



The Impact of Health Subsidy on Health Care Utilization in Indonesia

Renosa Tosca Zamaro¹

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¹National Graduate Institute for Policy Studies, Tokyo, renosa.tosca@kemenkeu.go.id

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Abstract

Equal opportunity and access to health care services regardless of one's socio-economic background is important for health equity. To achieve this, the Indonesian government introduced a national health insurance program named Jaminan Kesehatan Nasional in 2014 and provided insurance payment subsidies for poor people. This study evaluates the health subsidy policy's impact on the utilization of different kind of health care facilities, both public and private. Two waves of Indonesian socio-economic surveys, namely 2013 and 2018, and two analysis methods, namely logistic regression, and difference-in-differences, were applied in this study. The results show that in first-level health care facilities, the health subsidy improves the probability of outpatient visits in public health centers and polyclinics but decreases the probability of outpatient visits in medical practices. Then, in secondary-level health care facilities, the health subsidy was found to increase the likelihood of outpatient visits in public hospitals; however, it lowers the probability of outpatient visits in private hospitals.

Keywords : National health insurance, health care utilization, Indonesia, health subsidy, impact evaluation.

Abstrak

Kesempatan dan akses yang adil untuk mendapatkan layanan kesehatan bagi seluruh masyarakat terlepas dari latar belakang sosial ekonomi merupakan hal yang penting untuk menciptakan pemerataan kesehatan pada suatu negara. Untuk mencapai hal tersebut, pemerintah Indonesia memperkenalkan program jaminan kesehatan nasional bernama Jaminan Kesehatan Nasional pada tahun 2014 dan memberikan subsidi premi asuransi bagi masyarakat miskin. Studi ini bertujuan untuk mengevaluasi dampak kebijakan subsidi kesehatan terhadap pemanfaatan berbagai jenis fasilitas pelayanan kesehatan, baik publik maupun swasta. Penelitian ini menggunakan dua gelombang survei sosial ekonomi Indonesia (SUSENAS), yaitu 2013 dan 2018, dan mengimplementasikan dua metode analisis, yaitu regresi logistik, dan *difference-in-differences*. Hasil analisis menunjukkan bahwa pada fasilitas pelayanan kesehatan tingkat pertama, subsidi premi JKN bagi masyarakat miskin dapat meningkatkan kemungkinan kunjungan rawat jalan di puskesmas dan poliklinik, tetapi menurunkan kemungkinan kunjungan rawat jalan pada fasilitas praktek tenaga medis. Kemudian, pada fasilitas pelayanan kesehatan tingkat lanjut, subsidi kesehatan dapat

meningkatkan kemungkinan kunjungan rawat jalan di rumah sakit umum, namun menurunkan kemungkinan kunjungan rawat jalan di rumah sakit swasta.

Kata kunci: asuransi kesehatan nasional, utilisasi layanan kesehatan, Indonesia, subsidi jaminan kesehatan, model evaluasi dampak

1. INTRODUCTION

Health equity is an important aspect in increasing a nation's health quality. By achieving health equity, everyone in the society will have the same and fair opportunity to access health care programs, regardless of their gender, ethnicity, or wealth (Braveman, 2006). Therefore, it is important for policy makers to aim for reducing health disparity.

Considering the supply and demand of health services, the factors that affect access are geographical accessibility, the responsiveness of health service providers or acceptability and availability of adequate health care for the patients, and financial accessibility (Peters et al., 2008). In low middle-income countries in Asia, economic conditions constitute a vital factor for health equity, because the people mainly depend on out-of-pocket payment for health care services, resulting in wealthier people obtaining better health care while the less economically advantaged group may be left without treatment because they cannot afford the costs (O'Donnell et al., 2008). Moreover, a wider gap between the rich and the poor exists in rural areas (Mulyanto et al., 2019; Tzeng et al., 2018).

Governments may implement public health insurance programs in an effort to cut the out-of-pocket health care costs and thereby increase equity in health care utilization; however, studies in China and Vietnam have obtained mixed results regarding the same policy (Wagstaff, 2010; Wagstaff et al., 2009). Wagstaff et al. (2009) found that the partial subsidy for the poor—where the poor still have to pay a small amount of contribution—in China that was implemented in 2003 could improve both the number of outpatient and inpatient visits. However, Wagstaff (2010) found that the health insurance program for the poor in Vietnam that was introduced in 2003 did not have any significant effect on health care utilization.

The first step to achieving universal health insurance in Indonesia was taken in 2005 with the introduction of social health care insurance for the poor (*Askeskin/Asuransi Kesehatan untuk Keluarga Miskin*). The program was later replaced by *Jaminan Kesehatan Masyarakat/JAMKESMAS* in 2008, which covered the poor and near-poor. Both programs were fully funded by the government. In 2014, the government introduced national health insurance (*Jaminan Kesehatan Nasional/JKN*) as the universal program for all Indonesian citizens.

A 2005 study on the fully subsidized insurance program for the poor in Indonesia found that it could increase the number of monthly outgoing patients (Sparrow et al., 2013). However, at the time, Indonesia did not have a universal health insurance program that covered all the citizens. Later, Erlangga et al. (2019), using the Indonesian household survey data from the year 2014, found that, after the government of Indonesia introduced the national health insurance program in 2014, the number of outpatient visits was greater for the wealthier participants who paid insurance premium than the poor or fully subsidized participants.

