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REFORM OF THE SYSTEM OF PUBLIC HEALTH INSURANCE FOR THE POOR IN INDONESIA HAS OPPORTUNITY TO INCREASE HEALTH INEQUALITY: CONSIDERING DIFFERENT ACCESSIBILITY OF PUSKESMAS

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ABSTRAK

Though the Indonesian government reformed its public health insurance system for the poor since 2008, the country still faces challenges with the disparity of accessibility to community healthcare centres (Puskesmas). This study examines whether the 2008 healthcare system reforms increased health inequality of the poor. Using data from the RAND Indonesian Family Life Survey (IFLS) and The Village Potential Statistics (PODES), this study found an indication that, in the aftermath of the reforms, the gap widened in the tendency for the poor to make insurance claims depending on their level of access to healthcare centres. This indication can be seen from the result of baseline model where access to puskesmas is the main variable that affect public health insurance claim. It is also supported by the regression result using road infrastructure as indicator of access to puskesmas. Therefore, to protect the poor from catastrophic out-of-pocket expenditure, besides the provision of public health insurance, the government needs to be concerned about the accessibility of public health care, which includes not only the provision of direct healthcare infrastructure, but also improvement on the road access conditions.

Pemerintah Indonesia mereformasi sistem asuransi kesehatan publik untuk masyarakat miskin sejak tahun 2008 tetapi di sisi lain Indonesia masih menghadapi masalah kesenjangan akses terhadap pusat kesehatan masyarakat (Puskesmas). Penelitian ini menganalisis apakah reformasi sistem asuransi kesehatan publik di tahun 2008 justru meningkatkan kesenjangan kesehatan masyarakat miskin. Dengan menggunakan data IFLS dan PODES, penelitian ini menemukan indikasi bahwa setelah reformasi, gap kecenderungan untuk melakukan klaim asuransi kesehatan meningkat sesuai dengan level kemudahan untuk menjangkau puskesmas. Indikasi ini dapat dilihat dari hasil model dasar yang menggunakan akses ke puskesmas sebagai variabel utama yang mempengaruhi klaim asuransi kesehatan publik, dan juga didukung hasil regresi yang menggunakan infrastrukur jalan sebagai indikator akses ke puskesmas. Oleh karena itu, untuk melindungi masyarakat miskin dari pengeluaran katastropik, selain penyediaan asuransi kesehatan, pemerintah juga harus memperhatikan kemudahan menjangkau puskesmas, termasuk meningkatkan kualitas jalan untuk meningkatkan akses terhadap infrastruktur kesehatan.

1. INTRODUCTION

Healthcare is a concern for many governments around the world, who often invest large proportions of their budgets to provide public healthcare systems. Without public systems, access to healthcare would be very expensive if only provided by the private sector, and many would be unable to afford to keep healthy. When it comes to public healthcare systems, every country has a different scheme, budget allocation, and priorities. Some countries use public insurance as a tool to help their citizens afford healthcare, such as in China, the Philippines, Vietnam, and Thailand (Bredenkamp et al. 2015).

Over the past 14 years, the Indonesian government has been seeking to achieve universal health coverage (UHC) by improving its public health insurance scheme. A first step towards UHC was made in 2005 by launching the *Askeskin* program, a social health insurance program for the poor (Sparrow, Suryahadi, & Widyanti, 2013). This program became known as *Jamkesmas* in January 2008 and, finally in 2014, the government introduced *JKN* (Jaminan Kesehatan Nasional/The National Health Insurance), the merged of Jamkesmas and other fragmented health insurance program under administration of BPJS Kesehatan (Badan Penyelenggara Jaminan Sosial di bidang Kesehatan / Social Security Agency for Health).

Puskesmas (Pusat Kesehatan Masyarakat/ Community Health Centres), are vital public healthcare infrastructure in Indonesia. There is at least one puskesmas in every subdistrict (kecamatan), and they serve as the community's closest government clinic. The other key role of puskesmas is as a gatekeeper in public health insurance claims. However, Indonesia still has inequality in the distribution and accessibility of puskesmas. It is shown by Agustina et al. (2018) that the western regions of Indonesia have a higher coverage of puskesmas than in the eastern region and there are geographical gaps in local health indicators over the last ten years due to the inequity of health care delivery. It means that people have different levels of access to public healthcare facilities, thereby affecting the utilization of public healthcare.

