



Social health insurance in the Philippines: do the poor really benefit?

Salaheddine El Omari¹ · Mahmoud Karasneh¹

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Abstract

Developing countries have spent a tremendous amount of time and money on social health insurance programs to give the low-income population free access to health care services. Standard economic theory predicts that people use care services more frequently and regularly when they are free. In this paper, we show that providing free access to health services might not be enough to enhance the utilization of health care by indigents.

Keywords Social health insurance · Healthcare access · Health care utilization · Impact evaluation · Indigents · Philippines

JEL classification I13 · I15 · O11 · O53

1 Introduction

Social health insurance is one possible way of financing health care services. It aims to reduce health inequalities by offering low-income households free access to medical services. According to standard economic theory, social health insurance improves the use of medical care by reducing the cost of care for indigent patients (Trujillo et al. (2005)). This theory is confirmed in developed countries, as shown by Buchmueller et al. (2005); Hadley (2003), among others. However, in the context of developing countries, there is no consensus among economists that health insurance coverage improves the use of health care services by indigents. Some empirical studies have reported favorable and statistically significant effects of social health insurance on the use of health care by indigent members (Galarraga et al. (2010); Panpiemras et al. (2011); Wagstaff and Pradhan (2005), among others), while other studies do not show

✉ Salaheddine El Omari
selomari@qu.edu.qa

¹ Department of Finance and Economics, Qatar University, Doha, Qatar

any significant impact (Bauhoff et al. (2011); King et al. (2009); Thornton et al. (2010); Wagstaff and Moreno-Serra (2009); among others).

In recent years, there has been an increasing interest in social health insurance programs and high-quality impact evaluation (see, for example, Savedoff et al. (2006) and Simon and Barmeier (2010)). Giedion et al. (2013), in their review of research published in the past 15 years on the impact of health insurance programs in developing countries, indicate that approximately 40% of all reviewed studies resort to either multivariate analysis or simple mean comparisons. The empirical evidence based on these evaluation methods generally suggests a positive effect of participation in health insurance programs on the use of health care by low-income households (Makinen and Konaté (2005); Scheil-Adlung and Jütting (2006), among others). However, these methods might not be appropriate for identifying the causal effect of an insurance health program in the absence of randomization. Indeed, the group of participating members and that of non-participants are likely to be distinguished by characteristics that influence recourse to healthcare, such as age, education, income, and health conditions. Evaluating the impact of health insurance is, methodologically, a challenging endeavor. It requires the use of rigorous econometric methods to tackle different issues.

This paper evaluates the impact of the Philippine social health insurance program (hereafter PhilHealth) on the use of healthcare services by rural indigents by using a methodological protocol based on two econometric techniques: matching method and regression discontinuity design. The use of these two evaluation methods allowed us to evaluate rigorously this program and verify whether the results depend on the approach used.

The first method allowed us to match indigent participants in PhilHealth to similar non-participants, based on their propensity score. This score, which is the probability of an indigent household head being accepted into this program, was estimated using a probit model with the following explanatory variables: the age of the head of household, their gender, their education level, their household wealth, their health status, the household size, the distance to health centers, and the number of children who had died from diseases. The last four variables are introduced for the first time in relation to the existing literature.

Regression discontinuity design is infrequently used in economics as a source of identifying information in evaluating a program's effects. The major advantage of this method is that it bypasses many of the questions concerning model specification (Hahn et al. 2001). Knowing that the Philippine program of social health insurance requires that the dependent (child of the participating indigent) be under the age of 21 to profit from the advantages of the program, we have taken advantage of this eligibility condition to use this precise evaluation technique.

The paper is organized as follows. The first section provides a short description of the PhilHealth healthcare program. Section two sketches out the methodology used to evaluate the impact of this program on the use of health care by rural indigents. Section three presents the impact evaluation results. A final section expresses our conclusions and recommendations.