Therefore, this study explores the longer effect of the subsidized health insurance program in Indonesia until 2018. In 2005, *Askeskin* only covered the poor people (i.e., people living below the poverty line) although many non-poor Indonesian people were left uninsured. This created less competition in utilizing the district public health care facilities because, after the introduction of the JKN program, the participants, including non-poor people, had to first go to the primary health care facilities before they could receive treatments at the secondary health care facilities. *Dewan Jaminan Sosial Nasional* and *BPJS Kesehatan* (2020) reported that the national ratio of public health centers for every 100,000 beneficiaries had decreased from seven in 2014 to five in 2018. This declining ratio will only create more rivalry in receiving treatments at health care facilities. Consequently, it may become a handicap to receive treatments and reduce the utilization of the health insurance program.

The present research aimed to identify the impact of the fully subsidized health care insurance program on promoting health care utilization in formal medical facilities in Indonesia. Firstly, this research will evaluate the impact of the health care subsidy on the utilization of first-level medical facilities. Secondly, this research will evaluate the impact of the health care subsidy on the utilization of secondary level medical facilities. It is important to evaluate the impact of the social insurance program because it will provide insights to policy makers regarding whether the existing program can help achieve health equity. Therefore, this research has a policy implication for improving the quality of the universal health insurance program in Indonesia and achieving health equity.

2. LITERATURE REVIEW

2.1. Theoretical Consideration on Demand for Health Care

Economists consider health as a form of human capital (Becker, 1993; Mushkin, 1962). Then, conceptually, people will tend to improve their human capital with the assumption that it will improve their productivity. Improvement in people's productivity will bring them more utility or welfare. Moreover, health also affects the total amount of time for people to be productive and generate earnings (Grossman, 1972). Thus, this concept can be the rational logic for why health is important, and people have demand for it.

Furthermore, a health subsidy program by the government may increase the demand for health service. Subsidy on health insurance premium will make the eligible participants enjoy the insurance service without any required payments. Then, when a good or service has zero price, not only are its costs lowered but its benefits also increase. Thus, preference for the good increases (Shampanier et al., 2007). Based on this argument, the demand for health care should have increased for the subsidized poor people because they make no payments for insurance benefits compared to other participants who pay for the same level of benefits.

However, the free health services provided for subsidized participants do not signify a zero-cost option in receiving treatment. . Grossman (1972) argued that health service is a derived demand, in which to enjoy the health service as a commodity, the consumer must trade for their time. Then, based on the opportunity cost of the time that must be spent to get the benefit of such service, people will determine their optimal quantity of time that they can use (Becker, 1965; Ben-Porath, 1967). Therefore, the decisions to visit medical facilities may be

affected by other costs related to obtaining the services, such as the cost of a lost opportunity in generating income due to visiting a health facility

Under rational conditions, when those costs are higher than the expected benefits of receiving medical treatment, this group may deter utilizing health care. Moreover, when the number of patients is considerably high and the capacity of health facilities is limited, there will be more competition to get treatments. Increasing rivalry to utilize the health care services will also increase the opportunity cost due to, for example, the increased time spent queuing at health facilities.

On the other hand, the other group of insurance participants who do not eligible for the subsidy have to compulsorily pay insurance premiums. Thus, the motivation for the same may be different from that of voluntary insurance wherein the participants are willing to enroll if the value of the benefit is not below the cost of the premium. This implies that, to maximize the benefits obtained from the health insurance, they will be motivated to utilize the health care facilities. However, the relative premium cost to the individual wealth must be considered. When it is high enough to be considered as valuable by an individual, the motivation is expected to be higher.

2.2 Health Insurance Program in Indonesia

The government of Indonesia introduced a national health insurance program known as *Program Jaminan Kesehatan Nasional (JKN)* in 2014. This program combined all the previous health insurance programs provided by the government under different names and schemes. It is mandatory for all citizens and reduces out-of-pocket payment for health services. In general, the participants of JKN can be categorized into three groups: (1) people who are fully subsidized by the government (*penerima bantuan iuran/PBI*), that is, the poor whose premiums are paid by the government; (2) people who work in formal sectors and whose premiums are based on their salaries and co-paid by their employer; and (3) non-salaried workers or entrepreneurs whose premiums are based on specific prices regarding the benefits.

Prior to JKN, Indonesia had several different health insurance programs that covered different groups of people. First, there were two mandatory health insurance programs for formal sectors in which premiums for beneficiaries were related to earnings but not to the benefits: *Asuransi Kesehatan/Askes* (health insurance program) for government employees and *Jaminan Sosial Tenaga Kerja/Jamsostek* (labor social security) for private sector employees (Hidayat, 2004). Second, a health insurance program (*Askeskin*) for the poor was established in 2005, with the premiums fully subsidized by the government. The government changed this program to the *Jamkesmas* program in 2008, which increased the coverage to include the near-poor (Rizal & van Doorslaer, 2019; Sparrow et al., 2013).

Upon the transformation from *Jamkesmas* to JKN, the government provided similar health services for poor beneficiaries. To maintain the health support for the poor and near-poor, the government adapted the scheme for *Jamkesmas* beneficiaries to the subsidized group in JKN (known as *Penerima Bantuan Iuran/PBI-JKN*). The benefits of those programs cover all treatment from the primary health care (i.e., public health center/*puskesmas*) to the secondary level (hospital).

2.3. Empirical Studies

The government of China introduced a new health insurance program in 2003 to replace its old village-based rural health insurance program (Wagstaff et al., 2009). The Chinese government implemented the new program at the county level instead of the village level, thereby increasing the economic scale and risk pool. During the 2003–2005 period, the minimum premium payment was 50 RMB. From that amount, the beneficiaries only paid 10 RMB, and the local and central governments subsidized the rest (20 RMB each).

Wagstaff et al. (2009) compared the outcome of inpatient and outpatient visits between the participants, non-participants, and the people who were not covered by the program. The double-difference method was used to estimate the changes in results between (1) the participants and non-participants and (2) the participants and non-covered people. The results revealed that the program could increase the probability of outpatient visits and inpatient care; however, it did not have a positive impact in reducing out-of-pocket spending. Apparently, this was because they received more expensive outpatient costs per visit. This also caused poorer people to utilize less services at a higher level of health facilities.