A study by De (2014) found that the utilization of public health insurance has a strong correlation with the distribution of healthcare facilities. The more healthcare centres in the area, the more people make claims in the public insurance system. Thus, even though the newer public health insurance scheme in Indonesia (the Jamkesmas program) is growing larger and the procedure to make claims is becoming easier than the previous program (the Askeskin program), it has possibility that not all members of the public are receiving the same benefit, as many still live in areas that lack healthcare facilities and so cannot utilize the service. In other words, the development of the public healthcare system may have served to increase health inequality between people living in areas with abundant healthcare facilities and people living in areas with limited such facilities.

Accordingly, this research analyses whether the reform of the public health insurance system in Indonesia will increase health inequality, based on the relative decrease in public health insurance claims by the poor due to differences in access levels to the public health service centre (puskesmas) in each subdistrict.

2. THEORETICAL FRAMEWORK

2.1. Indonesia's Public Health Insurance Reform

Though the name of the public health insurance system in Indonesia has changed several times, its objective has remained the same: providing health insurance to the population of Indonesia and protecting individuals from economic shock related to health. Indonesian government started the system by helping the most vulnerable people, then expand the protection and the ultimate goal is to provide health service access to all citizen without financial hardship (Agustina et al. 2018). The objective of reforming the system was to protect the insured from the financial burden of healthcare costs by reducing out-of-pocket (OOP) healthcare payments (Rolindrawan, 2015). Figure 1 shows the OOP and health insurance coverage when the two schemes of Indonesian public health insurance for the poor were introduced.

Figure 1. OOP share of total health expenditure and health insurance coverage

Source: UNICO Studies

The ratification of SJSN (Sistem Jaminan Sosial Nasional/the National Social Security System) by Law No.40 in 2004, marked the commitment of the Indonesian government to promote UHC. Before 2004, the Indonesian public health insurance only covered civil servants (the Askes Program) and police and military (the Asabri Program). The path implementation of SJSN in achieving UHC started from the provision of public health insurance for the poor by Askeskin program in 2005. In 2007, provincial, district, and municipal government mandated to provide local health insurance to complement the Askeskin program

by the Jamkesda Program. However, this program was not popular until 2008, thus it was better known as the complement of the Jamkesda program. Three years later, the government expanded the insurance coverage not only for the poor but also for the vulnerable groups by the Jamkesmas program. In 2014, as the final phase of public health insurance reform in Indonesia, government launched JKN that aimed to have Indonesian people insured by the end of 2019. This program integrates the Jamkesmas, Jamkesda, Askes, and Asabri programs, and enhance coverage to all people that are previously uninsured.

The askeskin program is financed through the national budget and the fund was managed by a state-owned insurance enterprise PT Askes. Askeskin's application saw a nationwide rise in health insurance coverage from 10% of the total population in 2005 to 48% in 2008 Mahendradhata et al. (2017). Askeskin included non-contributory premiums for all health advantages and no cost sharing. This system did not, however, include treatments classified as luxury treatments. Based on the poverty list by BPS (Badan Pusat Statistik / Statistics Indonesia), beneficiaries of target askeskin were recognized. Fixed quotas were allocated to districts by the national government, and district were responsible for identifying the target beneficiaries.

The Jamkesmas fund was managed by the Ministry of Health (MoH) and was disbursed on the basis of capitation for puskesmas and submitted claims to health centres. In 2011, the puskesmas were also paid on a fee-for-service basis to improve the use of primary care services in data collection. Jamkesmas targeted low-income and vulnerable families and waived charges for almost unlimited use of accessible healthcare facilities in puskesmas and third-class wards in public hospitals and some private hospitals contracted.

Beside the wider coverage, the main reform from Askeskin to Jamkesmas was the financing management. In the Askeskin program, the puskesmas and public hospitals need to make claim to PT Askes after giving treatment to the beneficiaries while in Jamkesda program, the puskesmas and public hospitals had been directly transferred the fund before giving treatments to the beneficiaries. Therefore, in the Jamkesmas era, the public healthcare may deliver the service faster and better to the public insurance holder than in the Askeskin era.

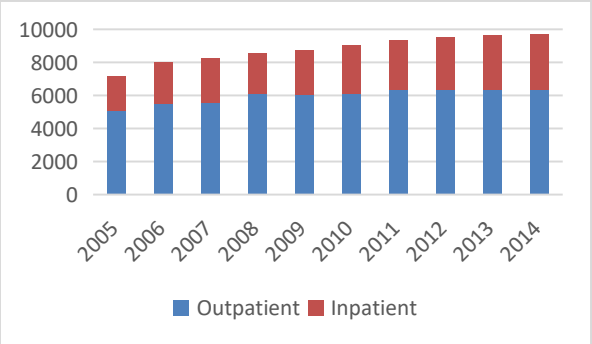
2.2. Puskesmas' Role In Public Health Insurance Claims