2 Philippine social health program

2.1 Description and objective

The Philippine Health Insurance Corporation was created in 1995 to implement universal health coverage in the Philippines. This new national health insurance program (PhilHealth) aims to ensure the best health outcomes for all, without any form of inequity, and to protect all families, especially the poor, marginalized, and vulnerable, against the prohibitive costs of health care. It has four membership categories:

- (i) Members of the formal economy, including employees in the government and private sectors, whose premium contribution payments are evenly shared by the employee and employer (1.25% each of payroll);
- (ii) Indigents or persons who have no visible source of income, or whose income is insufficient for the subsistence of the household, as identified by the Department of Social Welfare and Development, based on specific criteria set for this purpose. The annual premiums of selected beneficiaries are subsidized through a cost-sharing agreement between the national and local government units. In 2014, this category represented 49% of the total members covered by PhilHealth;
- (iii) Self-employed members whose income is derived purely from business or professional practice. Their contributions are based on household earnings and assets, which should not exceed 3% of their estimated monthly salaries; and
- (iv) Lifetime members or those former members who have reached the age of 60 and have paid at least 120 monthly contributions with PhilHealth prior to the semester of their retirement. Membership becomes free if one qualifies for both (Dayrit et al. (2018)).

Under each member category, the legal dependents of the principal member (spouse and all children below 21 years of age) have free access to health care services offered by PhilHealth. Table 1 provides a short overview of the background characteristics of PhilHealth members.

The health benefits package includes both inpatient and outpatient care, but is more inpatient-oriented (Jowett and Hsiao 2007). The benefits include room and board, professional healthcare services, diagnostics and other medical examination services, maternity care, use of surgical or medical equipment, prescription drugs and biologicals, and personal preventive services.

2.2 Access to health Care Services for Indigents

In 1997, PhilHealth introduced a special Indigent Program for needy families, in which premiums are supported by government subsidies, co-financed by the national and local governments. The number of indigent families covered by this program increased from 2904 in 1997 to 14.7 M in 2014. The medical coverage of indigent families has surely expanded over time, but access to accredited healthcare services remains a challenge for poor Filipinos. Based on the 2013 National Demographic and Health Survey Report, the two major obstacles preventing households from visiting healthcare

Table 1 Covered members and dependents

Sector	Members	Dependents	Beneficiaries
Members in the Formal Economy			
- Private	12,465,283	10,839,327	23,304,610
- Government	2,102,361	3,783,503	5,885,864
- Household help	67,598	49,952	117,550
- Enterprise owners and family drivers	946	1321	2267
Members in the informal economy			
- Migrant worker	659,311	951,543	1,610,854
- Informal sector	2,177,414	3,349,326	5,526,740
- Self-earning individual	409,751	586,676	996,427
- Organized group and others	14,335	19,855	34,190
Indigents	14,641,685	28,844,119	43,485,804
Sponsored members	1,217,941	1,560,458	2,778,399
Senior citizens	6,245,583	1,328,749	7,574,332
Overseas filipino workers	1,229,641	854,183	2,083,824
Total	41,231,849	52,169,012	93,400,861

Source: Department of corporate planning, PhilHealth (Philippine Health Insurance Corporation 2014)

facilities are (i) a lack of financial resources and (ii) the geographic remoteness of facilities, especially in poor regions.

Indigents are often located great distances from healthcare facilities and face long travel times to obtain care services. In the survey mentioned above, persons who visited a healthcare facility in the 30 days prior to the survey's administration were asked how long it took to travel to the facility. Table 2 shows the average travel time to healthcare facilities. Overall, the average travel time was 34 min. Among regions, the poorest region in the Philippines (ARMM) has the longest travel time (61 min), while the richest one (National Capital Region) has the shortest travel time (25 min). As expected, the average travel time is longer for persons in rural areas (38 min) as compared to those in urban areas (28 min). In addition, women were asked what obstacles prevent them from obtaining medical services when they are sick. The reasons they gave were as follows: getting permission to go for treatment, getting money for treatment, distance to healthcare facilities, and not wanting to go alone. Table 3 shows that 27% of women stated that distance from a health facility is a serious obstacle. Rural women (65%) are more likely than urban women (51%) to report problems in accessing healthcare services. Looking at economic status, the survey shows that women from the lowest wealth quintile (52%) were more likely than those from the highest wealth quintile (13%) to say that remoteness of healthcare facilities prevents them from seeking health services.

