

# Effects of universal health coverage on health care inequality in Indonesia

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**Abstract:** The aim of this paper is to see whether the implementation of Jaminan Kesehatan Nasional, Indonesia's universal health coverage, had an effect on health care inequality. I do this by examining health care use a year prior to and following the launch of the universal health care scheme. Using data obtained from the Socio-Economic National Survey, I calculated concentration indices for age-and-gender standardized outpatient care and inpatient care use and compare the results from both period. The results suggest that while equality of health care use slightly improved following the implementation of universal health care scheme, distributions of both outpatient care and inpatient care use remained concentrated among populations who are better off.

**Keywords:** health inequalities, universal health coverage, Indonesia, concentration index, utilization

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# 1. Introduction

To have an equitable health care system is the ultimate goal of many countries as this will lead to greater economic development. As discussed in the paper by Bloom et al (2003), good health has positive effect on economic growth. One thing that a country can do to improve its population's health is by providing equal access to health care services and facilities and by ensuring that no one suffers financial hardship in getting the health services that they need, i.e. universal health coverage. Globally, the move towards universal health coverage has started decades ago with wealthier nations being the first to implement said health care schemes. This trend goes hand in hand with the statement made by the World Health Organizations Director-General, Margaret Chan, during the 65th World Health Assembly in that universal health coverage is "the single most powerful concept that public health has to offer" (Chan, 2012). However, while most of the OECD countries have successfully implemented some form of universal health care schemes, only a few developing nations have been able to do so, including Brazil, Mexico, and Thailand (Rodin & de Ferranti, 2012). For Indonesia, a developing country of around 250 million people with great economic, geographic, and cultural diversity, it can be a challenge to be able to provide equal access to health care to the population based on the level of need and not on the willingness and/or ability to pay.

Against this background, the Indonesian government declared its commitment in achieving universal health coverage by 2019 (Republic of Indonesia, 2012). The government officially launched Jaminan Kesehatan Nasional (JKN, National Health Insurance; formerly called Sistem Jaminan Sosial Nasional Kesehatan) on 1 January 2014 after passing two laws that were crucial in establishing a policy framework for the implementation of universal health coverage: Law on the National Social Security System No. 40/2004 in 2014 and Law to establish the Social Security Agency in October 2011 (Simmonds & Hort, 2013). The JKN program replaced three previously existing programs: Jaminan Kesehatan Masyarakat (known as Jamkesmas, which covered the poor/near-poor population), Jaminan Sosial dan Tenaga Kerja (Jamsostek, which covered employees working in the formal sector), and Askes (which covered civil servants, civil servants' retirees, military personnel, army veterans, police forces, and their families).

In this study of health care inequality, I build on earlier analyses of the distribution of health care use among populations and public health system reforms in developing countries and, subsequently, examine the interaction between both topics. The topic of health inequalities has been largely researched though it more often focuses on developed nations (van Doorslaer and Koolman (2004), van Doorslaer et al (2006), Abasolo et. al. (2001), and Sutton (2002)). There are also studies focusing on health care

inequalities in low- and middle-income countries, however these studies do not usually control for need variables (Somanathan and Rannan-Eliya (2005), Gwatkin et al (2000), Gao et al (2001)). This is because the population surveys in developing nations, including Indonesia's population survey, often exclude questions regarding an individual's health status. Even when they do, they usually use a subjective rating of health, which is more prone to biases. It then becomes a challenge to predict individual's level of need and, in turn, to estimate need-standardized health care utilizations. Furthermore, much of the literature done in developing countries on the topic of health care inequality often focus on cross-country comparability (Van Doorslaer & O'Donnell (2006), O'Donnell et. al (2007), Lagomarsino et al (2012)). In contrast to the abovementioned literature, this paper focuses on the comparability of health care inequality within a country as a result of a change in its health care system.

The aim of this thesis is to see whether the implementation of JKN has/will have an impact on inequalities with regards to health care use given that the main objective of the program is to expand access to health care particularly among those who were previously uninsured or were covered by Jamkesmas and Jamkesda (i.e. the poor population). I used data from 2013 and 2015, a year prior to and following the launch of the universal care respectively, to compare the degree of inequality of health care utilizations during these two periods. More specifically, I will use information regarding outpatient care and inpatient care use and adjust these variables for age and gender effects. I am unable to adjust the health variables of interest for individual's level of need given the lack of information regarding respondent's health status. There has not been any study to date that focuses on the effects of the universal health coverage on distribution of health care use in Indonesia. By studying how the public health system reform has affected health care inequality a year after implementation, I can provide policy makers with useful insights on whether they are going in the right direction as well as with future policy planning.

The remainder of this paper presents background on Indonesia's health care system, discusses past studies related to the subject of health inequality, explains the data and methods used in the analysis, presents the results, and discusses them.

## **2. Indonesia's health care market – before and after JKN**

### **2.1 Health Insurance market before JKN**

Prior to the JKN program, only around 63.5% of Indonesia's population was covered by health insurance (Republic of Indonesia, 2012). There were four major health insurance programs that was implemented by the Indonesian government. Jamkesmas, the largest government-sponsored health insurance program by percentage of population covered, targeted the poor/near-poor group and covered approximately 30% of overall population. This program was under direct supervision of the Ministry of Health and provides healthcare services free of charge at contracted providers.

In addition to the 30% population covered by Jamkesmas, around 13% of Indonesian population was covered by the health insurance programs administered by provincial governors known as Jaminan Kesehatan Daerah (Jamkesda). The target population of this program somewhat overlaps with that of Jamkesmas since Jamkesda members are residents of their respective provinces who are poor/near-poor. Similar to Jamkesmas, the main objective of this program was to cover populations in each provincial region that did not meet the national poverty threshold. Hence, there were cases of overlapping membership where the same individuals are members of both Jamkesmas and Jamkesda.

Asuransi kesehatan (Askes) was another government-sponsored healthcare insurance program that covered civil servants, civil servant retirees, military personnel, army veterans, police forces, and their families (representing around 8% of the total population). Finally, Jamsostek, which is meant for employees working in the formal sector, covered merely 2.3% of the total population. It is worth noting that the majority of formal sector employees are also likely to be covered by private health insurance contracted by the employer (employer-sponsored health insurance) which usually have a more extensive coverage compared to those provided by Jamsostek.

### **2.2 Health Insurance market after JKN**

As part of the universal health care reform, the Indonesian parliament passed a new law that authorizes a new social security administering body or Badan Penyelenggara Jaminan Sosial (BPJS). This new administrative body has two main branches: BPJS Kesehatan (or BPJS Health), which replaced the state-owned health insurance corporation Askes, and BPJS Ketenagakerjaan (or BPJS Workforce), which took over the role of the workplace insurer Jamsostek. On January 2014, Jamkesmas merged with Askes and BPJS Health was formally initiated, automatically taking on enrollees previously covered by said insurance programs. Simultaneously, Jamsostek turned into BPJS Workforce and is responsible for administering pensions, life, and workplace insurance. The health insurance aspect previously covered by Jamsostek now falls under the scope of BPJS Health. However, participants who were covered by Jamsostek are not

automatically enrolled to BPJS Health; they are required to apply in order to be enrolled to BPJS Health insurance programs. Figure 1 in the Appendix provides illustration of the nation's Health Insurance market prior to and following the implementation of JKN.

One of the objectives of the health care reform is to reduce health care inequality given that the majority of the poor populations are unable to pay for health care services hence deterring them from using such services in the first place. Under JKN, the poor/near-poor populations are categorized as Penerima Bantuan Iuran (PBI, premium assistance recipient) under the JKN program. This group receives assistance from the government with regards to the payment of the monthly premiums. Participants with Jamkesmas and Askes cards must go to their local BPJS office to replace them with the new JKN card. However, in practice, some participants have yet to exchange their card as healthcare facilities still accepts Jamkesmas and Askes card as proof of enrollment.