Puskesmas were point of departure for government investment in national health service. They were introduced in 1960, with the goal to provide the most fundamental level of access to healthcare for all citizens (Pisani et al. 2017). The government succeeded in rapidly building up health infrastructure, from zero puskesmas in 1960 to 20,900 in 2001 (Agustina et al. 2018). Similarly, the government's target for all people to have access to puskesmas was also quickly achieved, and by 1970 they had been established in every subdistrict in the country. Puskesmas have played an essential role in enhancing Indonesian health status, though services provided by puskesmas are not free, the government has kept the charges low (Pisani et al. 2017).

As community health centres, puskesmas serve as Indonesia's main and basic level healthcare facilities in Indonesia. The patient path begins with the puskesmas, which also function as patient gatekeepers before being referred for further treatments in hospitals. It means, puskesmas is a gatekeeper to claim the benefit of public health insurance. As informed by Mahendradhata et al. (2017), a patient with public health insurance is not permitted to seek health treatment straight in specialist clinic or hospital without a referral letter from a puskesmas, except in an urgent condition.

For the poor, puskesmas are even more important than private healthcare. Since it is provided by the government, the facility is more affordable. Rolindrawan (2015) found that puskesmas are the healthcare service for outpatients that is most used by the low-income and vulnerable-income people in Indonesia. The MoH (2014) states in Law No. 75 2014 that the function of puskesmas is as a first level of health service guard for people and individuals to support the health community in each subdistrict. There are two types of puskesmas. The first type provides only outpatient care, while the second type provides both inpatient and outpatient care, known as inpatient puskesmas. The Government of Indonesia has increased the number of puskesmas every year as health service demand increases along with the size of the total population. Figure 1 depicts the increasing number of puskesmas from 2005 to 2014.

Figure 2. The number of puskesmas in 2005-2014



Source: MoH 2007, MoH 2009, MoH 2014

2.3. Health Centre Inequality

Nevertheless, the quality of puskesmas vary in each region of Indonesia, leading in disparities in the level of service between different regions. Added to this, their distribution is not equal across every

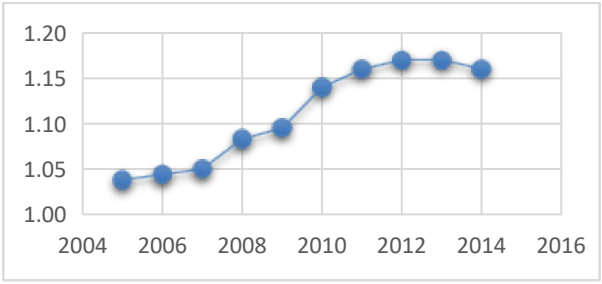
province. For example, according BPS (Badan Pusat Statistik / Statistics Indonesia) data in 2015, there are 1,050 puskesmas in West Java but only 176 in Jambi. Though each province has a different total population to be covered by puskesmas services, these numbers reflect the disparity of public healthcare service in Indonesia.

The disparity of public health facilities also emerges at the regency (kabupaten) level. Even on Java island, which is the most developed of the islands, differences of availability still exist. Referring to the 2015 BPS data, in Central Java there are 39 puskesmas in Banyumas Regency but only 12 in Sukoharjo Regency. This disparity also exists on other islands. For example, in Nusa Tenggara Barat province, there are only 9 puskesmas in Sumbawa Barat Regency, but there are 29 puskesmas in Lombok Timur Regency. Though by area the two regencies are almost identical in size – Sumbawa Barat Regency is 1,637 km^2 and Lombok Timur Regency is 1,606 km^2 – there exist variations in the accessibility of health centres, which means that people in Sumbawa Barat have overall poorer access to healthcare than people in Lombok Timur.

Mahendradhata et al. (2017) stated that Indonesia has a five-km-distance-average to reach healthcare service but for some eastern provinces like Papua, West Papua, and Maluku, the average distances are more than 30 km. This broad differences in the average distance will associated to travel time to reach a public healthcare service. MoH (2013), in Riskesdas (Riset Kesehatan Dasar/ Indonesia Basic Health Research) 2013, informs that on average around 18 percent population of Indonesia need more than 60 minutes to reach a public hospital, but in some areas such as West Kalimantan and Maluku, the population that faced this obstacle are more than 40 percent. MoH (2013) added that puskesmas are easier to reach than government hospitals but the people of some eastern provinces need more time to reach the puskesmas.