In the same survey, 74% of indigent households reported that getting money for treatment was a struggle (National Statistics Office 2013). In the Philippines, out-of-pocket health expenditures increased by 150% (real) from 2000 to 2012 (Family Income and Expenditure Surveys 2012). The main driver of this increase is the cost of medicines, with the larger share of medicines in total health expenditures among the

Table 2 Average travel time to health facility visited, Philippines 2013

Background characteristic	Average travel time in minutes	Number
Residence		
Urban	27.5	3081
Rural	37.9	4339
Region		
National Capital Region (4.1)	24.5	842
Cordillera Admin Region (22.6)	49.6	162
I - Ilocos Region (18.8)	20.7	443
II - Cagayan Valley (17.6)	47.3	318
III - Central Luzon (10.4)	31.8	828
IVA – CALABARZON (12.2)	29.9	938
IVB – MIMAROPA (24.8)	43.7	255
V – Bicol (39.5)	26.5	625
VI - Western Visayas (24.4)	35.4	628
VII - Central Visayas (29.1)	45.1	459
VIII - Eastern Visayas (41.2)	32.2	376
IX - Zamboanga Peninsula (37.5)	33.4	292
X - Northern Mindanao (38.4)	29.1	320
XI – Davao (23.5)	48.2	260
XII – SOCCSKSARGEN (38.2)	36.7	377
XIII – Caraga (39.5)	33.3	164
ARMM (58.9)	60.9	132

Numbers between parentheses represent the poverty incidence among population (%) by region (Philippine Statistics Authority 2014)

poor (76%) as compared to the rich (58%) (Bredenkamp and Buisman 2016). The high cost of medicines prevents indigents from seeking medical care even when they suspect it may be necessary and drives them to catastrophic spending. A second problem that adds to this obstacle is the low availability of medicines. Despite the enactment of two crucial acts, the Cheaper and Quality Medicines Act of 2008 and the Food and Drug Administration Act of 2009, extreme variations in the procurement of medicines were reported at both the Department of Health's hospitals and local government units (World Bank 2011).

3 Methodology and data

3.1 Data

The data used in this study were collected in the 2013 Philippines National Demographic and Health Survey (NDHS) conducted by the Philippine Statistics Authority (PSA) and sponsored by the United States Agency for International Development (USAID). This survey covered a national sample of approximately 15,000 households

Table 3 Remoteness and access to healthcare facilities. Percentage of women who consider the remoteness of healthcare facilities as a serious problem in accessing healthcare services when they are sick, according to background characteristics

Background characteristic	Distance to health facility	Number of women
Residence		
Urban	17.9	8585
Rural	38.1	7570
Region		
National Capital Region	15.4	2924
Cordillera Admin Region	27.7	252
I - Ilocos Region	37.5	691
II - Cagayan Valley	33.9	550
III - Central Luzon	24.1	1720
IVA - CALABARZON	18.9	2293
IVB - MIMAROPA	42.2	372
V - Bicol	34.7	798
VI - Western Visayas	30.0	996
VII - Central Visayas	25.5	1030
VIII - Eastern Visayas	24.5	571
IX - Zamboanga Peninsula	38.5	725
X - Northern Mindanao	33.3	697
XI - Davao	28.2	893
XII - SOCCSKSARGEN	35.3	744
XIII - Caraga	34.2	435
ARMM	63.9	465
Wealth quintile		
Poorest	51.7	2620
Poorer	34.9	2886
Middle	26.6	3199
Richer	19.4	3572
Richest	13.2	3878
Total	27.4	16,155

Source: 2013 Philippines National Demographic and Health Survey Report

and allowed for the collection of information about 67,429 household members. The database used by our study is available on the internet (<http://dhsprogram.com/data/available-datasets.cfm>). The characteristics of our sample are reported in Table 4.