There are three class categories under the JKN program, with Class 1 being the highest class and pays highest premium, followed by Class 2 and Class 3. The amount of premium must be paid by Class 1 is 80,000 Indonesian Rupiah (IDR) or equivalent to around 5.30 EUR, while Class 2 and 3 pays 51,000 IDR (approximately 3.40 EUR) and 25,500 IDR (approximately 1.7 EUR), respectively. All participants must pay a monthly fee of 23,000 IDR (or approximately 1.5 EUR) on top of the premium paid. Ex-Jamkesmas participants which are now categorized as PBI under JKN program will automatically be enrolled to Class 3. On the other hand, individuals who were previously covered by Askes or Jamsostek can choose the Class they want.

With respect to outpatient care, all JKN participants are treated equally regardless of which Class they belong to. However, Class categories become important when a patient is using inpatient care at a hospital. Those in Class 1 will get better quality in terms of room facility (i.e. they will be put in a room with no more than 4 other patients) compared to those in Class 2 and 3. Comparing service quality prior to and following JKN implementation, quality of outpatient care more or less stays the same while inpatient care quality did improve especially for the poor/near-poor population even if they belong to the lowest Class under the JKN program.

During initiation of JKN program, much of the focus were on the nationwide expansion of insurance coverage among the poor population as was previously discussed. This, however, has come at the cost of the government paying less attention to the status of other participants. More specifically, the government failed to provide some clarity with regards to the status of private as well as regional health insurance programs. The law that was set in place implied that over time all health insurance programs would be integrated into BPJS Health. This confusion could have a negative impact especially for the

poor/near-poor populations who were participants of Jamkesda program since this program falls under the scope of the regional government. Several Ministry of Health officials have given statements to provide clarity and assurance to Jamkesda cardholders that they have the same rights and privilege with respect to access to healthcare facilities as those who are enrolled under BPJS PBI (i.e. premium assistance recipient). As with Jamkesmas cardholder, participants are able to use Jamkesda card as proof of enrollment when using healthcare facilities.

## **2.3 Healthcare facilities**

There are multiple types of healthcare facilities across Indonesia, with each type providing different levels of care. According to data from Ministry of Health, there are a little over 2,100 hospitals in Indonesia, 51% of which are categorized as government hospitals. Further, there is no single operator with a significant market share, making Indonesia's hospital industry extremely fragmented. Private hospitals have grown at a much faster rate in recent years compared to growth of public hospitals.

It is usually difficult to differentiate between primary and secondary care in urban areas. This is because most hospitals fulfill both types of care by providing general and specialty services even though primary care facilities (pusat kesehatan masyarakat, "Puskesmas") are located throughout the country. The role of Puskesmas becomes largely important in remote villages where access to a hospital can be difficult, and thus the difference between primary and secondary care becomes more distinct among rural areas. There are approximately 9,300 Puskesmas sites scattered all over Indonesia providing a fairly complete set of primary care services. Currently, the ratio of Puskesmas sites per 100,000 population stands at 3.83.

In addition to Puskesmas, there are community health centers that are usually staffed by volunteers with informal training from the Ministry of Health. An example of such a facility is the Pos Pelayanan Terpadu (Posyandu), beginning from an initiative started during the late 1970s which aims to reduce infant and maternal mortality rate as well as to promote family planning and provide birth control. There are approximately 268,000 Posyandus spread all over the nation which averages to 3.55 Posyandus per administrative village (kelurahan). However, lack of political support, funding, and volunteers in recent years as well as a shift in preference towards clinics or hospitals has caused half of them to become inactive ("Bid to revitalize", 2012).

The ratio of skilled health workers per 10,000 populations stood at 25.3 as of 2015 which is above the minimum threshold of 23 workers established by WHO (Ministry of Health, 2016). This is an improvement from the 2012 level of 23.2. The distribution of healthcare workers throughout the nation has also improved. While more than half of the Indonesian population resides in the islands of Java and Bali, the percentage of healthcare workers based in these two islands was only 45% in 2012. This implies that

the ratio of healthcare workers to the number of population was the lowest in the country compared to other islands. However, this figure has risen in 2015 to 49%. Based on the data from Ministry of Health (2016), the national average of ratio of general physician per 10,000 population was 1.6, while ratio of nurses and midwives were 8.76 and 4.37 (per 10,000 population), respectively.



### **3. Literature review**

This chapter reviews previous literature in the subject of equity and equality in health care. Also, more detailed insights as to the difference between inequity and inequality as well as previous empirical findings on study within the subject are provided.

#### **3.1 Inequity vs. inequality**

With regards to health care consumption, it is important to distinguish between inequity and inequality. As stated by Gravelle, Morris, and Sutton (2006), inequality occurs when different individuals consume different levels of care. Separately, inequity refers to instances where amount of care received by an individual do not match with the amount that is actually needed. To measure inequity in health, it is important to define variables which are considered to be need and non-need. That is, to test whether the condition of “equal treatment for equal need” is satisfied, one must include not only health variables but also demographic variables in order to properly capture the need-level of an individual. Demographic variables, such as age, gender, and income level as well as answer from self-reported health questions can provide some insight into how much health care is needed by an individual.

Much of the population surveys in developed countries that are used to collect data requires respondents to include self-assessed health status. Thus, it becomes relatively easier to gauge how much health care do respondents need and assess equity in health care use according to the level of need. On the other hand, it can become a challenge to obtain a need-standardized health care utilization level when conducting studies in developing countries in Asia given that the population surveys in these countries often do not include questions on respondent’s health status. Even if the population survey includes questions on health status, they use subjective health indicators in forms of self-reporting to a simple question (Rannan-Eliya and Somanathan, 2006). This is problematic since answering a simple question (as opposed to a more systematic questionnaire, such as, the SF-6D) is more prone to biases. One’s income or education level or whether they live in urban or rural area can have an impact on how a person answers a self-rated health question. As discussed in the paper by Bago d’Uva et al (2008), answer to a self-reported health questions are affected by individual’s socioeconomic status. It was found that for the same level of “true health”, a person with higher education will report worse level of health on categorical scale (i.e. 5 levels ranging from very poor to very good).

Further distinction between vertical and horizontal inequity are also important to take into account when conducting studies that assess equity in health care. Rannan-Eliya and Somanathan (2006) provided in their paper the differences between the two concepts. Horizontal equity refers to an instance whereby access to, utilization of or expenditure made with regards to health care is equal amongst those with equal

needs. In other words, when health care use is affected by non-need variables then there is horizontal inequity (i.e. individuals characterized by the same need-variables consume different amount of care). Vertical equity, on the other hand, is defined as when individuals with different level of needs consume “appropriately” different amount of health care (i.e. those with greater needs have more access to, use more of, or spend more on health care). While it may be easy to distinguish between the two concepts theoretically, differentiating them empirically is more problematic.

### **3.2 Previous studies**

There have been many studies conducted that focused on health care inequalities as well as inequities. Health equity has gained popularity within the past 25 years reflecting a growing interest in the subject by policy makers, donors, non-government organizations. Particularly for policy makers, there has been a shift in interest from cost containment and efficiency to equity (O’Donnell et al, 2007). Oftentimes, these studies focused on comparisons of distribution of utilization of or access to health care services across income or socioeconomic groups where the health variable of interest are adjusted for need (i.e. whether or not inequity exists). Researchers usually focus more on inequity rather than inequality given that the latter will only provide information on whether individuals from different income or socioeconomic level utilize or have more access to medical care while the former provide more insight into whether medical care needs of individuals, regardless of their income or socioeconomic level, are met.

