI, lower and middle income quintiles had smaller decreases in out-of-pocket medical expenditure. NHI was also found to have reduced household out-of-pocket medical expenditures more for households in eastern Taiwan (.Chu, et al. 2005).

Finally, Suka, et al. (2009) examined the effect of annual health check-ups on medical expenditures in Japanese middle-aged workers using the medical expenditure data from a health insurance society with 38 affiliated companies in Japan. Eligible employees (1811 men and 787 women) aged 40 to 55 years, who received medical care in 2002 (baseline year) and 2006 (4 years later) were surveyed about the participation in health check-ups in 2003, 2004 and 2005. Results show that after adjusting for medical care use in the baseline year, the 4-year total (2003-2006) of medical expenditures was significantly lower in those who had more frequent health checkups for both genders. The 4-year change (from 2002 to 2006) of medical expenditures was inversely associated with the frequency of health check-ups, and this association was statistically significant for men.

IV. METHODOLOGY

The study utilized a cross sectional secondary data obtained from the 2013 Annual Poverty Indicators Survey (APIS) in the Philippines. It applied a multiple linear regression model to assess the effects of per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, availing of medical check up, family being located in an urban or rural area, unsafe water source and the availing of supplementary feeding program to per capita out of pocket health expenditure particularly on medical products, therapeutic gadgets and equipment of the 4Ps families in the Philippines.

The null hypothesis was tested at 5% level of significance stating that 4Ps families were no more likely to increase their per capita health expenditures on medical products, therapeutic gadgets and equipment when the :

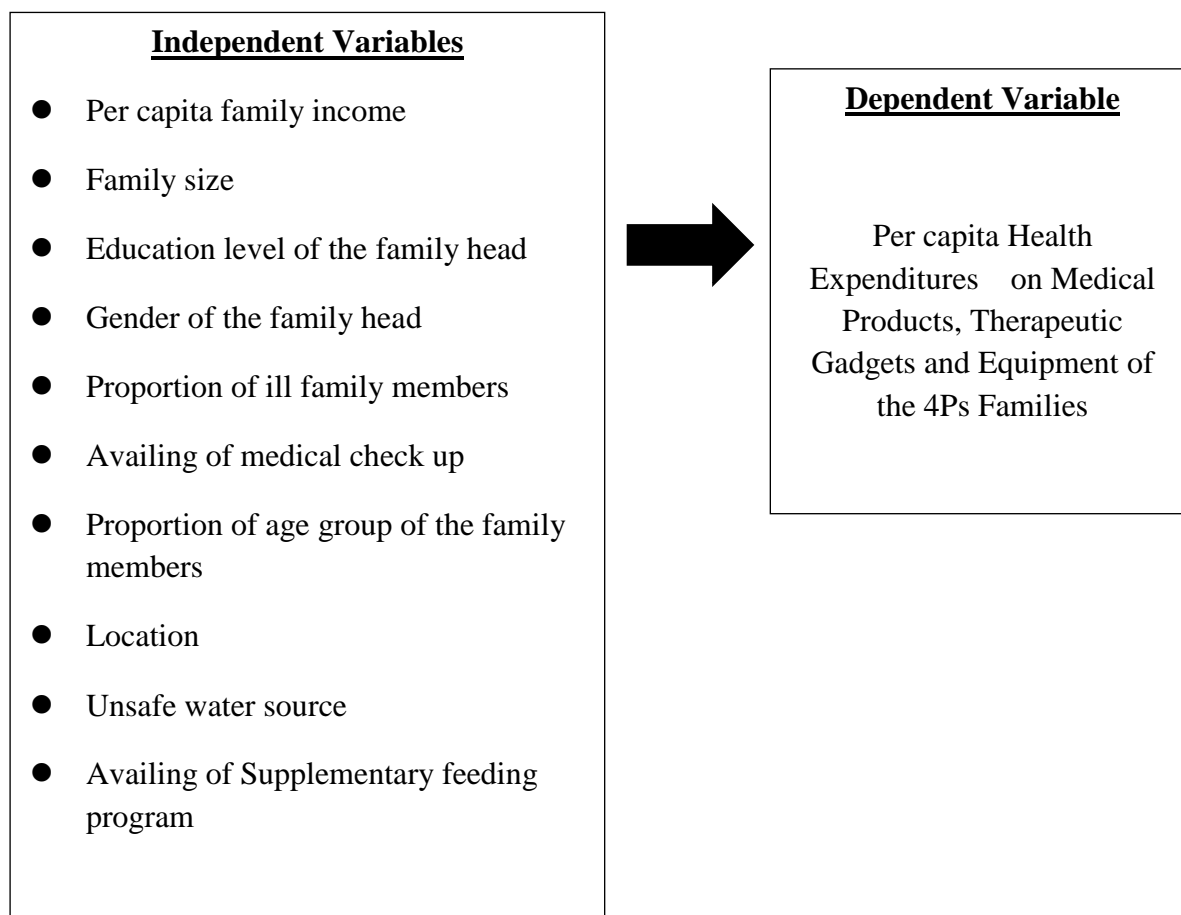
- a. Per capita family income is low;
- b. Family size is small;
- c. Family head has low education level;
- d. Family head is a male;
- e. Proportion of family with ill members is low;
- f. Family members have availed medical check up;
- g. Proportion of family members with 5 years old and below and 60 years old and above is low;
- h. Family is located in urban areas;
- i. Family has safe water supply; and
- j. Family avails supplementary feeding program .