3.2 Methodology

The main objective of our study is to identify differences in health-related outcomes between indigents with insurance and those without. To achieve this aim, we applied a

Table 4 Descriptive statistics for the two groups studied

Group Characteristics	Covered households	Non-covered households
Number of households	6304	6341
Sex of head of household	73% are male	49% are male
Age of head of household	43.3	42
Education of head of household (Years of schooling)	5.58	5.65

Source: Author's calculations

methodological approach based on the use of two semi-parametric methods, namely matching and regression discontinuity design (RDD).

3.2.1 Matching method

Every impact evaluation method must overcome the fundamental evaluation problem and address the possible occurrence of selection bias. To address the selection problem, Rosenbaum and Rubin (1983) propose a feasible method based on the concept of propensity score and its properties. Their idea is to compare the treated and the non-treated units in an observational study or quasi-experiment.

Propensity score determination The first step in propensity score matching is to use a probit model to estimate the probability of an indigent's exposure to PhilHealth, conditional on a set of observable characteristics that may affect participation in this program. Given that the national government cannot afford to sponsor all needy people, priority is given to sick, older, and disabled indigents. These eligibility criteria were used to estimate three probit models explaining the involvement of indigents in the PhilHealth insurance program. To control the effect of the region's wealth on the participation of indigents in this program, we incorporated, into our three models, 17 dichotomous variables representing different administrative regions of the Philippines.

These models are shown in Table 5. Of the three estimated models, the third one has been held for the following reasons. First, it presents a large number of significant coefficients (15 versus 6 for the other two models). Second, it gives us an acceptable value of R^2 (55% against 11% for the second model). Finally, it allows us to acquire the number of observations needed for more representative and accurate results (4820 versus 3006 for the first model).

The explanatory variables included in the selected model are the sex of the head of household, their age, their educational level, their socioeconomic status (measured indirectly by the ownership of certain equipment, such as a television, a motorcycle, a certain type of toilet facilities, or a boat), the time the household requires to obtain drinking water, the health status of the household head, the distance from the household to healthcare facilities, the household size, and the number of children who had died from diseases. To the best of our knowledge, the last four variables have not been incorporated into previous studies. Given the lack of direct data on the health condition of indigents, we considered their use of traditional medicine as a good proxy for their health status.

Table 5 Different models explaining the participation of rural indigents in PhilHealth program

Dependent variable Independent variables	Participation or lack of participation in PhilHealth		
	Estimated Coefficients (Model 1)	Estimated Coefficients (Model 2)	Estimated Coefficients (Model 3)
Sex of head of household	0.047 (5.21)***	0.035 (4.94)***	0.427 (8.25)***
Age of head of household	0.000 (0.90)	0.000 (1.39)	0.003 (2.87)**
Education level of head of household			0.011 (1.44)
Telephone ownership		0.006 (0.33)	-0.027 (1.75)*
Motorcycle ownership		-0.000 (0.03)	-0.011 (-1.66)*
Time to obtain drinking water	0.011 (2.71)**	0.003 (2.71)**	0.01 (2.22)**
Television ownership	0.003 (0.23)		-0.004 (-1.67)*
Bicycle ownership	-0.010 (0.87)	-0.005 (0.68)	-0.004 (-0.60)
Type of toilet facilities	-0.002 (2.63)***	-0.001 (3.22)***	-0.002 (-4.86)***
Boat ownership	-0.042 (2.32)**	-0.026 (2.89)***	-0.027 (-3.18)**
Use of traditional medicine	0.006 (0.27)	0.016 (1.67)*	0.002 (2.98)***
Presence of medical history			0.050 (2.86)***
Number of household members	0.005 (2.64)***	0.003 (2.90)***	0.002 (2.72)***
Number of children killed by diseases			0.138 (3.54)***
Access to health centers			-0.002 (3.37)
Region	0.002 (3.52)**	0.001 (3.11)**	0.002 (3.42)**
Adjusted R-squared	0.2110	0.1140	0.5551
Number of observations	3006	4650	4820