The readiness of data as well as a more comprehensive set of information contained in the data sets in more developed countries enable researchers to assess inequities in health care. A study conducted by Abasolo et. al. (2001) delved into the topic of both horizontal and vertical equity in access to and utilization of publicly-funded Spanish general practitioners (GPs) in 1993. In this study, the authors have successfully overcome the abovementioned difficulty of empirically differentiating horizontal and vertical equity. They define access and utilization according to need whereby the authors created proxies for individual’s level of need using, among other things, categorical variable to indicate individual’s perception of their general health (i.e. a 5-level rating from very good to very poor), a set of dummy variable to indicate whether respondent has any of the seven listed chronic conditions, and categorical variable derived from self-reported height and weight to indicate whether an individual is underweight, normal, overweight, or obese. In the study, they found that GP utilization seemed to be consistent with the principle of vertical equity but not for horizontal equity. There appeared to be horizontal inequity in GP utilization that favor individuals belonging to the lower socioeconomic group, women with less educational qualifications, unemployed males, and individuals living in selected regions. With regards to access to GP, the study did not assess the extent of any vertical inequity in access given that the result for travel time was not significant. Further, they compared the partial effect of travel time by non-need characteristics (e.g. gender), socioeconomic

level, education background, and age groups to test horizontal equity in access. The difference for all aforementioned comparisons are not significant.

Similar study was conducted in England by Morris et. al (2003) where they test for horizontal inequity and measure the extent of health care inequality and inequity using concentration index. They further decompose the concentration index to assess the contribution of need, supply, and non-need variables to health care inequalities. The results indicated that there were horizontal inequities in health care utilization in England in terms of income, ethnicity, employment status, and education. These variables were also the driving factors in health care inequality. Individuals of ethnic minorities and of low-income level are more likely to consult their GP but less likely to receive secondary care. Also, individuals with lower levels of formal qualifications are more likely to consult their GP but less likely to have day case treatment or inpatient stays. Supply factors have relatively little contribution to income-related inequality or to overall inequality in health care use.

As was previously discussed, the lack of information on reliable health status measure in the region has hindered empirical work on horizontal equity in health care utilization. Consequently, most studies on equity in health care use has not been standardized with respect to need with the exception of Japan, Korea, Taiwan, and Hong Kong whereby results reported in these countries show similar pattern observed in most European nations. That is, a pro-poor distribution of health care use but a flat or pro-rich distribution when standardized for need. Keeping in mind the lack of information needed to standardize use according to need, results from almost all studies to date which focused on equity in health care utilization points to the same direction: receipt of medical treatment in most of low- and middle-income countries in Asia favors population who are better-off financially (Rannan-Eliya and Somanathan, 2006). Gao et. al (2001) presented in their paper changing utilization of health care between 1993 and 1998 among different income groups in urban China. The use of in-patient care dropped significantly and the decrease was larger among the lowest income group compared to the highest income group. Further, there was a marked increase between 1993 and 1998 among the lowest income group who claimed financial difficulty as the major reason to not seek any treatment even though they have reported to have an illness. They concluded that access to formal health services in urban China has worsened, particularly among the poor, and that access has become more inequitable since the early 1990s.

While the majority of empirical work in Europe are interested in differences in use of GP and secondary care (i.e. specialist or hospital care), studies conducted in the Asian region focus less on said differences because GP do not play the gate-keeping role. As discussed by Rannan-Eliya and Somanathan (2006), most empirical work in the Asian region, particularly among low- and middle-income countries, are more interested in analyzing differences in health care use between public and private given the lack of

a social insurance system in most of these countries. Thus, the main mechanism by which public financing is being delivered is through direct provision of health care services in public providers. Results from an Equitap Study (Somanathan and Rannan-Eliya, 2005) provide evidence that inpatient care utilization in most of Asia have pro-rich distribution. Another study by Gwatkin et. al (2000) led to similar results whereby the use of maternal and child health services in majority of Asian countries are more concentrated among populations who are better-off. This was shown by positive concentration indices for measures such as medically-assisted deliveries, delivery in a public facility, and sought medical treatment if ill.

Furthermore, studies on inequities in health care in Asia are often comparative studies, usually comparing evidence from countries within Asian region, due to the similarities in characteristics among said nations. In their paper, O'Donnell et. al. (2007) conducted a comparative study across 11 Asian countries and provinces on the incidence of public health spending. They estimated and assess the distribution of public health care (hospital inpatient care, hospital outpatient care, and non-hospital care) in relation to individual's economic status by examining whether the concentration curve dominates the 45-degree line. Moreover, they also test to see whether the poorest 20 percent of individuals consume more than 20 percent of health care. Their analysis revealed great variation across Asian countries and provinces. While public spending is strongly pro-poor in high-income state (i.e. Hong Kong SAR), the same cannot be said for low- to middle-income countries. Public health subsidy is moderately pro-poor in countries such as Malaysia and Thailand, evenly distributed in Sri Lanka, and slightly pro-rich in Vietnam. They also found that even is subsidy distribution are not pro-poor in most cases, they are inequality reducing in all cases except India and Nepal.

In contrast to other studies on inequities in health care that compares evidence across different countries, this study focuses on comparing evidence within a country over time. Further, the analysis presented in this thesis builds on previous studies on health care system and the impact of socioeconomic status on health care utilization.

## **4. Data and methodology**

The ultimate goal of this thesis is to examine whether universal health coverage had an impact on the distribution health care utilization. Prior to the implementation of JKN, health care utilization was higher among population who are better-off. Given that the aim of universal health coverage is to expand access to health care, especially among population who are poor or previously uninsured, I expect that health care utilization will be more evenly distributed. In this chapter, I will discuss the data and methodology used to determine whether distribution of health care utilization in Indonesia have improved following the implementation of JKN.

### **4.1 SUSENAS data set**

The data used as a basis of the analysis in this thesis is Survei Sosial Ekonomi Nasional (SUSENAS, National Social Economic Survey). The survey is conducted by Badan Pusat Statistik (BPS, Central Bureau of Statistics) every year or two. I used data from years 2013 and 2015, which is a year before and after the implementation of JKN. The survey includes data ranging from demographic description to information related to socioeconomic status. Information on individual's health status was lacking from my data and thus it will be challenging to measure health inequity as I do not have all the information necessary to assess a need-standardized health care utilization.

In order to evaluate changes in health care utilization due to universal health coverage, the health care variables of interest in this analysis are respondents' outpatient and inpatient care utilization. Individuals participating in SUSENAS were asked whether they have used outpatient care within the last one month and whether they have used inpatient care within the last one year. These variables are measured as binary variables. Demographic variables that have an effect on health care utilization, such as age and gender, are also provided from the data set.

Variables relating to individual's socioeconomic status are also included in the data set, such as, educational background, asset ownership, social support, insurance coverage, and current living arrangement, among other things. It is worth mentioning that although information on individual's insurance coverage is included in the survey data, a more detailed information into which class of the BPJS Health are they enrolled in are not included. The data also provides information regarding expenditure levels, including overall household and per capita expenditure as well as breakdown of food and non-food expenditure. In addition, respondents were asked to provide monthly household income earned, however I

could not access the income data as the reliability of the answer was questionable.<sup>1</sup> Hence, I will construct a wealth index as an income proxy, using information pertaining to individual’s asset ownership.