There are several similarities between the rural conditions in China and Indonesia that makes them comparable in evaluating the health insurance program. First, the government structure in China is relatively similar to that in Indonesia in terms of the division of central and local governments. There are also general disparities in the income and education levels between rural and urban areas. However, the Chinese government implements a different scheme for its public health insurance than Indonesia. While China uses a co-payment system, Indonesia uses a fully subsidized system for the poor. Therefore, the payment scheme differs, but a similar rural condition may be used as a comparison to the outcome.

From the 1990s to the 2000s, Vietnam implemented various health insurance schemes (Wagstaff, 2010; Wagstaff & Pradhan, 2005). The government of Vietnam introduced a compulsory Vietnam health insurance (VHI) program in 1993, which limited the targeted participants to employees of government and state-owned enterprises and private firms with more than 10 employees as well as communist party officials, military personnel, and retired government officials. From 1993 to 1998, the VHI program did not require co-payment from the participants. There were also the voluntary participants, who were mainly students. Later, in 2003, Vietnam introduced health insurance for the poor in the form of a health care fund (health care fund for the poor/HCFP). Three categories of people are eligible for this social security: the poor (according to the government official standard), all households living in communes, and ethnic minorities living in mountainous provinces.

There are two studies related to health care insurance in Vietnam (Wagstaff, 2010; Wagstaff & Pradhan, 2005). The first one analyzes the impact of VHI in the 1990s by using the double-difference and propensity score matching (PSM) methods to compare the outcome difference between 1993 and 1998. The results show that VHI caused an increase in the number of outpatient and inpatient visits to hospitals and a decrease in personal spending for health services. The second study analyzes the impact of HCFP by observing the outcomes of individuals covered by HCFP and those who are not through the triple-difference method with PSM. The results show that HCFP has no impact on health service utility but decreases out of pocket spending. The study suggests that this may be due to a non-price constraint faced by the

participants. In other words, the insurance program in Vietnam cannot eliminate the inaccessibility of health care for the poor.

These two studies in Vietnam make good comparisons to analyze the JKN program in Indonesia. The health insurance program in Vietnam is similar to the JKN in Indonesia: the poor people are fully subsidized, and the other groups must pay the premiums. The different results in Vietnam's studies may provide a base for investigating the JKN program regarding whether the fully subsidized insurance program in Indonesia is able to increase health care utility or, like in Vietnam, whether the health insurance for the poor cannot improve health service utilization.

Several studies in Indonesia showed that the past public insurance had give more benefits to those who are not covered by the subsidy. Hidayat (2004) who found that in the *Jamsostek* scheme, in which every participating employee had to pay the insurance premium, increase in health care utilization was greater among the poorer participants than among richer individuals. Moreover, Erlangga et al. (2019) observed that the impact of JKN program in 2014 on health care utilization was higher for the contributory participants than the subsidized participants.

3. DATA AND METHODOLOGY

The data for this study was obtained from the socio-economic surveys conducted by Statistics Indonesia in 2013 and 2018. The data from 2013, which acts as the baseline year, shows the condition of Indonesian people one year prior to the implementation of the JKN program. Then, to evaluate the change of people's behavior toward health care utilization, the data from 2018, which indicates the effect of JKN program five years after its operation, was used. Due to the limited access to the data and the time lag of the data publication by Statistics Indonesia, we could not use the 2019 data while conducting this research. Furthermore, to avoid the bias of health care utilization due to the Covid-19 pandemic, we did not use the data for the year 2020. Thus, the analysis was conducted with 2,226,004 individual samples—1,094,179 samples from 2013 and 1,131,825 samples from 2018. Since the surveys were not performed on the same persons for the two years, this study used pooled cross-sectional data.

Then, two estimation models were employed to identify the impact of health subsidy on the utilization of different types of health care facilities. First, a logistic regression model was used to estimate the odds of individuals who are eligible for health subsidy in utilizing each type of health care facilities, compared to those who are not eligible. Because the dependent variable used in this study has a binary value, this model was expected to be suitable to estimate the effect of health subsidy on health care utilization. Further, the marginal effect of the health subsidy on health care utilization was calculated.

The specification of the health care facilities utilization model using logit regression was estimated using the following equation:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \alpha_0 + \beta_1 \text{Health Subsidy} + \beta_2 [\text{Covariates}] + \varepsilon$$

where $\ln\left(\frac{P_i}{1-P_i}\right)$ is logarithm of ratio for the occurrence of patient using the health care facilities when they are ill (as a value 1), health subsidy is the condition of the patient regarding whether they are eligible for the health insurance subsidy, and covariates are the other

respondents' characteristics used in this study (these are explained later). Then, α_0 , β_1 , and β_2 are the parameters to be estimated, and ε is the error term assumed to be normally distributed.

Due to the nature of the JKN program, this study has a high possibility for a selection variable bias. Since the insurance subsidy is given to people with specific criteria, particularly the poor, the subsidy policy is not randomized. On the other hand, the National Health Insurance in Indonesia was not present before 2014, and the participants have gradually increased since 2015. Therefore, the characteristic of this policy allowed us to conduct an impact analysis of the full health insurance subsidy to the utilization of various health care institutions using a second method, namely the difference-in-differences (DiD) model. The DiD model was used because it can address the variable bias problem that may occur in the estimation (Heckman et al., 1998).

The DiD model was used to estimate the causal effect of health subsidy on health utilization. In this model, the observations were categorized into treatment and control groups. The treatment group comprised those who are eligible for the health subsidy program (*Jamkesmas* and *PBI-JKN*), while the control group comprised those who are ineligible for the subsidy. Then, the key of DiD model is the improvement of the potential outcomes in the control groups (Angrist, Joshua D; Pischke, 2008).