The mathematical model was used to test the hypothesis is as follows:

$$OOPHE_i = \beta_0 + \beta_1 FI + \beta_2 FZ + \beta_3 EDUC + \beta_4 G + \beta_5 NIM + \beta_6 AMC + \beta_7 AG + \beta_8 L + \beta_9 USF + \beta_{10} USW + e_i$$

Where *OOPHE* is the Per capita health Expenditures, *FI* is the family income, *FZ* is the family size, *EDUC* is the educational attainment of the family head, *G* is the gender of the family head, *NIM* is the number of ill family members, *AMC* is the availing of medical check up, *AG* is the age group of the family members, *L* is the family being located in an urban or rural area, *USW* unsafe water source and the *ASF* is the availing of supplementary feeding program. The statistical software STATA13 was used

to test the data for multicollinearity and heteroskedasticity of the variables. The framework designed as shown below shows the existing relationship of the explanatory variables to per capita out-of-pocket medical products, therapeutic gadgets and equipment expenditures of the 4Ps household.



For a better understanding of the study the following terms were used and defined using the 2013 APIS report and or questionnaire:

4Ps families	Those that suffer from chronic poverty and falls within the priority ranking as determined by the National Household Targeting System of the Department of Social Welfare and Development. (Philippine Constitution). As used in this study, these families are those who belong to the bottom 30 percent of the total families in the income distribution, in descending order of the family per capita income (APIS 2013).
Availing of medical check-up	It refers to the availment of government social services such as medical check-up, hospitalization, vaccination, getting free medicines or other health services from public hospitals/ urban/rural health units (APIS 2013)
Availing of Supplementary Feeding Programs	It refers to any family members who availed the supplementary feeding program for the last six months (APIS 2013).
Age group of family members	As used in this study, it refers to the proportion of the age structure of the family members using these two (2) variables: family members with 5 yrs old or below and a family with 60 yrs old and above.
Gender of the family heads	It refers to the gender of the adult member of the family who is responsible for the care and

	organization of the family or who is regarded as such by the members of the family (APIS 2013). As used in this study, gender of the family head is presented by two dummy variables, one (1) if the family is headed by male and zero (0) if it is headed by female.
Proportion of ill family members	It refers to a percent of family members who are ill or injured during the past 6 months (APIS 2013).
Education level of the Family Head	It refers to the year level attained by the family head (APIS 2013). As used in the study, family head with elementary level was the baseline to measure the two (2) variables representing the following: family head with high school level and family head with college level.
Location	It refers to the family being located either in an urban or rural areas (APIS 2013). As used in this study, it is a dummy variable, 1 if the family lives in an urban places and 0 if it the family lives in rural areas.
Out-of- pocket health expenditures	It refers to family health expenditures on medical products, therapeutic gadgets and equipment whether purchased/paid for in cash or on credit on pharmaceutical products, pharmaceutical products for nutrition and or prevent diseases, other medical preparations, medical drugs and patent medicines, other medical products (clinical thermometer, adhesive and non-adhesive bandages, therapeutic appliances and equipment (APIS 2013).
Per capita family income	It refers to the family income per person is calculated by taking the total gross family income which includes primary income and receipts from other sources received by all family members for the past six months, as participants in any economic activity or as receipts of transfers, pensions or grants divided by the total number of family members living together (APIS 2013). As used in this study, it refers to the bottom 30 percent of the total families in the income distribution, in descending order of the family per capita income which was measured using three (3) variables representing the following: per capita income decile 1 (as the poorest), per capita family income decile 2 and per capita income decile 3.
Unsafe water source	As used in this study, it refers to a source of water which is not piped into dwelling.