The total number of observations is 1,057,811 and 1,058,221 in 2013 and 2015, respectively. In 2013, the variable outpatient use has approximately 760,000 missing value while inpatient use only has 11,000. Similarly, in 2015 inpatient use has approximately 12,000 missing values while outpatient use has 750,000 missing value. Hence the total number of observations with non-missing values for outpatient use is around 300,000 compared to 1,000,000 non-missing values observations for inpatient use. It is worth noting that the number of respondents that have used outpatient and inpatient care rose between 2013 and 2015. Outpatient care utilization rose from 48.2% to 55.5% while inpatient care rose from 2.3% to 3.5%.

*Table 1: Summary statistics of variables used in regression models*

Variable			2013		2015	
	Min.	Max.	Mean	Std. Dev.	Mean	Std. Dev.
<i>Health care utilization</i>						
Outpatient care	0	1	0.469	0.499	0.542	0.498
Inpatient care	0	1	0.024	0.153	0.035	0.185
<i>Age and gender</i>						
Age category	1	5	2.270	1.046	2.275	1.044
Female	0	1	0.495	0.500	0.495	0.500
<i>Socioeconomic status</i>						
Education	1	4	1.991	1.049	2.018	1.047
Per capita expenditure	1	5	3.219	1.392	3.193	1.397
Wealth index	1	5	3.043	1.408	3.044	1.403
Household food expenditure	1	5	3.131	1.409	3.108	1.408

## 4.2 Measuring inequality in health care utilization

### *Calculating Concentration Index*

As in the study conducted by van Doorslaer et al (2006), I will use the concentration index as a measure of inequalities in health care use in this analysis. Concentration index is considered to be the most appropriate measure of socio-economic inequalities in health (Morris et al, 2005). The concentration index is equal to twice the area between the concentration curve and the 45-degree line of equality whereby the concentration curve “plots the cumulative percentage of the health variable against the cumulative percentage of the

<sup>1</sup> This information was obtained from private communication with the Chief of Policy Working Groups of the Secretariat of the National Team for the Acceleration of Poverty Reduction.

population ranked by living standard” (O’Donnell et al, 2007). Figure 2 in the appendix illustrates a hypothetical concentration curve. Below is the formal definition of the concentration index:

$$C = 1 - 2 \int_0^1 L_h(p) dp$$

An even distribution of health care utilization is shown by the concentration curve coinciding with the 45-degree line of equality or a concentration index of zero. If health care utilization is more distributed among the rich population (pro-rich inequality), the concentration curve will lie below the 45-degree line and concentration index is positive; the opposite is true when health care utilization is more distributed among the poor population (pro-poor inequality).

As was mentioned previously, I could not use the income data given that it was not reliable. Instead, I created an income proxy by adopting the approach taken by Vyas and Kumaranayake (2006) to construct a wealth index. This was done by performing principal component analysis on individual’s asset ownership. More specifically, I used information pertaining to individual’s ownership status of the house in which they live in, sanitation facility, source in which they get water to drink, the materials of the roof, walls, and floor, and whether or not they own a motorcycle, car, refrigerator, water heater, air conditioner, cable tv, and/or laptop/personal computer. In addition to the wealth index, I also rank the population by overall per capita expenditure as well as household food expenditure. The addition of household food expenditure as ranking variable is due to the fact that per capita expenditure includes health care expenditure which could lead to endogeneity problem. That is, individual with higher per capita expenditure could use more health care services because they spend more on health care. I then compare the concentration indices for outpatient and inpatient care use in 2013 and 2015 using each ranking variable to see whether distribution of health care utilization has been less unequal after the reform.

The method that is used to calculate concentration indices in Stata is based on the methods presented in O’Donnell et al (2004).<sup>2</sup> The command provides point estimates, standard errors of a range of concentration indices, as well as graphs of concentration curves.

### ***Regression models for health care use***

I also estimated linear regression models for each of the types of health care utilization in both years to corroborate the result of my analysis above. Age, gender, education, and wealth status were chosen as explanatory variables. Demographic variables are included to control for the effects it has on health care utilization, hence ensuring that the estimated coefficients of the socioeconomic status variables do not

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<sup>2</sup> The name of the Stata command is *conindex*.

capture any of the age and gender effects on outpatient and inpatient care use. Education level and wealth status are included to see whether a person's socioeconomic status affects his/her health care utilization. I used three proxies to indicate individual's wealth status: per capita expenditure, household food expenditure, and wealth index. I transform all of the aforesaid wealth status variables into quintiles to roughly categorize the population into very poor, poor, normal, rich, and very rich. Further, for each of the proxy used to control individual's wealth, I estimate two regression models: one where education is controlled for and another where it is not controlled for. A total of 24 linear regression models were estimated: 6 linear regression models for each of the two types of health care utilization in 2013 and 2015. Estimating all 6 of the linear regression models could provide me a more detailed insight as well as background and intuition into the association of health care use with individual's demographic and socioeconomic status. Also, it allows me to simultaneously control for more than one socioeconomic status variables at a time.

The dependent variables in these regression models are outpatient and inpatient care use. As mentioned in section 4.1 above, these variables are measured as binary variables. To estimate the regression models, I chose linear probability model. This means that the relationships between the probability of use and the explanatory variables are assumed to be linear. A major flaw of this approach is the fact that linear probability model can yield estimates outside of the (0,1) range. However, I will not interpret the estimated coefficients and will only interpret the sign of the coefficient to substantiate the estimated concentration indices. Hence, my conclusions are unlikely to be affected even if the estimated coefficients are less than zero or greater than one.

### **4.3 Age and gender standardization of health care utilization**

Although our health care variables of interest are considerably objective, there could still be systematic differences across the population. This becomes problematic when comparing said health care variables across subgroups. Particularly in this case, there could be systematic differences in health care utilization across different age groups, i.e. older age groups will likely use more health care services compared to younger age group. The same goes for gender, whereby there could be systematic differences in health care use between male and female. Females are more likely to use more health care given that most women will give birth at least once in their lifetime thus requiring some health care assistance during that process. Hence, in order to refine the description of the association between health care use and socio-economic status, I standardize my health variables of interest for age and gender effects.

I adopt the approach taken by O'Donnell et. al. (2007) to standardize the outpatient and inpatient care use. More specifically, I followed the indirect standardizing method where the actual distribution is corrected by "comparing [the actual distribution] with the distribution that would be observed if all



individuals had their own [age and gender] but the same mean [age and gender] effect as the entire population” (O’Donnell et al, 2007). This is done by estimating the following regression model:

$$\hat{y}_i^{IS} = y_i - \hat{y}_i^X + \bar{y}$$

In other words, the indirectly standardized health estimates are equal to the difference between actual health and age-and-gender-expected health, plus the overall sample mean. Thus, in this case, the distribution of the indirectly standardized outpatient and inpatient care use across socioeconomic status can be interpreted as the expected distribution of health care utilization that would be expected to be observed, regardless of differences in the distribution of age and gender across incomes.

## 5. Result

In this chapter, the concentration indices obtained as well as results from estimating the linear regression models are shown.

### 5.1 Concentration indices

The table below summarizes the concentration indices obtained from my analysis above. It is worth noting that concentration indices for both outpatient care and inpatient care utilizations are highest when per capita expenditure is used as the ranking variable. This may be due to the fact that per capita expenditure includes health care expenditure, so it may be the case that those with higher per capita expenditure may have higher health care utilization given they spend more on health care. Overall, the results obtained are consistent with the aim of the health system reform: to achieve a more equitable health care system. Concentration indices in 2015 are lower compared to 2013 regardless of the ranking variable that is used. This implies that health care use among the poor populations have increased between 2013 and 2015 presumably due to expanding insurance coverage following the health reform.