Using this model, the behavior of the treatment group in two years, before and after the introduction of JKN (2013 and 2018), was evaluated. By comparing the behavioral differences between the two years and using the control group behavior as the counterfactual variable for the unobserved outcome of the treatment group, the real impact of the subsidy program could be inferred. The difference in outcome between the control group and treatment group, or the average treatment effect on the treated (ATT), can be described as follows:

$$ATT = (Y_1 - Y_0 | D = 1) = E(Y_1 | D = 1) - E(Y_0 | D = 1)$$

The DiD estimation then might be formulated as follows:

$$y = \alpha + \beta_1 Time + \beta_2 Health Subsidy + \beta_3 (Time * Health Subsidy) + \beta_4 [Covariates] + \varepsilon$$

where,

Y = outcome variable

α = intercept

β_1 = time effect

β_2 = the selection effect of being eligible for health subsidy or not

β_3 = the DiD effect, or the effect of the health subsidy

β_4 = the effect of covariates

ε = error term

Then, the variables used in this study are as follows:

a. Dependent variable

The dependent variable of this study is the outpatient who visits a health facility. The health facilities are consisted of public health center (*puskesmas*), public hospital, private hospital, polyclinic, and medical practice. The value is 1 if an individual comes to such a facility when they are ill and 0 otherwise. The descriptions of the health facilities used in this study are as follows.

- Public health center (*puskesmas*)
A public health center is a government-funded, first-level health care facility at the sub-district level. There is at least one *puskesmas* for each sub-district.
 - Medical practice
This is a private, basic health care facility that's operated by a single medical practitioner (doctor, nurse, or midwife).
 - Polyclinic
This is a private, basic health care facility that offers various kinds of treatments beyond medical practices. It is operated by two or more medical practitioners (doctor, nurse, or midwife).
 - Public hospital
A public hospital is a government-funded secondary health care facility that provides healthcare at the sub-district level. There is at least one public hospital for each district.
 - Private hospital
This is a privately funded secondary-level health care facility. Typically, there are more private hospitals in urban areas than rural ones.
- b. Independent variable (variable of interest)

The health subsidy beneficiary is the interest-independent variable in the present study. The value is 1 if individuals are eligible for *Jamkesmas* or the PBI-JKN program and 0 otherwise.

c. Covariates

- Regional type : The value is 1 if individuals live in city and 0 if they live in village.
- Gender : The value is 1 if male and 0 if female.
- Age
- Marital status : This comprises four categories: single, married, divorced, and widowed.
- Last education : This consists of six categories: without elementary education, elementary education, junior secondary education, senior secondary education, college, and higher education.
- Illness : The value is 1 if individuals experienced an illness in the last month that disrupted work/school and 0 if otherwise.
- Poverty : The value is 1 if an individual's expenditure per capita is below the poverty line and 0 if otherwise.
- *PKH* : The value is 1 if individuals ever become eligible for the conditional cash transfer program known as *Program Keluarga Harapan* and 0 if otherwise.
- Expenditure per capita

The main assumption to identify the causal effect in DiD is that the trends of the outcome would be the same in both groups in the absence of treatment of subsidy (Angrist, Joshua D; Pischke, 2008). One method to identify the common trends or parallel trends between the treatment and control groups is by using a placebo falsification model (Cunningham, 2021). The

placebo falsification for DiD model can be done by fitting the original DiD design into the other groups that is not be affected by the treatment (policy) as the outcome variable. When the effect of the treatment on the placebo outcome is insignificant, but the effect of the treatment on the original outcome variable is significant, it can be inferred that the model has provided strong evidence that the original DiD model is unbiased.

Then, to test the parallel trend, we use the individual outpatient record in the previous month as the placebo outcome. The logic for this model is that the health subsidy policy by the government, whether before or after the implementation of JKN program will not affect the patient that has been treated as an outpatient. Thus, the parallel trend assumption in the DiD analysis in this research is valid if the treatment policy does not have a significant effect on the placebo outcome.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Table 1 illustrates the individual characteristics during the baseline year 2013 and evaluation year 2018 for the treatment and control groups. The ratio of the treatment group (people who are eligible for the health insurance subsidy) to the total sample in the two periods is similar: 30.5 percent in 2013 and 33.8 percent in 2018.

Looking at the outcome variables, there are several similarities and variations in the patterns of health care utilization between the treatment and control groups during the two time periods. In 2013, the utilization of public health centers between the two groups had the highest means difference by 3.8 percent, in which the treatment group had a higher average value (column 4). Meanwhile, the differences in the utilization of other health care facilities were statistically insignificant. There were more people in the control group who utilized the services at private hospitals and polyclinics compared to the treatment group, and the utilization of public hospitals was the same on average. Moreover, column 2 shows that the treatment group went to the public health center the most when they were ill compared to the other health care facilities. On the other hand, on average, 3.9 percent, 3.8 percent, and 3.9 percent of the control group, respectively, went to public health centers, medical practices, and polyclinics (column 3).