Statistical significance: * at 10%, ** at 5% and *** at 1%. Numbers in parentheses are the calculated “z” values

Matching techniques Once the propensity score of each rural indigent (whether participating in the PhilHealth program or not) was estimated, the next step was to select the matched samples by using matching algorithms. As recommended by Stuart and Rubin (2007) and for the sake of preciseness, we attempted to employ the four most

common matching algorithms used in impact evaluation studies. These include nearest neighbor matching, radius matching, kernel matching, and stratification matching.

3.2.2 Regression discontinuity design

The PhilHealth program requires dependents of indigent members to be younger than 21 so that they can benefit from the medical coverage. We exploited this discontinuity to apply the regression discontinuity design (RDD).

This method consists of comparing the consumption of health care services between dependents just above and below the age of 21 years. The regression discontinuity model used to evaluate the impact of this program is as follows:

$$Y = \alpha + \beta_1 T + \beta_2 X + \varepsilon \quad (1)$$

Where “Y” is a discontinuous dependent variable representing the consumption of care. This variable takes the value of 1 if the dependent had consumed health care services during the 12 months preceding the survey and 0 otherwise. “T” is a discontinuous explanatory variable representing PhilHealth’s medical coverage, which takes the value of 1 if the dependent is covered and 0 otherwise. “X”, called the selection variable, represents the age of the dependent. ε is the usual error term.

From our regression discontinuity model, we can write:

- For dependents aged under 21 years:

$$E(Y | X = 21^-) = \beta_0 + \beta_1 + (\beta_2 * 21^-) + E(\varepsilon | X = 21^-) \quad (2)$$

- For dependents aged above 21 years:

$$E(Y | X = 21^+) = \beta_0 + (\beta_2 * 21^+) + E(\varepsilon | X = 21^+) \quad (3)$$

where E denotes the expectation operator.

Under the assumption of similarity between the two groups of dependents, the difference between the two entities (Bredenkamp and Buisman 2016) and (Buchmueller et al. 2005) gives us the effect of medical coverage on dependents aged 20 years:

$$E(Y | X = 21^-) - E(Y | X = 21^+) = \beta_1 \quad (4)$$

Consequently, a simple statistical test on the significance of the coefficient β_1 is enough to verify whether the PhilHealth indigent program had an impact on the utilization of healthcare services by dependents aged 20 years.

4 Impact evaluation results

4.1 Impact of PhilHealth indigent program: A matching approach

Based on the propensity scores estimated using the selected model, we matched rural indigent participants with a control group composed of rural indigents who are not covered by the PhilHealth program. By comparing the use of healthcare services by these two groups, we evaluated the impact of this program on the participating households.

4.1.1 Effects on heads of participating indigent households

Impact on healthcare utilization As shown in Table 6, the four matching techniques show that there is no significant difference between the treatment group and the control group in the use of healthcare services. This means that the PhilHealth program did not have a positive impact on the consumption of medical care by the heads of indigent households. These findings are consistent with the results of Yu et al. (2010); Wagstaff (2010); King et al. (2009); and Thornton et al. (2010), which show that having medical insurance does not increase the use of healthcare services. In contrast, Galarraga et al. (2010) found positive effects of Seguro Popular health insurance on the consumption of health care by Mexican indigents.

Given that the four matching methods gave the same results for all the impacts examined, we limit ourselves, in the remaining elements of our analysis, to presenting only the results procured using the Kernel-matching technique.