Furthermore, the results show that inpatient care use has higher concentration indices compared to outpatient care for both years. A possible explanation is that while the cost of inpatient care service is being covered, there is a maximum threshold that the hospital can claim to BPJS Health and Class 3 coverage (i.e. the lowest class level) have the lowest threshold compared to Class 1 or 2. It is likely that the hospitals would prefer to treat richer individuals given that they probably have Class 1 coverage or private insurance in which the hospitals can obtain higher profit from. Additionally, the cost of medicine is likely to be higher when using inpatient care as opposed to outpatient care since patients using inpatient care are assumed to have a more serious illness. The two aforementioned points infer that individual's income level still play a significant role in inpatient care utilization despite the government assistance that has been given to the poor. This finding is consistent with the findings in the study conducted by Zhou et al (2011) in which they measure the equity of inpatient utilization in rural China. Their results suggest that given the same level of need richer individuals use more inpatient services as individuals who are better-off can afford to pay for more services and thus use more services regardless of need. They also conducted decomposition analysis to assess the contribution of the different variables on the income-related inequalities and found that income is the main factor of the inequality of inpatient care use.

Table 2: Concentration indices for health care utilizations for years 2013 and 2015

	Outpatient care*		Inpatient care*	
	2013	2015	2013	2015
Ranked by per capita expenditure	0.021	0.007	0.183	0.144
Ranked by wealth index	0.019	0.008	0.098	0.081
Ranked by household food expenditure	0.010	0.003	0.089	0.048
No. of observations	195241	216583	745505	772248

*\*Health care use are both age and gender standardized*

## 5.2 Estimation results

The tables below provide the summary of estimated coefficients of each of the regression models for both outpatient use and inpatient use and for the year 2013 and 2015.

Table 3: Estimated coefficients of regression model using per capita expenditure as income proxy

	Outpatient care 2013		Outpatient care 2015		Inpatient care 2013		Inpatient care 2015	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
Constant	0.408*** (94.99)	0.410*** (94.45)	0.526*** (133.68)	0.528*** (132.39)	0.003*** (5.66)	0.003*** (5.20)	0.008*** (11.12)	0.008*** (10.35)
<b>Age and gender variables</b>								
Age group 19-36	-0.082*** (-16.93)	-0.076*** (-15.39)	-0.105*** (-23.12)	-0.100*** (-21.50)	0.001 (1.51)	-0.000 (-0.05)	-0.002** (-2.78)	-0.003*** (-3.73)
Age group 37-54	-0.021*** (-4.77)	-0.018*** (-4.02)	-0.033*** (-8.03)	-0.031*** (-7.31)	0.010*** (14.58)	0.009*** (13.57)	0.011*** (13.74)	0.010*** (12.99)
Age group 55-74	0.044*** (9.06)	0.044*** (9.07)	0.052*** (11.36)	0.052*** (11.44)	0.035*** (41.78)	0.035*** (41.65)	0.050*** (50.68)	0.050*** (50.58)
Age group 75+	0.063*** (6.89)	0.061*** (6.69)	0.089*** (9.42)	0.088*** (9.30)	0.071*** (33.83)	0.072*** (33.91)	0.088*** (33.67)	0.088*** (33.74)
Female	-0.002 (-0.33)	-0.001 (-0.22)	-0.001 (-0.15)	-0.000 (-0.09)	0.000 (0.75)	0.000 (0.69)	0.002* (2.15)	0.002* (2.12)
Female*Age group 19-36	0.072*** (10.74)	0.072*** (10.64)	0.049*** (7.81)	0.049*** (7.79)	0.023*** (24.88)	0.023*** (24.92)	0.032*** (29.68)	0.032*** (29.73)
Female*Age group 37-54	0.045*** (7.19)	0.042*** (6.77)	0.038*** (6.57)	0.037*** (6.32)	0.005*** (4.94)	0.005*** (5.26)	0.010*** (9.07)	0.010*** (9.27)
Female*Age group 55-74	0.032*** (4.66)	0.030*** (4.30)	0.020** (3.12)	0.018** (2.83)	-0.007*** (-5.35)	-0.006*** (-5.07)	-0.008*** (-5.92)	-0.008*** (-5.71)
Female*Age group 75+	0.022 (1.62)	0.020 (1.46)	-0.001 (-0.06)	-0.003 (-0.19)	-0.019*** (-6.16)	-0.019*** (-6.06)	-0.032*** (-8.57)	-0.032*** (-8.50)

	Outpatient care 2013		Outpatient care 2015		Inpatient care 2013		Inpatient care 2015	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
<b>Education</b>								
Secondary		-0.013*** (-4.03)		-0.012*** (-4.07)		0.001 (1.55)		0.001 (1.73)
Tertiary		-0.013*** (-4.30)		-0.009** (-3.05)		0.002*** (5.19)		0.002*** (4.33)
University		-0.017*** (-3.76)		-0.016*** (-3.60)		0.003*** (5.04)		0.002* (2.57)
<b>Per capita expenditure quintiles</b>								
Second quintile	0.035*** (8.83)	0.036*** (9.02)	0.013*** (3.36)	0.013*** (3.49)	0.002*** (3.98)	0.002*** (3.71)	0.003*** (4.50)	0.003*** (4.33)
Third quintile	0.053*** (13.49)	0.054*** (13.86)	0.024*** (6.49)	0.025*** (6.75)	0.004*** (7.10)	0.004*** (6.53)	0.007*** (10.28)	0.007*** (9.92)
Fourth quintile	0.071*** (18.61)	0.073*** (19.14)	0.033*** (9.26)	0.035*** (9.70)	0.009*** (15.13)	0.008*** (14.05)	0.013*** (19.45)	0.013*** (18.67)
Fifth quintile (richest 20%)	0.096*** (25.84)	0.101*** (26.15)	0.038*** (10.84)	0.042*** (11.50)	0.022*** (37.48)	0.021*** (34.13)	0.027*** (39.34)	0.026*** (36.55)
<b>No. of observations</b>	<b>195241</b>	<b>195241</b>	<b>216583</b>	<b>216583</b>	<b>745505</b>	<b>745505</b>	<b>772248</b>	<b>772248</b>

z statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 4: Estimated coefficients of regression model using wealth index as income proxy

	Outpatient care 2013		Outpatient care 2015		Inpatient care 2013		Inpatient care 2015	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
Constant	0.412*** (102.82)	0.414*** (102.15)	0.517*** (138.20)	0.519*** (136.87)	0.004*** (6.84)	0.004*** (6.66)	0.009*** (12.34)	0.008*** (11.88)
<b>Age and gender variables</b>								
Age group 19-36	-0.076*** (-15.86)	-0.070*** (-14.03)	-0.103*** (-22.63)	-0.096*** (-20.44)	0.002*** (3.54)	0.000 (0.17)	-0.001 (-0.67)	-0.002** (-3.09)
Age group 37-54	-0.019*** (-4.28)	-0.015*** (-3.37)	-0.032*** (-7.83)	-0.028*** (-6.79)	0.011*** (16.28)	0.009*** (14.20)	0.012*** (15.38)	0.011*** (13.70)
Age group 55-74	0.049*** (10.06)	0.049*** (10.14)	0.054*** (11.97)	0.055*** (12.18)	0.037*** (43.65)	0.036*** (43.12)	0.052*** (52.79)	0.052*** (52.28)
Age group 75+	0.068*** (7.44)	0.067*** (7.25)	0.092*** (9.80)	0.091*** (9.71)	0.072*** (34.28)	0.072*** (34.31)	0.089*** (34.10)	0.089*** (34.11)
Female	-0.002 (-0.40)	-0.001 (-0.26)	-0.001 (-0.17)	-0.000 (-0.07)	0.000 (0.71)	0.000 (0.60)	0.002* (2.10)	0.002* (2.04)
Female*Age group 19-36	0.070*** (10.46)	0.069*** (10.30)	0.048*** (7.59)	0.047*** (7.50)	0.022*** (24.36)	0.023*** (24.42)	0.032*** (29.01)	0.032*** (29.02)
Female*Age group 37-54	0.047*** (7.52)	0.044*** (7.04)	0.039*** (6.66)	0.037*** (6.32)	0.005*** (5.16)	0.005*** (5.72)	0.010*** (9.28)	0.011*** (9.65)
Female*Age group 55-74	0.035*** (5.10)	0.033*** (4.70)	0.021** (3.24)	0.019** (2.87)	-0.006*** (-5.09)	-0.006*** (-4.61)	-0.008*** (-5.83)	-0.008*** (-5.46)
Female*Age group 75+	0.024 (1.83)	0.022 (1.65)	-0.001 (-0.06)	-0.003 (-0.23)	-0.018*** (-5.88)	-0.017*** (-5.70)	-0.032*** (-8.45)	-0.031*** (-8.31)