Table 1: Summary statistics for outcome variables and covariates, 2013 and 2018

Variable	2013			2018		
	Treatment N = 334,145	Control N = 760,034	Diff	Treatment N = 382,318	Control N = 749,507	Diff
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Outcome variables: outpatient visits						
Public health center	0.077	0.039	-0.038	0.087	0.045	-0.042
Public hospitals	0.009	0.009	0	0.017	0.011	-0.006
Private hospitals	0.003	0.006	0.003	0.006	0.009	0.003

Variable	2013			2018		
	Treatment N = 334,145	Control N = 760,034	Diff	Treatment N = 382,318	Control N = 749,507	Diff
Medical practices	0.043	0.038	-0.005	0.041	0.053	0.012
Polyclinics	0.024	0.039	0.015	0.012	0.02	0.008
B. Covariates						
Urban	0.301	0.482	0.181	0.36	0.458	0.098
Sex	0.501	0.501	0	0.497	0.503	0.006
Age	29.264	30.031	0.767	32.736	29.179	-3.557
Marriage status:						
Single	0.482	0.452	-0.03	0.428	0.472	0.044
Married	0.446	0.486	0.04	0.494	0.465	-0.029
Divorce	0.015	0.014	-0.001	0.016	0.016	0
Widowed	0.057	0.048	-0.009	0.062	0.046	-0.016
Last education:						
Junior secondary education	0.17	0.162	-0.008	0.163	0.138	-0.025
Senior secondary education	0.134	0.214	0.08	0.154	0.189	0.035
College	0.005	0.023	0.018	0.01	0.019	0.009
Higher education	0.018	0.07	0.052	0.026	0.061	0.035
Illness	0.167	0.13	-0.037	0.157	0.134	-0.023
Poverty	0.239	0.099	-0.14	0.157	0.102	-0.055
Conditional cash transfer program (PKH)	0.061	0.009	-0.052	0.256	0.052	-0.204
Expenditure per capita (thousands IDR)	459.22	806.8	347.58	835.88	1,166.68	330.8

Source: author's calculation based on Susenas 2013 and 2018

In 2018, there was an increase in the utilization of public health center in both groups; however, the trend remained the same with the treatment group having a higher mean (column 7). Further, public health centers remained the most utilized health care service for the treatment group (column 5). After the implementation of JKN, for the treatment group, the

utilization of medical practices and polyclinics decreased on average, but there were more outpatient visits in the public hospitals. On the other hand, the control group mostly utilized medical practices (column 6). The utilization of polyclinics decreased on average for both groups. Lastly, the differences in the health care utilization between the treatment and control group for the evaluation period were statistically insignificant (column 7).

Next, the covariates panel of Table 1 shows the comparison of socio-economic characteristics between the treatment and control groups in the base year and evaluation year. In both years and for both groups, more individuals lived in rural areas than urban areas. In 2013, the share of people who lived in urban areas was 30.1 percent for the treatment group and 48.2 percent for the control group. The pattern was the same in 2018, in which the shares of the sample who lived in urban areas for the treatment and control groups were 36.0 and 48.5 percent, respectively.

Further, the ratio of male and female individuals in each group was almost the same in both years. While in 2018 the number of males in the treatment group was less than the females and the opposite for the control group, the difference was statistically insignificant at 0.6 percent. On average, the age differences between the treatment and the control groups were also statistically insignificant, which were 9.2 months in 2013 and 3.6 years in 2018, with the median age at approximately 30 years old. The marriage statuses between the treatment and the control groups in 2013 were not significantly different. Even though there were changes in the pattern in the evaluation year, the differences were insignificant. Health conditions for the two groups shows that in both periods, the number of samples in the treatment group who was ill in the month preceding the survey was on average higher than the control group, although there were no statistical differences.

The economic condition between the two groups shows that the treatment group was, on average, poorer than the control group. This condition also correlates with the years of education and the conditional cash transfer beneficiary eligibility. Based on the years of education, the control group had higher percentages of people with more than nine years of education (higher than junior secondary education) compared to the treatment group in both 2013 and 2018. Similarly, the percentages of conditional cash transfer beneficiaries were, on average, higher in the treatment group than the control group.

Parallel Trend Assumption

Table 2 shows that the treatment effect of the health subsidy over time does not have a significant effect to the placebo outcome, that is the outpatient status in the previous month. It is indicated by the p value of the variable which is greater than 0.05. Therefore, it can be inferred that the DiD model passed the parallel trend assumption.

Table 2: Estimation results for placebo falsification

Variables	Coefficient	p value
Health subsidy*time	0.0010188	0.078
_cons	0.0003804	0.000
N	2226004	2226004

Source: author's estimation

4.2. The Impact of Health Subsidy on the Utilization of Health Care Facilities

Table 3 shows that both estimations, the logistic regression and DiD, indicate a positive and significant correlation between the health subsidy and the probability of outpatient visits in public health centers (*puskesmas*). The logistic regression result shows that health subsidy increases the odds of people's visiting public health center by 1.8 times when they are ill. Moreover, holding all other variables constant, additional beneficiaries of health subsidy would increase the probability of the outpatient visits in the public health center.

Subsequently, the causal inference may be derived from the DiD estimation results. The interaction between the time and treatment variables suggests that, between the estimation periods of 2013 and 2018, those who were eligible for health subsidy under the JKN program had a significantly higher likelihood to visit public health center by 0.562 percent. Given that, in the base year, the number of people in the treatment group visiting public health centers was 7.7 percent on average, this increase is significant. Therefore, it may be inferred that under the JKN program, the health subsidy for the poor can improve the outpatient visits to a public health center. This result is in line with the study of the impact of *Askeskin* program on public health center utilization by Sparrow et al. (2013). It suggests that the public health center is the main destination for primary health care in Indonesia, especially among the poor. This results may also indicate a major improvement since 2014, despite the finding of Paramita et al., (2018) that found the low distribution index of public health centers.