MoH (2014) has claimed that, at the national level, puskesmas have covered the health needs of every region. Figure 2 shows the puskesmas ratio per 30,000 individuals from 2005 to 2013 increased from 1.39 to 1.17, and slightly decreased 0.01 point in 2014. This means, on average, that one puskesmas provides healthcare for 30,000 people. However, this ratio is different at the regional level. Papua Barat consistently had the biggest ratio and Banten consistently had the lowest ratio among the provinces in 2007, 2009 and 2014 (MoH 2007, MoH 2009, MoH 2014). This, however, does not mean that Papua Barat has the best coverage of all provinces; instead, it has a very large area with low density of population.

Figure 3. Puskesmas ratio per 30,000 individuals 2005-2014



Source: MoH 2007, MoH 2009, MoH 2014

2.4. Factors Affecting Healthcare Utilization

The more people utilise health care centres, the more benefits they claim from the public insurance system. Therefore, we use factors affecting healthcare utilization as proxy for factors affecting public health insurance claims.

2.4.1 Geographical accessibility

Inequalities in accessibility of healthcare service is inevitable due to the disparity distribution of healthcare facilities. Tanser et al. (2006) state that geographical access to healthcare facilities has been extensively demonstrated to have a direct impact on their use. It also has been shown that proximity to care is a significant determinant of a wide range of health results. Tanser et al. (2006) noted that a greater distance to healthcare service has been correlated with increased infant and maternal mortality. Furthermore, they say that proximity to care, on the other hand, is linked to a growing frequency of utilisation of healthcare service. Consequently, enhancing geographical accessibility of community health care can have a direct impact on enhancing negative health results.

Strasser et al. (2016) suggested that road infrastructure and transportation options are crucial to the pattern of healthcare utilization. Manjia et al.'s (2018) study on inequalities in physical access to healthcare service in Yaounde, Cameroon, found that this access is subject to restrictions including spatial accessibility, creating inequalities that not only constitute a disability to government healthcare service, but are also becoming a cause of political grievances among victims.

2.4.2 Socio-demographic factors

There have been many studies shown that socio-demographic variables influence the use of community healthcare facilities. In this study we will include five variables of respondents' socio-demographic characteristics: gender, age, education, economic status, and household size.

2.4.2.1 Gender and Age

Gender and age have been found to have a correlation with the utilization of healthcare services. Females have higher health risks than men, and older

people require greater access to healthcare services due to their increased probability of having chronic diseases and declining health status. Some scholars have shown that gender and age significantly affect the utilization of healthcare (Freeman & Corey 1993, Sparrow et al. 2013, Aji et.al 2013, Rolindrawan 2015).

2.4.2.2 Education

Some studies have found that the utilization of healthcare services is determined by education level. A study by Dodd et al. (2016) found that low rates of health literacy may a source of insufficient, incomplete or delayed seeking for medicine and treatment, that could affect unwanted health results, chronic diseases, unneeded financial expenses, and increased susceptibility to future diseases. This may due to people with low health literacy levels will only seek for care when their pain disturbs their daily works. Another study by Ahmed et al. (2010) shown that women's education is one variable that affect maternal health care and maternal survival seeking behaviours.

2.4.2.3 Economic status

Some studies found that economic status is associated with care-seeking behaviour. Lower-income groups are more restricted by financial expenses and thus have less probability in seeking care from more remote centres regardless of quality of care variations or of the other socio-demography variables (Tanser et al. 2006). Furthermore, the consumption of healthcare is subject to price and income effects (Grignon et al. 2008). Another study found that one of variables affecting maternal health care and maternal survival seeking behaviour is the wealth of household (Ahmed et al. 2010)

People with public health insurance must still consider economic factors when accessing health services as they still have to shoulder costs not directly related to treatment, such as transport expenses. Sparrow et al. (2013) found that the coverage of Askeskin, particularly in metropolitan regions, appeared to boost OOP expenditures and shares of household budget. This indicates that people with Askeskin still had to bear some of the expenses of enhanced use of healthcare service. In addition, WHO (2018) has shown that in Bangladesh, unofficial charges often exist for "free services". These illegal charges have an enormous impact on the low-income people, who are less likely to ask the supplier or comprehend the healthcare procedures.