	<b>Outpatient care 2013</b>		<b>Outpatient care 2015</b>		<b>Inpatient care 2013</b>		<b>Inpatient care 2015</b>	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
<b>Education</b>								
Secondary		-0.014*** (-4.46)		-0.014*** (-4.79)		0.001* (2.48)		0.001* (2.49)
Tertiary		-0.017*** (-5.39)		-0.014*** (-4.65)		0.004*** (8.43)		0.004*** (6.77)
University		-0.018*** (-3.96)		-0.019*** (-4.31)		0.008*** (11.91)		0.007*** (8.24)
<b>Wealth index quintiles</b>								
Second quintile	0.030*** (8.45)	0.031*** (8.91)	0.021*** (6.21)	0.022*** (6.59)	0.005*** (8.10)	0.004*** (7.27)	0.006*** (9.61)	0.006*** (9.03)
Third quintile	0.061*** (17.21)	0.063*** (17.88)	0.041*** (12.15)	0.043*** (12.74)	0.008*** (13.76)	0.007*** (12.13)	0.010*** (15.04)	0.009*** (13.94)
Fourth quintile	0.074*** (20.98)	0.078*** (21.77)	0.055*** (16.38)	0.059*** (17.17)	0.009*** (16.13)	0.008*** (13.46)	0.013*** (19.75)	0.012*** (17.62)
Fifth quintile (richest 20%)	0.090*** (24.77)	0.097*** (25.20)	0.042*** (12.04)	0.048*** (13.05)	0.013*** (23.91)	0.011*** (18.40)	0.018*** (26.69)	0.015*** (21.39)
<b>No. of observations</b>	<b>195241</b>	<b>195241</b>	<b>216583</b>	<b>216583</b>	<b>745505</b>	<b>745505</b>	<b>772248</b>	<b>772248</b>

z statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 5: Estimated coefficients of regression model using household food expenditure as income proxy

	Outpatient care 2013		Outpatient care 2015		Inpatient care 2013		Inpatient care 2015	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
Constant	0.436*** (104.35)	0.437*** (103.50)	0.533*** (139.88)	0.535*** (138.33)	0.006*** (9.45)	0.005*** (8.73)	0.014*** (19.79)	0.014*** (18.45)
<b>Age and gender variables</b>								
Age group 19-36	-0.075*** (-15.60)	-0.075*** (-15.10)	-0.102*** (-22.45)	-0.100*** (-21.26)	0.002*** (3.70)	-0.000 (-0.33)	-0.000 (-0.52)	-0.004*** (-4.61)
Age group 37-54	-0.014** (-3.28)	-0.014** (-3.23)	-0.030*** (-7.35)	-0.029*** (-6.94)	0.011*** (17.41)	0.010*** (14.70)	0.013*** (16.60)	0.011*** (13.62)
Age group 55-74	0.055*** (11.24)	0.054*** (11.09)	0.057*** (12.53)	0.057*** (12.53)	0.038*** (44.98)	0.037*** (44.10)	0.053*** (53.64)	0.052*** (52.57)
Age group 75+	0.072*** (7.81)	0.071*** (7.67)	0.094*** (9.94)	0.093*** (9.85)	0.073*** (34.77)	0.074*** (34.76)	0.089*** (34.20)	0.089*** (34.17)
Female	-0.001 (-0.28)	-0.001 (-0.26)	-0.001 (-0.13)	-0.000 (-0.09)	0.001 (0.86)	0.000 (0.69)	0.002* (2.23)	0.002* (2.10)
Female*Age group 19-36	0.071*** (10.62)	0.071*** (10.57)	0.049*** (7.72)	0.048*** (7.70)	0.023*** (24.71)	0.023*** (24.73)	0.032*** (29.46)	0.032*** (29.37)
Female*Age group 37-54	0.047*** (7.57)	0.047*** (7.47)	0.039*** (6.74)	0.038*** (6.62)	0.005*** (5.27)	0.006*** (5.95)	0.010*** (9.36)	0.011*** (9.97)
Female*Age group 55-74	0.036*** (5.16)	0.036*** (5.08)	0.022*** (3.34)	0.021** (3.18)	-0.006*** (-4.96)	-0.005*** (-4.39)	-0.008*** (-5.82)	-0.007*** (-5.21)
Female*Age group 75+	0.026 (1.93)	0.025 (1.90)	0.000 (0.02)	-0.001 (-0.05)	-0.018*** (-5.90)	-0.017*** (-5.68)	-0.031*** (-8.36)	-0.031*** (-8.13)



	<b>Outpatient care 2013</b>		<b>Outpatient care 2015</b>		<b>Inpatient care 2013</b>		<b>Inpatient care 2015</b>	
	Without education	With education	Without education	With education	Without education	With education	Without education	With education
<b>Education</b>								
Secondary		-0.008* (-2.56)		-0.010*** (-3.50)		0.002*** (3.46)		0.002*** (4.30)
Tertiary		-0.003 (-0.96)		-0.005 (-1.65)		0.005*** (10.74)		0.006*** (11.65)
University		0.003 (0.60)		-0.007 (-1.60)		0.010*** (14.28)		0.011*** (14.57)
<b>Household food expenditure quintiles</b>								
Second quintile	0.009* (2.39)	0.009* (2.45)	0.012*** (3.72)	0.013*** (3.83)	0.002*** (3.41)	0.002** (2.77)	0.001 (1.75)	0.001 (1.12)
Third quintile	0.020*** (5.43)	0.020*** (5.49)	0.012*** (3.64)	0.013*** (3.80)	0.003*** (5.91)	0.003*** (4.63)	0.002* (2.50)	0.001 (1.29)
Fourth quintile	0.032*** (8.89)	0.032*** (8.88)	0.022*** (6.51)	0.023*** (6.72)	0.006*** (10.21)	0.005*** (8.00)	0.004*** (5.86)	0.003*** (3.82)
Fifth quintile (richest 20%)	0.051*** (14.30)	0.051*** (13.93)	0.024*** (7.12)	0.025*** (7.34)	0.011*** (19.02)	0.009*** (14.93)	0.009*** (12.69)	0.006*** (9.07)
<b>No. of observations</b>	<b>195241</b>	<b>195241</b>	<b>216583</b>	<b>216583</b>	<b>745505</b>	<b>745505</b>	<b>772248</b>	<b>772248</b>

z statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

### ***Demographic variables***

I start with the description of the results of the demographic variables. Age has a significant association with outpatient use in 2013 and 2015 and has similar pattern across age groups in both years. Compared to the age group 0-18, individuals in the age group 19-36 and 37-54 are less likely to use outpatient care while those in the age groups 55-74 and 75+ have higher probability to use outpatient care. These associations are all significant at the 1% level. With regards to inpatient care, compared to individuals in the age group 0-18, those belonging to the age groups 37-54, 55-74, and 75+ have higher likelihood to use inpatient care both in 2013 and 2015. These associations are all significant at 1% level. It is interesting to note that there is not clear pattern for the age group 19-36 with respect to inpatient care utilization in both years. In 2013, the significant associations between age and inpatient care use show that 19-36 age group is more likely to use said health care. The opposite is true in 2015 whereby the significant associations show that said age group was less likely to use inpatient care.