Table 6 Propensity-score-based impact estimates of PhilHealth on use of health care by heads of participating households

Matching method	Treated group size	Control group size	Impact estimate	Standard deviation estimated by bootstrapping method* (N = 100)	t - value
Nearest neighbor matching	2219	2206	0.021	0.062	0.330
Radius matching (r = 0.0001)	2002	2029	0.060	0.052	1.151
Kernel matching	2219	2322	0.044	0.036	1.237
Stratification	2218	2323	0.008	0.032	0.252

*To determine the statistical significance of the treatment effect, the standard error may be biased because the estimated variance of the treatment effect would include the variance due to the estimation of the propensity score. One way to overcome this problem is to use bootstrapping

Impact on perception of diseases In health care, being a well-informed consumer is essential to promoting positive results. When indigents have poor health literacy, they do not look for medical services when needed, despite the presence of health coverage. This part aims to evaluate the PhilHealth program's impact on indigents' knowledge about the most common diseases in the Philippines.

The household heads' answers to some questions in the survey on malaria, dengue, leprosy, and AIDS/HIV allowed us to assess the impact of the PhilHealth program on their knowledge about these diseases. Table 7 shows that this program had no positive effect on indigents' perception of the diseases mentioned above. Limited health literacy is correlated with low levels of education, but the level of health literacy is exacerbated by a lack of health education strategy and awareness within the policy pursued by the Philippine Health Insurance Corporation. Because of a lack of awareness, indigents often visit healthcare facilities only when their diseases have reached an advanced stage.

4.1.2 Impacts on indigent women

Given that we did not have accurate data on the enrollment dates of indigent rural households in the PhilHealth program, our impact analysis of this program on pregnant women was limited to the most recent pregnancies, i.e., those that took place in 2012. By doing this, we had more certainty about the medical coverage for indigent women during pregnancy and childbirth. In this part, we assess the following impacts.

Table 7 Propensity-score-based impact estimates of PhilHealth on perception of diseases by heads of participating households

	Treated group Size	Control group Size	Impact estimate	Standard deviation estimated by bootstrapping method (N = 100)	t - value
Questions asked:					
Is there a cure for leprosy?	4180	4323	0.008	0.032	0.252
Is there a cure for dengue?	4180	4323	0.014	0.023	0.609
Can dengue disease be prevented?	4180	4323	0.022	0.034	0.647
Is malaria contagious or not?	4180	4323	0.098	0.072	1.367
Is malaria disease transmissible via mosquitoes?	4180	4323	0.008	0.032	0.252
Can we prevent malaria disease?	4180	4323	0.108	0.111	0.973
Is malaria treatable?	4180	4323	0.203	0.192	1.057
Can we protect ourselves against sexual diseases?	4180	4323	0.214	0.172	1.244
Is AIDS sexually transmissible?	4180	4323	0.069	0.051	1.353

Prenatal care The results presented in Table 8 show that the PhilHealth program did not have a positive impact on the use of prenatal care by indigent women. Although there is no significant difference between the two groups of matched women in terms of the consumption of prenatal care, the results show that the needy pregnant women covered by this program sought prenatal care earlier than did the non-participant indigent women. Regarding prenatal care, the results of the literature are mixed, with essential differences in outcomes across countries and research designs. Our findings are in line with those of Johar (2009), who found an increase in the use of contraceptives among indigent women covered by the Indonesian health insurance but no effect on the consumption of other services. In contrast, Smith and Sulzbach (2008) found that health insurance schemes increased the utilization of prenatal services in three West African countries (Senegal, Mali, and Ghana).