2.4.2.4 Household size

The number of people in the household is another factor that accounts for the decision of individuals to utilise healthcare services. When people go to healthcare facilities, they may consider help from other family members either to accompany them or to take care of other things such as the home or business, and child or animal care (Strasser et al. 2016). Furthermore, when one family member accesses healthcare benefits, this experience could increase the chance of other family members also accessing these services (Aji et al. 2013)

2.4.3 Health status

People visit healthcare centres for many purposes, from health prevention to curative action. Generally, though, the better health condition of a population, the less need there is for healthcare. Self-reported health status and chronic condition are indicators that are commonly used as proxy for health status variable. Freeman & Corey (1993) used these proxies and found that the results were significant. A disruptive illness is used by Sparrow et al. (2013) as indicator of health status. Another research project by Aji et al. (2013) included two indicators: activity of daily living and self-generated health status, to represent health status in their model.

3. DATA AND METHODOLOGY

3.1. Data

This study uses two sources data: the Indonesian Family Life Survey (IFLS) and Village Potential Statistics of Indonesia (PODES / Potensi Desa). IFLS is an ongoing longitudinal survey undertaken by RAND in Indonesia in cooperation with Lembaga Demografi, Gadjah Mada University and, previously, the University of Indonesia. The sample represents approximately 83 percent of the Indonesian population and includes more than 30,000 people residing in 13 provinces across the nation. PODES is conducted by survey three times every decade by Statistics Indonesia, or Badan Pusat Statistik (BPS), and provides information about regional characteristics and infrastructure up to the village/desa level, including information on the health sector.

The datasets used in this study are from IFLS wave 4, IFLS wave 5, PODES 2008, and PODES 2014. Though the IFLS collects information at both the individual and household level, our use data from the individual level to investigate the behaviour of the smallest unit of decision makers. The respondents of IFLS wave 4 and IFLS wave 5 are above fifteen years old and hold public health insurance. The fifth wave (IFLS5) survey was conducted in 2014 and 2015, and the fourth wave (IFLS4) survey was conducted in 2007. Statistics Indonesia conducts PODES survey every year that ends with "1", "4", and "8". Therefore, we use the year that closest to the year of the IFLS survey in the fifth and fourth wave, which are PODES 2008 and 2014, respectively.

The Askeskin scheme was launched in 2005 and was reformed into Jamkesmas in 2008. While the fourth wave of the IFLS survey was undertaken in 2007, Indonesia's health public insurance was therefore the

Askeskin program, and during the fifth IFLS wave in 2014-15, the health public insurance scheme was the Jamkesmas program. Jamkesda was introduced in 2007 but questions about Askeskin did not exist in the fourth wave of the IFLS survey, instead, they only existed in the fifth IFLS wave. JKN was introduced in 2014 but JKN holder in the fifth IFLS wave is less than 25 percent of Jamkesmas/Jamkesda holder, moreover we cannot distinguish that the JKN holder are individuals that previously held Jamkesmas, Jamkesda, Askes, Asabri or others. Therefore, in this study, we analyse the data of the Askeskin program in 2007 and the Jamkesmas/ Jamkesda programs in 2014.

3.2. Variables

3.2.1 Claims

Claims are represented by the information from respondents' use of public health insurance to receive health services in puskesmas or public hospitals, as both outpatients and inpatients. This data is derived from the IFLS. For outpatients, the data was gathered from respondents who visited puskesmas and public hospitals in last four weeks without out-of-pocket payments, and/or respondents who visited puskesmas and public hospitals who used public health insurance. For inpatients, the data was gathered from respondents who went to puskesmas and public hospitals in the last 12 months without out-of-pocket payments, and/or respondents who visited puskesmas and public hospitals who used public health insurance. The measurement of claims used binary categories of 1 for claims and 0 for otherwise, rather than the actual claim amount in rupiah, because many respondents answered 'don't know', or the data of rupiah was reported as zero even though the respondent claimed they had used public health insurance.

3.2.2 Access

The variable 'access' accounts for the level of ease for people to reach puskesmas, and is taken from PODES data. The measurement is categorical from 1 to 4, representing very easy, easy, difficult, and very difficult, respectively. This measurement is gathered from the perspectives of village heads and village officials by considering the distance of puskesmas from the village, road conditions, and available transport (Statistics Indonesia, 2014). Village heads and officials are trusted to have knowledge about the condition of their villages.

3.2.3 Age, Gender, Education, Household size

The 'age, gender, education and household size' variable is taken from data from the IFLS. Age uses a continuous measurement, in years old. Gender is a dummy, where 0 represents males and 3 represents females. Education uses a continuous measurement of years of schooling, obtained by converting highest education attainment to the general length of years of schooling in Indonesia – for example, six years for primary school, three years for secondary school, and four years for a bachelor's degree. Household size uses a continuous measurement of the number of family members in the household.