Gender variable is insignificant at 5% significance level with regards to association with outpatient care use in both years and with inpatient care use in 2013. Association between gender and inpatient care utilization become significant at 5% level in 2015. I interpret this to mean that one's gender does not necessarily have an association with health care use once wealth status, education, and age have been accounted for.

Moreover, I included interaction terms between age and gender to all regression models. The results indicate that for outpatient use both in 2013 and 2015, females belonging to the age group 19-36, 37-54, 55-74 are associated with higher utilization compared to their male counterpart. These results are significant at 1% level. Conversely, associations between females within the 75+ age group and outpatient care use in both years are insignificant at 5% level. Association between inpatient care use and age-gender interactions are all significant at 1% level though they depict a different pattern. Females who belong in the 19-36 and 37-54 age groups are associated with higher inpatient care utilization compared to males within the same age group. On the other hand, older females (i.e. those in the 55-74 and 75+ age groups) are associated with lower inpatient care utilization when compared to males who belong in the same age groups.

### ***Socioeconomic status variables***

Now I turn to the association of socioeconomic status with health care use, controlling for age and gender. Three different proxies for individual's wealth status were used in this analysis to see whether using different proxy will result in different estimated coefficients. When the population is ranked according to per capita expenditure or wealth index, all associations are significant at 1% level and portray the same pattern: compared to individuals in the lowest wealth level (i.e. very poor individuals), those belonging to higher wealth status use more outpatient and inpatient care both in 2013 and 2015. When using food

expenditure to rank the population, some associations become insignificant though they all still show that individuals who are better-off have higher utilization compared to the poorest individuals with respect to outpatient and inpatient care. Overall, the results suggest that wealthier individuals have higher health care utilization which are in line with the positive concentration indices I obtain from previous analysis.

There is a clear gradient in health care use relative to the effect of education. While those with higher education qualification have lower probability to use outpatient care compared to individuals with only elementary-level education qualification, the opposite holds for inpatient care use. That is, individuals with higher education qualification are more likely to use inpatient care compared to those with elementary-level education. Note that not all these associations are significant at 1% level. These results are not in line with the results obtained for wealth level above, whereby individuals with wealth level have higher utilizations for both outpatient and inpatient care. Furthermore, inclusion of individual's education level did not have significant impact to associations with other variables. A possible explanation is that one's education level does not necessarily have an association with health care use once wealth level is accounted for. That is, income level plays a greater role in individual's health care utilization compared to education level.

## 6. Conclusion and Discussion

In this section, the results presented in Section 5 as well as its policy implications are discussed. Moreover, some limitations and indications for future research are provided.

### 6.1 Conclusion

The main objective of this analysis is to assess whether the implementation of Jaminan Kesehatan Nasional, Indonesia's universal healthcare, had an impact on the distribution of health care utilization, particularly on socioeconomic status-related inequality in health care. Prior to this major healthcare reform, outpatient and inpatient care utilization was concentrated among populations who are better off. My analysis includes calculating concentration indices for the use of each of the two types of health care services and comparing said indices between a year prior to and following the implementation of said policy reform. Three different proxies for wealth level were used as measures of socioeconomic status. The results obtained indicate that the distribution of use for both types of health care services remained slightly pro-rich as shown by positive concentration indices in both years. It is worth noting that the point estimates in the year following the health care reform was lower compared to pre-JKN year. This observation holds for all results regardless of the ranking variable that was used inferring that the expansion of insurance coverage following the health care reform have improved the distribution of health care utilizations.

Moreover, I estimated regression models to substantiate the results from abovementioned analysis. The results indicate that age largely has a significant association with both outpatient and inpatient care utilization both pre- and post-JKN implementation while gender does not. Further, the estimates resulting from my regression models indicate that individuals with higher wealth level are associated with more outpatient and inpatient use in both years regardless of the variables used to rank the population. This confirms my findings above that distribution of health care utilization is pro-rich. Lastly, a more educated individual is associated with less outpatient care use and more inpatient care use when compared to an individual with only an elementary-level education background, though not all associations between education level and health care use are significant. This finding is not in line with the results obtained regarding wealth status above. I interpret this to mean that individual's education level does not necessarily have an association with health care utilization once wealth status is taken into account.

There are a number of limitations to my study. Firstly, the observed time frame only spans one year before and after the health care policy reform. Hence, I may not fully capture the effect of the health care reform on health care utilization. Within one year of a major reform such as this one, there could be many shortcomings when implementing said policy reform. For instance, there may be lack of socialization by the government with respect to changes in health care system, particularly to the poor population residing

in rural villages. Moreover, even if the local government is successful in enrolling the poor population in rural areas, it is likely that the primary care health centers or hospitals in these remote areas are not ready to cater the increase in demand of health care use. Hence, the overall effect that was captured during the first year of implementation does not fully reflect the impact of JKN on health care use.

Secondly, as I have mentioned previously, this analysis does not control for need variables given the lack of information on SUSENAS data set. In my opinion, the result of my analysis would not change significantly if I was to include individual's need-level. The results from my analysis show that concentration indices of outpatient and inpatient care use decrease following the implementation of universal health coverage indicating pro-rich inequalities in health care use. Should I replicate this study using need-standardized health care variables to obtain concentration index of health care inequity, I expect the resulting concentration index to also decline following the health care reform as health care need is expected to be concentrated among the poor population.

## **6.2 Policy implications**

The results from this analysis suggest that the implementation of universal health care coverage in Indonesia has improved the distribution of health care utilization although it is still concentrated among populations who are better-off. This implies that the reform is moving the health care system in the right direction, i.e. a more equitable system. However, there are still some steps that the government can take to further improve the distribution of health care utilization under the new system.

The main goal of the reform was to improve access of health care, especially among those who are poor or were previously uninsured. This will likely lead to an increase in demand for health care services. In order to have successful implementation, the government will have to improve the supply-side of health care. That is, ensuring that the number of primary health care centers, hospitals, and health care workers both in urban and rural areas are sufficient to meet the increase in demand. During the first year of implementation of JKN it is likely the case that the government did not focus on increasing the number of facilities, especially in rural areas, as they prioritized getting the poor population enrolled to BPJS Health. Thus, it could be the case that a poor person residing in a rural village who has successfully been enrolled to BPJS Class III coverage is unable to seek outpatient care due to a lack of a village-level primary health care center or poor access to a nearby hospital and instead will opt to see a local uncertified healer.

There is also the problem regarding the transition in switching from the local to the national health care system. Participants of the local health care scheme are supposed to be integrated to the national scheme within the first few years after the health reform. Thus, it is imperative for the central government to provide clear regulations and guidelines with respect to the integration of local health care scheme's

participants into the national scheme. Furthermore, even if participants are covered under a national scheme, provision of health care services at the local level still largely depends on the district-level government. Hence, it is also important for the Ministry of Health to work in sync with the district-level government to ensure that the quality of health care services is sufficient across the board.