Childbirth, postnatal care, and vaccination Table 8 shows that the indigent women covered by PhilHealth had more childbirths assisted by health professionals than did those not covered by this program. This mobilization of pregnant women in search of assisted deliveries might be motivated by the high maternal mortality rate in the Philippines. Based on UNICEF's State of the World's Children 2013 report, about 3000 Filipino mothers died from childbirth out of 2.4 million deliveries (one of the highest rates in Asia). This result is consistent with that of Díaz and Jaramillo (2009), who evaluated the impacts of Peru's healthcare program and found a positive effect of this program on the number of assisted deliveries. When it comes to postnatal care, Table 8 shows that there is no statistically significant difference between the two groups of indigent women. As regards vaccination, the matching results reported in Table 9 show that there is no significant difference in immunization of children born in early 2012 between the two groups of indigent women, and this is true for all vaccines. This is partly due to the national vaccination campaign launched by the Philippine Department of Health in partnership with the World Health Organization between 2012 and 2013. This campaign has reached between 65% and 80% of Filipino children, according to the national survey conducted by the Philippine Department of Health in 2013. This result is consistent with that of Pande and Yazbeck (2003), who found that rural Indian children from

Table 8 Propensity-score-based impact estimates OF PhilHealth on use of medical services by participating women

	Treated group size	Control group size	Average effect of treatment	Standard deviation estimated by bootstrapping method	t-value
Prenatal care	1807	1841	0.085	0.109	0.778
Time prior to prenatal diagnosis	1807	1841	-0.324	0.145	-2.234
Professional assistance during delivery	1807	1841	0.234	0.074	3.161
Postnatal check-up	1807	1841	0.093	0.156	0.596

Table 9 Propensity-score-based impact estimates of PhilHealth on vaccination of children of participating women

Vaccine	Treated group size	Control group size	Average effect of treatment	Standard deviation estimated by bootstrapping method	t-value
BCG	1807	1841	0.094	0.244	0.385
DPT1	1807	1841	0.119	0.086	1.383
Polio1	1807	1841	0.184	0.113	1.628
DPT2	1807	1841	0.103	0.113	0.911
DPT3	1807	1841	0.149	0.156	0.955
Polio3	1807	1841	0.112	0.137	0.818
Measles	1807	1841	0.103	0.145	0.710

indigent households are more likely than those from wealthy families to receive no vaccinations, even though immunization is free.

4.2 Impact of the PhilHealth indigent program: A discontinuity regression design

To overcome the weaknesses of the matching method, the results of which depend mainly on the model used to estimate the propensity score, we completed our analysis of impacts by using the discontinuity regression design, which is much more robust and accurate.

This method consists of comparing the consumption of healthcare services between dependents just above and below the age of 21 years. To this end, the indigent dependents were divided into two groups. The first group includes dependents between the ages of 16 and 20, and the second one comprises those between the ages of 21 and 25. This method assumes a reasonable similarity between the two groups of dependents. To verify this hypothesis, we compared the two groups mentioned above according to four criteria: gender, level of education, state of health, and socioeconomic condition. As presented in Table 10, the test for differences between the means of the two groups shows that there is no significant difference between them for all the selected criteria.

Upon verifying the hypothesis regarding the similarity between the two groups, we estimated the regression model described in the methodology section. As shown in Table 11, the significance test indicates that the coefficient β_1 is not significant, which means that the medical coverage offered by PhilHealth did not have a positive effect on the use of healthcare services by indigent dependents aged 20 years. This finding confirms the results observed among indigent household heads.

For this method, we limited our evaluation to the impact of the PhilHealth program on the use of medical services by dependents aged 20 years. This section does not evaluate the other effects assessed through the use of the matching method for the following reasons. First, for the impact of this program on the knowledge of diseases, we considered that this analysis would not be relevant, given that the covered and uncovered dependents who belong to the same household exchange knowledge and information. This exchange makes any comparison of the two groups of dependents

Table 10 Descriptive statistics for two groups of dependents

Characteristics	Group of dependents aged between 16 and 20 years (Covered)	Group of dependents aged between 21 and 25 years (Non-covered)	<i>p</i> value (Difference of means test)
Number of dependents	8433	8387	–
Sex	65% are male	73% are male	0.811
Number of years of schooling	8.64	8.96	0.141
Health status:			
Dependents who had used traditional health care in the 12 months preceding the survey	32%	30%	0.912
Dependents who had used alternative health care in the 12 months preceding the survey	96%	94%	0.973
Proportion of smokers	12%	9%	0.814
Socioeconomic status:			
Time spent collecting source water (number of minutes per week)	180	178	0.995
Access to electricity	43%	53%	0.137
Television ownership	20%	18%	0.812
Telephone ownership	8%	12%	0.621
Radio ownership	57%	63%	0.619
Refrigerator ownership	2%	4%	0.811
Tractor ownership	0%	1%	0.971
Boat ownership	1%	4%	0.617