3.2.4 Economic status

Instead of income, this study uses per capita expenditure as a proxy of economic status. The decision to use this proxy was made for two reasons. Firstly, people are usually reluctant to answer questions about income, and that could affect respondents' answers, leading them not to provide accurate information about income. Secondly, Hidayat et al. (2004) suggested that expenditure is a more reliable indicator than income for low and middle-income people as a measurement of living standards. Per capita expenditure is obtained by total food and non-food expenditure divided by household size.

3.2.5 Self-reported health status

The measurement of self-reported health status is based on the subjective assessment of respondents' health status. For this variable, the questionnaire in the IFLS asked respondents to assess their current health condition from 1 to 4, which indicated very healthy, somewhat healthy, somewhat unhealthy, and very unhealthy, respectively.

3.2.6 Chronic conditions

The respondents to the IFLS were asked if they were suffering from one or more chronic diseases. There is a list of sixteen such diseases, and thus respondents could have a chronic disease value from zero to sixteen. A previous study by Freeman et al. (1993) used a natural log of the number of the individuals' chronic diseases plus 0.1. However, in this study we use a binary measurement of 0 for those who do not have a chronic condition(s), and 1 for those who have any chronic condition(s), since the dependent variable used binary measurement. Though this dependent variable cannot capture the different frequency of claims of people with more chronic diseases, people with two chronic diseases do not necessarily claim twice more than people with one chronic disease.

3.3. Methodology

Since the dependent variable in this study uses binary categories, the estimation model that we use is a logit function. Wooldridge (2010) stated that a logit model can be used to overcome the limitations of a binary dependent variable in linear probability model (LPM). A logit model guarantees that the probability of a dependent variable will not be less than zero or greater than one, which cannot be achieved through a LPM. A study by Rolindrawan (2015) also used a logit model to compare the behaviour of insured and uninsured people in choosing public and private healthcare services between the Jamkesmas and JKN

periods in Indonesia.

The general form of logit function is:

$$L_i = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_1 + \beta_2 x_i + \mu_i$$

The logit function for 2007 is:

$$L_1 = \ln\left(\frac{p_1}{1-p_1}\right) = \beta_1 + \beta_2 Access_1 + X_1\theta'$$

Where p_1 is the probability of claims in 2007, $Access_1$ is the degree of ease in reaching puskesmas in 2007, and $X_1\theta'$ is a vector of sociodemographic characteristics and health statuses that likely have impacts on decisions to use healthcare services or claim public health insurance in 2007.

The logit function for 2014 is:

$$L_2 = \ln\left(\frac{c}{1-p_2}\right) = \gamma_1 + \gamma_2 Access_2 + X_2\theta'$$

Where p_2 is the probability of claims in 2014, $Access_2$ is the degree of ease in reaching puskesmas in 2014, and $X_2\theta'$ is the vector of sociodemographic characteristics and health status that likely have impacts on decisions to use healthcare services or claim public health insurance in 2014.

4. RESULTS

4.1. Descriptive analysis

The tables of the the summary statistics of the binary and continuous variables, the distribution of health insurance holder across category of puskesmas access, and the distribution of claims across categories of puskesmas are shown in Appendix A.

4.1.1 The summary statistics

In 2007, from the 1,374 respondents, only 9.7 percent claimed insurance; 52.4 percent were women; the average age was 44 years old; the average years of schooling was 6.6 years; and 32.5 percent of respondents had a chronic condition(s). In 2014, from the 7,159 respondents, 10.4 percent had claimed insurance; 54.5 percent were women; the average age was 38 years old; the average years of schooling was 8.5 years; and 33 percent of respondents had a chronic condition(s).

4.1.2 The distribution of health insurance holder across category of puskesmas access

The coverage of public health insurance holders increased significantly over the seven years between IFLS surveys; an increase of more than 400 percent, or four times, from 2007 to 2014. Distributions in the category of accessibility of puskesmas in 2007 and 2014 are quite similar. The biggest portion of the distribution was in the 'easy' category, followed by 'very easy', 'difficult', and 'very difficult', respectively. Interestingly, the distribution of the last category, 'very difficult', was very low: it was zero in the 2007 Askeskin era, and only 0.5 percent in the 2014 sample. There are several possibilities to explain this occurrence: the inadequate geographical distribution of the insurance scheme meaning that it did not reach remote areas; the quality of transportation and road infrastructure was reliable, and thus most puskesmas in Indonesia are actually readily accessible; or the areas with populations that found access to healthcare centres to be very difficult were not captured by the sample. Of these explanations, the most likely is the last, because the sample of respondents to the IFLS are mostly from the western regions of Indonesia. The survey did not cover some eastern regions, for example Papua. As mentioned in section 4, Papua Barat has a higher ratio of puskesmas per 30,000 people, but because it has a very large area, the distance between puskesmas is also relatively large. In addition, overall the infrastructure in the western region is better than in the eastern region.