Lastly, because of the increased health care coverage, an increase in government health spending is inevitable. Hence, it is important to ensure the long-term financial sustainability of this program. As mentioned previously, the government still has to make large investments to increase the number of health care facilities as well as improving access to existing hospitals (e.g. building more roads or adding public transport system). These additional investments, in addition to the provision of health care coverage to the poor and previously uninsured, will exert much financial burden to the government budget. Thus, they will need to set forth policies that will either increase government income or decrease government spending in other sectors in order to ensure the continuation of the universal health coverage.

### **6.3 Indications for future research**

As having an equitable health care system is becoming a more important agenda among policymakers, it becomes increasingly more important to understand the various elements needed to have as equitable a health care system as possible. For Indonesia, in particular, it would be useful to conduct a similar analysis as was done in this study but using need-standardized health care variables to see whether the condition of equal treatment for equal need is achieved. Moreover, it would also be useful to conduct a decomposition analysis of health care inequality and inequity in order to assess the contributions of both need and non-need variables. These will provide policymakers with insights regarding the greatest driver of health care inequity as well as which aspects of the health care system they will need to improve and work on.

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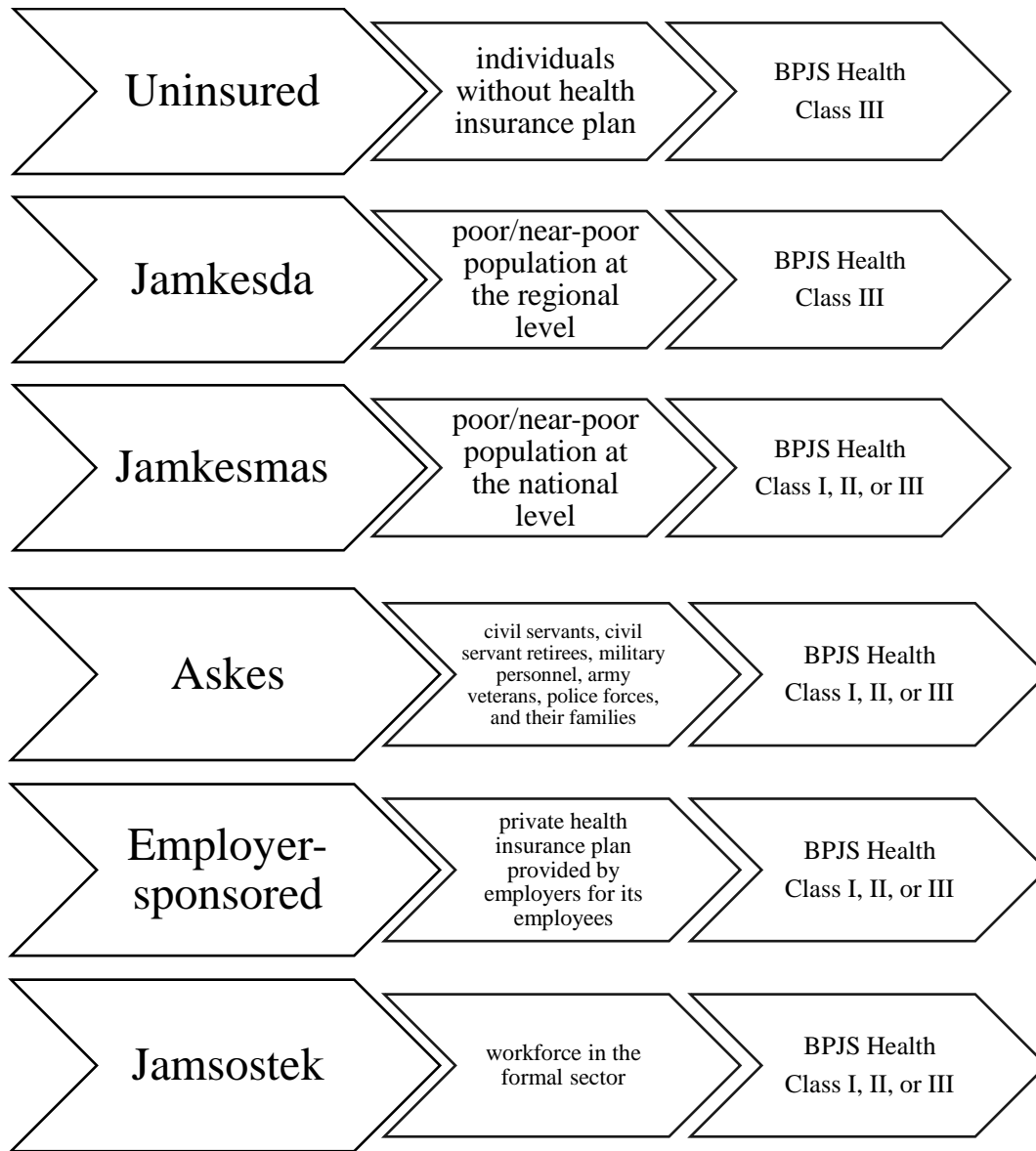


# Appendix

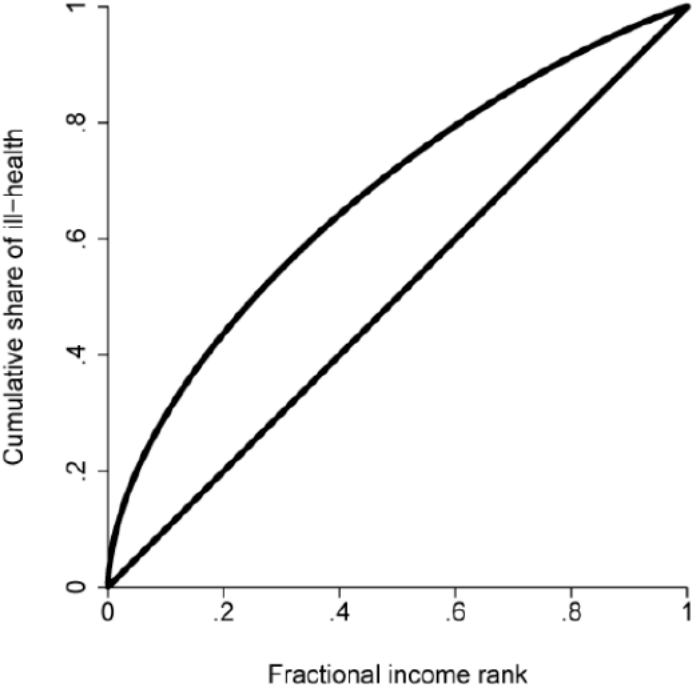
## Abbreviations

Askes	Asuransi Kesehatan, Health Insurance
BPJS	Badan Penyelenggara Jaminan Sosial, Social Security Administering Body
BPS	Badan Pusat Statistik, Central Bureau of Statistics
IDR	Indonesian Rupiah
Jamkesda	Jaminan Kesehatan Daerah, Regional Health Insurance
Jamkesmas	Jaminan Kesehatan Masyarakat, Community Health Insurance
Jamsostek	Jaminan Kesehatan Sosial, Workforce Social Security
JKN	Jaminan Kesehatan Nasional, National Health Insurance
PBI	Penerima Bantuan Iuran, Premium Assistance Recipient
Posyandu	Pos Pelayanan Terpadu, Integrated Care Service Center
Puskesmas	Pusat Kesehatan Masyarakat, Primary Health Care Center
SUSENAS	Survei Sosial Ekonomi Nasional, National Socioeconomic Survey
WHO	World Health Organizations

**Figure 1: Indonesia's Health Insurance market before and after JKN**



**Figure 2: Hypothetical Concentration Curve**



Source: O'Donnell et al (2016)