V. RESULTS AND DISCUSSION

Tests have been conducted to find out the significant relationship between per capita out-of-pocket health expenditures and the per capita family income, education level of the family head, gender of the family head, proportion family with members, proportion of age group of the family members, availing of medical check up, location, unsafe water source and the availing of supplementary feeding program of the 4Ps families in the Philippines. The descriptive summary of all the variables are shown on table 1 below:

Table 1: Descriptive Statistics

Var.	Obs.	Mean	Std. Dev.
Pc_OOP Health Exp.	1852	23.77331	109.5453
pc_income_ decile 1	1852	0.3153348	0.4647746

pc_income_decile 2	1852	0.2516199	0.4340611
pc_income_decile 3	1852	0.1733261	0.3786312
head_male	1852	6.062635	1.967693
fsize	1852	0.8941685	0.307705
Proportion of 5 years old and below	1852	22.7157	24.36151
Proportion of 60 years old and above	1852	4.069166	11.04255
educ_head_3	1852	0.3288337	0.4699163
educ_head_4	1852	0.0410367	0.1984287
Unsafe water source	1852	36.55819	35.71347
Proportion of family with ill members	1852	0.8450324	0.3619715
Supplementary feeding program	1852	0.1052916	0.3070117
avail_med chk up	1852	0.5210583	0.4996913
urban_1	1852	0.1679266	0.373902

With 1852 observations, the mean value of the per capita out-of-pocket health expenditure is equal to 23.77. The per capita income decile 3 has the lower mean and lesser variation than per capita income deciles 1 and 2. With respect to age group, 23% percent of the total observations has family members with 5 years old and below while 4% has 60 years old and above. Also, 33% percent of the family head have reached in high school level and 4% are with college level. Meanwhile, 85% of the total 4Ps families have ill members while 52% of them are availing social services like medical check up. Finally, out of 1852 families, 17% are being located in urban areas in the Philippines.

Table 2 shown below illustrates the summary result of the relationship between the per capita OOP health expenditures as the dependent variable and the independent variables namely the per capita family income, family size, education level of the family head, gender of the family head, proportion of family with ill members, proportion of age group of the family members, location, availing of medical check up and supplementary feeding program. Likewise, the result shows that per capita family income, family size, family with male head, family with 60 years old and above, family head with high school completion and proportion of family with ill members are statistically significant in explaining the per capita OOP health expenditure of the 4Ps families.

Table 2: Regression Result

Pc_OOP health exp.	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
pc_income_decile 1	-25.63218	7.146253	-3.59	0.000	-39.64781	-11.61654
pc_income_decile 2	-24.87075	7.047163	-3.53	0.000	-38.69204	-11.04946
pc_income_decile 3	-23.53646	7.604231	-3.1	0.002	-38.45031	-8.622617
family size	-5.370943	1.31697	-4.08	0.000	-7.953859	-2.788028
head_male	-28.82951	7.957258	-3.62	0.000	-44.43573	-13.22329
prop_5or below of age	0.1147158	0.1771897	0.65	0.517	-0.2327987	0.4622302
prop_60and~e of age	2.207336	0.2259184	9.77	0.000	1.764252	2.65042
educ_head_HS	16.55827	5.344329	3.1	0.002	6.076674	27.03987
educ_head_College	2.756008	12.55819	0.22	0.826	-21.87383	27.38584
prop_ill members	0.2035528	0.0703363	2.89	0.004	0.0656054	0.3415002
Unsafe water source	-1.550135	6.976395	-0.22	0.824	-15.23263	12.13236
Supp. Feeding program	0.724883	7.989948	0.09	0.928	-14.94545	16.39522
Avail. med check up	7.13955	5.033252	1.42	0.156	-2.731947	17.01105
urban_1	4.447547	6.774658	0.66	0.512	-8.839293	17.73439
_cons	73.81946	12.91244	5.72	0.000	48.49485	99.14407

The analysis that the negative relationship of the per capita family income to the per capita OOP health expenditures indicates that for every increase in per capita income, OOP health expenditures decreases by 26 Php, 25 Php and 24 Php in income decile 1, 2 and 3, respectively. Brinda, et al. (2014) explained in their study that families who are poor and low literacy are less likely to use health services, especially preventive services, leading to worse health outcomes and subsequently increased the need for OOP expenditure. Unlike the rich who have better living conditions and better health, better economic resources, education and awareness towards the need for health care thereby reducing their needs for OOP health expenditure. Moreover,

based on the principle of Engle's curve, the result reveals that health expenditure on medical products, therapeutic gadgets and equipment is an inferior good for 4Ps families in the Philippines because as their per capita income increases, their OOP expenditure on health decreased.