4.1.3 The distribution of claims across categories of puskesmas

In 2007, the highest percentage of claims was in the "difficult" category. This could be because insurance holders in this category are few, and thus the increment of one person's claim results in a high additional percentage. In 2014, the percentage pattern of claims was better than the 2017 pattern. This follows the common sense that the easier puskesmas are to reach, the more people will make claims. In 2014, the biggest percentage was from the 'very easy' category and the lowest was from the 'very difficult' category. The trend of claims in the 'very easy' category increased by almost 3 percent.

4.2. Estimation results

In this study we conduct four estimation models. The first model is a baseline model, including all independent variables explained in section 3. This model is intended to answer the research question in this study. Meanwhile, the other three models – interaction, province dummies, and indicator of access – are conducted to support recommendations for the Government of Indonesia in the health sector. The regression analysis results are displayed in Appendix B.

4.2.1 Baseline model

The result of the baseline estimation model with a logistic regression shows that not all variables had a significant result. Even though the main independent variable was not significant in 2007, most other variables were significant. In 2014, two categories of the main independent variable were significant and other variables were mostly all significant. All variables had consistent significance in both the Askeskin and Jamkesmas/Jamkesda eras, except for access and

education.

The odds ratio of the access variables in the Askeskin period was counter to expectations: there was a higher tendency of people living in areas in which it was 'easy' and 'difficult' to access public health insurance than people living in 'very easy' access areas. In 'easy' regions this tendency was only a slightly larger value, but in 'difficult' regions it was one and a half times the 'very easy' value. However, this estimation result is not significant, and may be attributable to the problem of distribution of Askeskin. Sparrow et al. (2013) informed that in the first year, individuals could also claim the benefit of Askeskin program using an obsolete social security health card and a poverty status letter that is issued by village officials. Another reason is that the Askeskin cards were not always distributed properly to every eligible person, and officials sometimes distributed them according to people's health conditions, with sicker individuals given priority in receiving insurance cards. It may be that a greater proportion of people in 'easy' and 'difficult' areas were given this priority, and thus the tendency to claim insurance benefits was higher than the tendency in 'very easy' areas (Aji et al. 2013).

At the time of the Jamkesmas/Jamkesda system, the tendency to claim decreased when difficulty of access to puskesmas increased. This phenomenon is explained by the odds ratio of the estimation result. Individuals that lived in category 2 areas, with 'easy' access, had a tendency to claim insurance that was 0.78 times greater than people living in 'very easy' access areas. The tendency was slightly higher in the third category than in the second category. The tendency of individuals living in 'difficult' access areas to claim was 0.82 times the tendency of those who live in first category, and was significant at 18 percent. For the last category, the odds ratio shows that, because of the very poor condition of accessibility to puskesmas, the tendency to access them was only 0.59 times the level of people living in areas with very good accessibility, though it was not significant.

To answer the question of this study, we compared the tendency of each category of access in both periods. In the Askeskin period, though the results were not significant, the regions with worse access had a higher tendency to claim than the 'very good' areas, while in the Jamkesmas/Jamkesda period the worst access regions had a lower tendency to claim that the 'very good' areas. In 2014, the better access areas people lived in, the higher the possibility there was to claim, and the results were significant. This shows that the gap of tendency to claim between good access areas and bad access areas become wider from 2007-2014. The puskesmas and public hospitals that managed the insurance funds in the Jamkesmas/Jamkesda period could give better and quicker healthcare services than when the fund was handled by the state-owned insurance firm PT Askes in the Askeskin period.

Socio-demographic variables were significant in both periods, except for per capita expenditure and education in 2014. The tendency of female claims was 1.3 times the tendency of males in 2007, and this tendency was even higher in 2014, when females had a tendency to claim that was twice that of males. The improved claim procedures may have increased the confidence of women to use their insurance cards. Age variables accounted for almost the same tendency to claim in both periods. Surprisingly, the education variable, or years of schooling, was significant in 2007 but not significant in 2014. Per capita expenditure was not significant in either period; a finding in line with the results of Sparrow et al. (2013), who found that the need for healthcare is explained by the socio-demographic characteristics of households, but not by their level of income. The last socio-demographic variable, household size, was significant in both periods. This implies that other family members are important in Indonesia in supporting each other to seek healthcare.