Source: 2013 Philippines National Demographic and Health Survey Report

difficult. In addition, given that this program started in 2000, there might be some dependents over the age of 21 who have already benefited from it. Second, regarding the impact of this program on vaccinations, we could not assess this impact among the young dependents because the immunization database covered only children under five years of age. Finally, we did not evaluate the effect of PhilHealth on the consumption of medical services by pregnant women aged 21 or younger because no data were available on pregnant dependents.

The results obtained from the two methods show that the PhilHealth indigent program had no impact on either the heads of indigent households or their dependents

Table 11 Discontinuity-regression-based impact estimates of PhilHealth on indigent dependents

Dependent variable (Y): Use of health services in the 12 months preceding the survey.	Coefficients (β_1 and β_2)	Standard deviation	Observed value of “z”
Independent variables:			
Age (X1)	−0.029 (β_2)	0.016	−1.82
Medical coverage (T)	0.135 (β_1)	0.084	1.61

aged 20 years. There are several plausible explanations for this finding. First, the indigent members are not well informed about their rights to free access to health care offered by health centers accredited by this program. This is due to the absence of information and awareness-raising actions within PhilHealth's policy. Indeed, 72% of indigents interviewed in the 2013 National Demographic and Health Survey said that they did not have sufficient information about the benefits offered by this program as well as the accredited health centers. Second, as highlighted earlier in Subsection 2.2, remoteness from health care services is one of the real obstacles preventing Filipino indigents from seeking care or prevention services. Third, the scarcity of medicines in health centers and their relatively high prices discourage indigents from seeking medical help in the event of illness, as discussed earlier in Subsection 2.2. The high cost of medicines not only discourages patients from utilizing appropriate care, but also drives patients to incur catastrophic payments and impoverishing health expenditures (Bredenkamp and Buisman 2016). Finally, the presence of very popular and less expensive traditional medicine practices makes healthcare centers less attractive for indigents seeking care and treatment. The above-mentioned survey reports that 38% of the interviewed indigent households had used herbs for treatment in the three months prior to the survey interview.

5 Conclusion

In this paper, we evaluate the social health insurance program's success in reaching the most vulnerable groups of the population in rural and remote areas in the Philippines. For this purpose, we adopted a methodological protocol based on two rigorous micro-econometric techniques: the matching method and regression discontinuity design. The results obtained show that this program, aimed especially at helping needy families, has completely missed its target. The participating indigent households have attended healthcare facilities only for deliveries assisted by health professionals, whereas other types of care did not attract this segment of the population. This clearly demonstrates that, in the Philippine context, the provision of free access to health services might not be enough to enhance the utilization of health care by indigent families. Consequently, additional accompanying measures are needed to improve the effectiveness, efficiency, and equity of the national health insurance program in a manner that is felt by indigent Filipinos.

First and foremost is the promotion of community-based care services by investing in the construction of health centers at the village level or by organizing regular and frequent visits or caravans to help indigent people overcome the cost and transportation barriers that prevent them from participating in this health insurance program and benefiting from its benefits. Second, efforts must be made to provide all indigent members with clear, easy-to-understand, and detailed information about the full range of benefits offered by the Philippine Health Insurance Corporation. In addition, urgent and exceptional action is required at national, regional, and local levels to plan and implement health campaigns to raise awareness among indigents of common diseases and the importance of seeking timely healthcare services from appropriate providers. Finally, logistic and legislative measures must be in place to implement free medicine programs for indigent patients in poor and remote areas to enable these patients to access badly-needed medicines.

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