Table 3: Estimation results for the impact of health subsidy on the probability of outpatient visits in public health centers

Variables	Logistic regression with covariates		Difference-in-difference	
	odds ratio	marginal effect	without covariates	with covariates
Health subsidy	1.801545***	0.027	0.0382226***	0.0270616***
Time			0.0063951***	0.0025341***
Health subsidy*time			0.0034197***	0.0056253***
_cons	0.0304336***		0.0388667***	0.0319244***
N	2226004		2226004	2226004

Significance indicators: * p<0.1, ** p<0.05, *** p<0.01

Source: author's estimation

Additionally, the conditional cash transfer program also has a significant and positive impact on the probability of outpatient visits in public health centers (see Appendix A). This could be caused by one of the conditions for receiving the subsidy in the PKH program. The PKH program mandates its beneficiaries to conduct regular obstetric examinations for pregnant

women as well as immunizations and the weighing of children under five years old. These services can be easily accessed in the public health center.

Moreover, Appendix A also shows that the urban residential status and amount of expenditure per capita have a significant and negative correlation with the outpatient visits to public health centers; however, the magnitude is almost zero. People in urban areas have more varied alternatives to receive primary health care services compared to those who live in rural areas, where the health care service is predominantly provided by the public health center (Sparrow et al., 2013). However, the coefficient of 0.00003 may suggest that in 2018, this disparity between urban and rural had reduced. Then, the correlation of wealth and outpatient visits in public health centers is in line with the studies by Mulyanto et al. (2019) and Hidayat (2004), which found that the probability of having outpatient visits in public primary health cares was higher when patients were wealthier, but the difference in probability was minute for each income level.

Next, Table 4 illustrates that the logistic regression and DiD estimations have a similar result about the impact of health subsidy on the probability of outpatient visits in public hospitals. The logistic regression results show that health subsidy programs have a significant impact on increasing the people's odds in receiving treatments in a public hospital by 1.38 times. Moreover, the estimation shows a positive marginal effect as well, meaning that the trend of outpatient visits' likelihood in public hospital increases along with the increasing health subsidy beneficiaries.

Table 4: Estimation results for the impact of health subsidy on the probability of outpatient visits in public hospitals

Variables	Logistic regression with covariates		Difference-in-difference	
	odds ratio	marginal effect	without covariates	with covariates
Health subsidy	1.382109***	0.003	-0.0001755	0.0008196***
Time			0.0017206***	0.0009782***
Health subsidy*time			0.0061563***	0.0053443***
_cons	0.0011105***		0.0091746***	-0.0104339***
N	2226004		2226004	2226004

Significance indicators: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: author's estimation

Then, considering the interaction of health subsidy and time variables to gain a causal impact of the health subsidy program in Indonesia during the research period, the DiD estimation also results in a significant and positive value. On average, from 2013 to 2018, the probability of people eligible for health subsidy visiting public hospital increased by 0.534 percent. In 2013, the portion of people in the treatment group visiting the public hospital was 0.9 percent. Thus, the increase of 0.534 percent of this percentage is significantly high. The result suggests that after the introduction of the JKN program in 2014, health subsidy for the poor

increased the utilization of public hospitals. This result is in accordance with Rolindrawan (2015) who found that health subsidy beneficiaries had a greater tendency to use public hospitals after the implementation of JKN program, compared to the period of the *Jamkesmas* program.

Appendix B shows that people living in urban areas have a higher tendency to use public hospitals than those living in rural areas. This is to be expected, as there are more public hospitals in urban areas than rural areas in Indonesia.

On the other hand, poverty and conditional cash transfer have a significant and negative correlation on the probability of outpatient visits to public hospitals. These results may suggest that income poverty in Indonesia has a negative impact on the access to health care, even for secondary level of medical care in public hospitals. This finding is in line with that of Mulyanto et al. (2019), who found that poor people have a lower prevalence of secondary health care use compared to wealthier people. This is probably because poor people cannot afford to pay the health service costs at the secondary level of medical care without any government intervention. Nevertheless, government aid in the form of conditional cash transfer only mandates regular check-ups at the primary health care level (*puskesmas*). Therefore, the beneficiaries of the cash transfer program have less probability to receive medical treatments in public hospitals.

The estimation results in Table 3 and Table 4 suggest that health subsidy under the JKN program could increase the utilization of public medical facilities, both *puskesmas* and public hospitals. One possible reason is that public health centers (*puskesmas*) and public hospitals automatically and mandatorily cooperate with the JKN program as the main institutions delivering health services. Thus, JKN beneficiaries, especially the subsidy beneficiaries, are always able to use their national health insurance at those health centers.

Next, Table 5 shows that both the logistic regression and DiD estimations indicate a significant and negative correlation between health subsidy and the probability of outpatient visits to private hospitals. The marginal effect in the logistic regression shows that there is a declining trend of outpatient visits to private hospitals among health subsidy beneficiaries compared to non-beneficiaries. Moreover, the odds of utilizing private hospitals for the health subsidy beneficiaries is 0.7 times that of non-beneficiaries. Further analysis of the DiD results suggests that, on average, the health subsidy for the poor in JKN program caused a decrease in the probability of outpatient visits by 0.04 percent during the five-year period under consideration. Even though the result is statistically significant, the decrease in the probability value is quite small.