The result that family size is negatively correlated with per capita OOP health expenditure is consistent with the study of Halliday and Park (2009). It was mentioned in their study that if household size is an adequate proxy for family support and family support is protective of one's health, then it is observed that larger households have fewer expenses on formal medical care *ceteris paribus*. Also, if household size is a proxy for family care, then this suggests that family care-giving substitutes for medical care obtained on the market. Furthermore, Hallmark and Park cited the study of Wallace (1996) that family caregivers may detect abnormalities in a patient's health before a condition progresses to an acute stage. Hence, early detection may prevent emergency department visits and hospital admissions may decrease a household's medical expenditures. Second, family support can create a positive emotional state for a patient and may reduce endocrine and immunologic responses that are known to be harmful to health. Finally, family support for a healthy lifestyle and behaviors may positively influence a patient's adherence to treatment regimens.

Family with male head is negatively associated with the per capita OOP health expenditure. It means that for every family with male head, their OOP health expenditures is lowered by 29 Php compared by a family with female head. According to Bin Chu, et al. (2005), male are less careful about health condition of the members in their family and possibly less likely to take them for medical care than females, hence, male household heads would not incur more household out-of-pocket medical expenditures than the female.

With regard to age group, the proportion of family members with 60 yrs old and above is positively related to per capita OOP health expenditure. This means that for every 10 percent increase of a family member with 60 yrs old and above, their per capita OOP health expenditures increases by 22 Php. Gupta, et al. (2017) explained that higher OOP health expenditure among elderly could be due to more occurrence of illness or multiple chronic conditions, which requires more medical care than the rest of the population.

A positive association between a family head with high school level and the per capita OOP health expenditures indicates that for every family with family head with high school level, their OOP health expenditures increases by 16 Php. Okello and Njeru (2015) explained that less educated household (probably earning lower incomes and more likely to be unemployed) may not use effective modern medicine and may likely to incur less expenditures on self-medication and traditional therapies.

The proportion of family with ill members is positively correlated with per capita OOP health expenditures. It shows that for every 10 percent additional ill family members, per capita OOP health expenditures increases by 2 Php. Masiye and Kaonga (2016) pointed out in their study that the positive association between OOP payment and the well being of the households could be explained by the fact that patients often buy drugs at pharmaceutical retail outlets when public health facilities run out of drugs.

However, it is worth mentioning that other variables, such family members with 5 yrs old and below, the family being located in an urban or rural area, unsafe water source, availing of medical check up and the availing of supplementary feeding program were not statistically significant in explaining the per capita OOP expenditure of the 4Ps families in the Philippines.

Summary of Findings

The empirical analysis of this study reveals that 4Ps families were no more likely to spend from out of their own pocket on health particularly on medical products, therapeutic gadgets and equipment, if their:

1. family income is high since having higher income means better living conditions, better health, better economic resources and awareness toward the need for health care;
2. family size is large with adequate support and protective care of one's health may become a substitute for medical care expenses;
3. family head is male since male is less concerned on the health condition of the family than females;
4. family head has low education level they may be earning lower income and more likely to be unemployed. Then, they may not use modern medicine.
5. family members without 60 years old and above have lesser possibility of occurring illness or multiple chronic conditions than family with 60 years old and above members. Thus, less amount is required to spend for medical care; and
6. family without ill members has lesser amount needed for medical care than family with healthy members.

CONCLUSION AND RECOMMENDATION

The study result shows that 4PS families per capita out-of-pocket health expenditure on medical products therapeutic gadgets and equipment was affected by their per capita family income, family size, male family head, proportion of age group with 60 years old and above, education level of the family head with high school level and the proportion of sick family members. Hence, policy makers may find a way to improve and implement a better public health services so that 4Ps families can get any health services they need without imposing additional financial burden on their families.

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