Table 5: Estimation results for the impact of health subsidy on the probability of outpatient visits in private hospitals

Variables	Logistic regression with covariates		Difference-in-difference	
	odds ratio	marginal effect	without covariates	with covariates
Health subsidy	0.7051985***	-0.002	-0.0030535***	-0.0011096***
Time			0.0026443***	0.0006137***

Health			
subsidy*time		0.0000946	-0.0004621**
_cons	0.0007999***	0.0059774***	-0.0071259***
N	2226004	2226004	2226004

Significance indicators: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: author's estimation

These results suggest that, in secondary medical care, the health subsidy under the JKN program stimulates people to utilize public hospitals rather than private hospitals. Under the JKN policy, in contrast to public hospitals, private hospitals do not have an obligation to cooperate with the program; since the JKN program only covers the basic health costs (i.e., only standard medicines based on the National Formulation are used) established by the Ministry of Health, some private hospitals opt out of the JKN program if the service costs incurred in certain private health care facilities are above the national standards. Due to this, both contributory and subsidized participants of JKN cannot use the insurance in those private health care facilities. This is in accordance with the study by Erlangga et al. (2019), which noted that in the early period of JKN implementation, the national health insurance in Indonesia did not have a significant impact on the number of outpatient visits in private health care facilities for all participants in the contributory and subsidized groups. Appendix C shows that the correlation of socio-economic characteristics and the probability of outpatient visits is similar for private and public hospitals. On average, people living in urban areas have a higher tendency to utilize private hospitals because the number of hospitals is higher in cities than in villages. The government's financial aid in the form of conditional cash transfer also cannot stimulate the probability of outpatient visits in private hospitals.

However, the correlation of educational inequality with the probability of outpatient visits differs between private and public hospitals. Holding other variables constant, a higher level of education has a positive and significant correlation with the probability of outpatient visits at a public hospital (see Appendix B). On the contrary, the correlation between higher level of education and outpatient visits in a private hospital is only significant and positive for those who have college-level education (see Appendix C). This indicates, that compared to people with low levels of education, people with high educational qualifications have a better awareness of the medical treatment process in hospitals when experiencing health problems. In other words, people with less education may believe that they can treat their illness using non-prescription medicines alone (Vidyattama et al., 2014). Additionally, there may be difficulties in accessing secondary health care services due to complex administration that hinder uneducated people from receiving medical treatment even though they have access to the hospital premises (Harimurti et al., 2013). However, it is probable that public hospitals have more outpatient visits compared to private hospitals due to the financial supports for public health care provided by the government to reduce the cost (Pradhan et al., 2007). Higher costs in private hospitals causes increasing opportunity costs for people with higher education, making them more reluctant to seek medical treatments in private hospitals (Vidyattama et al., 2014).

Lastly, Table 6 and Table 7 illustrate the impact of health subsidies on the outpatient probability in private primary health care facilities, which are polyclinics and medical practices.

The logistic regression results for the two health care facilities are the same, which are significant, and the values are below one. Both marginal effects are also negative. The values imply that the beneficiaries of health subsidies reduce the odds of outpatient visits in the two health care facilities.

Table 6: Estimation results for the impact of health subsidy on the probability of outpatient visits in polyclinics

Variables	Logistic regression with covariates		difference-in-difference	
	Odds ratio	marginal effect	without covariates	with covariates
Health subsidy	0.6346092***	-0.011	-0.0151652***	-0.0119393***
Time			-0.0191003***	-0.0230920***
Health subsidy*time			0.0073205***	0.0061216***
_cons	0.006907***		0.0391548***	0.0119005***
N	2226004		2226004	2226004

Significance indicators: * p<0.1, ** p<0.05, *** p<0.01

Source: author's estimation

Table 7: Estimation results for the impact of health subsidy on the probability of outpatient visits in medical practice

Variables	Logistic regression with covariates		difference-in-difference	
	Odds ratio	marginal effect	without covariates	with covariates
Health subsidy	0.7906098***	-0.009	0.0049079***	-0.0018172***
Time			0.0149813***	0.0096449***
Health subsidy*time			-0.0172050***	-0.0139840***
_cons	0.0314087***		0.0381483***	0.0344107***
N	2226004		2226004	2226004

Significance indicators: * p < 0.1, ** p < 0.05, *** p < 0.01

Source: author's estimation

These changes are probably due to the supply side, that is, the availability of health care facilities (Erlangga et al., 2019; Mulyanto et al., 2019). Moreover, in Indonesia, availability of health services has a major role in the participation in the JKN program (Dartanto et al., 2016), affecting people's willingness to utilize health care facilities. Data from the National Social Security Council and Social Health Insurance Administration Body (2020) discloses that the number of medical practices cooperating with JKN program increased from 3,655 in 2014 to 5,552 in 2018, while the number of cooperating polyclinics increased even further, from 3,045 to 6,604.

Moreover, the impact of health subsidies on the utilization of polyclinics was found to be greater than that of public health centers. On one hand, the national health insurance program in Indonesia requires that every patient must first seek primary health care as the entry point, irrespective of their socio-economic status (Mulyanto et al., 2019). On the other hand, the growth of public health centers in Indonesia is slow (National Social Security Council and Social Health Insurance Administration Body, 2020); thus, the capacity is limited. Therefore, the patients have greater motivation to seek alternatives to the public health centers. In this scenario, the increasing number of polyclinics that have partnered with the JKN program help reduce the bottlenecks experienced by the public health centers.

5. CONCLUSION AND RECOMMENDATION

The main result of this study is that overall being eligible for health subsidy can improve the likelihood of people seeking treatments in formal health care facilities, however the impact may differ when it is compared between the private and public facilities. At the primary level health care facilities, the health subsidy can increase the likelihood of outpatient visits to public health centers and polyclinics; however, it has a negative impact on the outpatient visits in medical practices. Then, at the secondary level medical care, the health subsidy for the poor has a significant and positive impact on the probability of outpatient visits to public hospitals; however, it has a significant and negative impact on outpatient visits at private hospitals. On average, health subsidy increases the likelihood of outpatient visits to public hospitals by 0.534 percent. On the other hand, the odds of outpatient visits in private hospital decreases by 0.05 percent.

Then, based on our findings, primary health care facilities play a major role in the implementation of national health insurance in Indonesia. Primary health care becomes the first gate to access further medical treatment. Accordingly, the health subsidy has a role in reducing the disparity in utilizing health care services from the demand side. Therefore, the current study suggests that improvement in the quality and quantity of primary health care is important to support achieving health equality in Indonesia. This can be done by improving the quality of health personnel, especially in *puskesmas* as the main destination for the poor and people in rural areas. Further, government needs to increase the number of private health services participating in the JKN program. To minimize the distortion of people's preference toward private health care facilities, the government may consider a partial cooperation of several health treatments given by private health institutions. This way, more private health care institutions would have additional options to join the JKN program, and JKN beneficiaries would have more choices in seeking treatments. On the other hand, increasing health care utilization may increase the burden for the insurance funding. Therefore, in the near future the government should improve the standard for basic medical services that can be covered by the public insurance and may consider implementing the cost-sharing system to ease the financial burden.

Lastly, although this study implemented two estimation approaches to minimize the possibility of unobservable bias, several limitations are still present. The main drawback is that this study could not adequately control the effect of supply side conditions due to the data limitation in the socio-economic survey. Therefore, for future studies, it is important to consider other variables from the supply side to evaluate health care equity, such as the distance of the

patients to the nearest health care facilities (both primary level and secondary level), the number of nearby health care services, and the service quality of medical practitioners. These factors may have important effects on people's behavior in seeking medical treatments.

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APPENDIX A

Estimation results for the impact of health subsidy on the probability of outpatient visits in public health centers

Variables	Logistic regression		difference-in-difference	
	Odds ratio	marginal effect	without covariates	with covariates
Health subsidy	1.801545***	0.027	0.0382226***	0.0270616***
Time			0.0063951***	0.0025341***
Health subsidy*time			0.0034197***	0.0056253***
Urban	1.00544	0		-0.0000333
Sex	0.8276804***	-0.009		-0.0086278***
Age	0.9993404***	-0.000		0.0000366***
Marriage Status				
Single	-			-
Married	1.161882***	0.007		0.0042174***
Divorced	1.226408***	0.009		0.0071466***
Widowed	1.272838***	0.011		0.0131207***
Last education				
Without education	-			-
Primary education	0.7215561***	-0.016		-0.0163339***
Junior secondary education	0.6336553***	-0.021		-0.0213663***
Senior secondary education	0.5998601***	-0.024		-0.0219975***
College	0.5853833***	-0.025		-0.0215127***
Higher education	0.5212918***	-0.029		-0.0227350***
Illness	12.02816***	0.113		0.2126706***
Poverty	0.9458687***	-0.003		-0.0010033**
Conditional cash transfer program (PKH)	1.228761***	0.009		0.0107611***
Expenditure per capita	0.9999998***	-0.000		-0.0000000***
_cons	0.0304336***		0.0388667***	0.0319244***
N	2226004		2226004	2226004

Significance indicators: * p<0.1, ** p<0.05, *** p<0.01

Appendix B

Estimation results for the impact of health subsidy on the probability of outpatient visits in public hospitals

Variables	Logistic regression		difference-in-difference	
	Odds ratio	marginal effect	without covariates	with covariates
Health subsidy	1.382109***	0.003	-0.0001755	0.0008196***
Time			0.0017206***	0.0009782***
Health subsidy*time			0.0061563***	0.0053443***
Urban	1.665877***	0.005		0.0045865***
Sex	.9329141***	-0.001		-0.0006321***
Age	1.023245***	0.000		0.0003203***
Marriage Status				
Single				-
Married	.8740061***	-0.001		-0.0039060***
Divorced	.7359105***	-0.003		-0.0057401***
Widowed	.7125894***	-0.003		-0.0048741***
Last education				
Without education				-
Primary education	0.9238398***	-0.001		0.0000988
Junior secondary education	1.183932***	0.002		0.0018077***
Senior secondary education	1.398825***	0.004		0.0027676***
College	1.999965***	0.009		0.0076367***
Higher education	1.638194***	0.006		0.0035659***
Illness	15.09742***	0.028		0.0505458***
Poverty	0.6491923***	-0.004		-0.0011441***
Conditional cash transfer program (PKH)	0.9588088	0.000		-0.0023498***
Expenditure per capita	1***	0.000		0.0000000***
_cons	0.0011105***		0.0091746***	-0.0104339***
N	2226004	2226004	2226004	2226004

Significance indicators: * p<0.1, ** p<0.05, *** p<0.01

Appendix C

Estimation results for the impact of health subsidy on the probability of outpatient visits in private hospitals

Variables	Logistic regression		difference-in-difference	
	Odds ratio	marginal effect	without covariates	with covariates
Health subsidy	0.7051985***	-0.002	-0.0030535***	-0.0011096***
Time			0.0026443***	0.0006137***
Health subsidy*time			0.0000946	-0.0004621**
Urban	2.824776***	0.006		0.0050461***
Sex	0.9431802	-0.000		-0.0003639***
Age	1.017587***	0.000		0.0001265***
Marriage Status				
Single				-
Married	0.959943	-0.000		-0.0010776***
Divorced	0.6262383***	-0.002		-0.0039697***
Widowed	0.7914893***	-0.001		-0.0016821***
Last education				
Without education				-
Primary education	0.7483922***	-0.002		-0.0007017***
Junior secondary education	0.865009***	-0.001		-0.0003195*
Senior secondary education	1.015664	0.000		-0.0000861
College	1.457548***	0.003		0.0027970***
Higher education	1.120984**	0.001		-0.0009422***
Illness	13.3596***	0.016		0.0273204***
Poverty	0.4304123***	-0.005		0.0003177***
Conditional cash transfer program (PKH)	0.9025624**	-0.001		-0.0001454
Expenditure per capita	1***	0.000		0.0000000***
_cons	0.0007999***		0.0059774***	-0.0071259***
N	2226004	2226004	2226004	2226004

Significance indicators: * p<0.1, ** p<0.05, *** p<0.01