The health condition indicator results were significant in both periods, except for the self-reported health status variable in the 'somewhat healthy' category. The tendency to claim for people with worse heath conditions was higher in the Askeskin period than in the Jamkesmas/Jamkesda period. In 2007, people reporting a 'somewhat unhealthy' condition had a tendency to claim 2.7 times the tendency of 'healthy' people, but in 2014 this tendency was only 1.9 times. Furthermore, in 2007, people with an 'unhealthy' condition had a tendency to claim 5.3 times the tendency of "healthy" people, but in 2014 this tendency was only 3.2 times. The chronic condition variable was significant in both periods, and the tendency increased. The tendency of a person with a chronic condition(s) to claim was 1.7 times higher than people without a chronic disease in the Askeskin period, and this tendency grew to 2.6 times in the Jamkesmas/Jamkesda period.

4.2.2 Interaction between health conditions and accessibility of puskesmas

All health condition indicators were significant in both insurance schemes (Askeskin and Jamkesmas/Jamkesda). Furthermore, we were interested to examine whether the impact of health conditions and access to puskesmas is different if we include the interaction between these variables. Generally, people will have a lower tendency to seek healthcare even when they have severe health conditions if access to healthcare services is not easy. Below are the results of interaction between access and self-reported health status and between access and chronic condition(s) variables.

For 2007, the interactions made access category 3 ('difficult'), which was not significant in the baseline model, become significant, and the only interaction that had a significant result was between access

category 3 and chronic condition(s). Individuals with a chronic condition(s) who lived in 'very difficult' access areas had a tendency to claim insurance benefits 0.05 times the tendency of people without a chronic condition(s) who lived in 'very good' access areas. This result indicates not only that the tendency to claim of people with a chronic condition(s) are different to people without a chronic condition(s), but also that the accessibility of puskesmas matters when people live in 'very difficult' access subdistricts. On the other hand, the interaction results between access and self-reported health conditions were not significant. These results indicated that the behaviour to seek healthcare based on self-reported health status does not depend on the accessibility of healthcare.

For 2014, the only category of access that was still significant from the basic model in this interaction model was category 2 ('easy'), but there was no result of interaction between access and self-reported health status, or between access and chronic condition(s) that was significant. This indicates that the behaviour to seek healthcare based on self-reported health status and chronic condition(s) does not depend on accessibility of healthcare.

4.2.3 Province Dummies

To check whether health seeking behaviour is different in every province, we conducted a regression of the baseline model plus province dummies, with Aceh province as the base. For 2007, all province dummies results were not significant. This result means that, after we control the model with the variables in the baseline model, health seeking behaviour in every province is the same. For 2004, some province dummies results were significant, such as: Banten, DI Yogyakarta, Jawa Barat, Jawa Timur, Lampung, Sulawesi Selatan, and Sumatera Selatan. This indicates that the health seeking tendencies in those provinces were different to the tendency in Aceh. These different tendencies might be explained by different province-level policies and treatment of the Jamkesda card: some regions let people claim Jamkesda benefits by using the SKTM card; Purbalingga province offers to share costs for expensive treatment; Sumatera Utara covers expensive cancer treatments; and Aceh covers travel costs (Aspinal 2014). Sparrow et al. (2017) also found that there was heterogeneity impact of Jamkesda on healthcare utilization because of its variation design characteristic, such as: coverage, benefit packages and provider contracting.

4.2.4 Road infrastructure as an indicator of accessibility of puskesmas

The determinants of the access category are distance, road infrastructure, and transport choice from a village to puskesmas. Of these three aspects, road infrastructure has the greatest influence, because road infrastructure will affect the choice of vehicles that can be used, and distance matters less when road infrastructure is good. Therefore, we use road infrastructure as the indicator of access. Using road infrastructure data from PODES 2008 and PODES 2014, we regressed the baseline estimation by substituting the access variable to the road variable, to analyse whether road infrastructure has an impact on the utilisation of puskesmas and public health insurance claims. The road variable is a categorical variable from 1 to 3 that indicates if the road infrastructure within a subdistrict is paved/concrete road, stone and gravel road, and dirt road, respectively.

Table 8 in Appendix B presents the results of road infrastructure as an indicator of accessibility of puskesmas. Road quality was significant in affecting tendency to claim public insurance in both years. In 2007, people living in subdistricts where most road infrastructure was stone/gravel roads had a tendency to claim the insurance 0.429 times the tendency of people living in subdistricts where most road infrastructure was paved/concrete. In 2014, the tendency was 0.735 for stone/gravel roads and 0.468 for dirt roads. This tendency follows the expectation outlined above: the better the road, the higher tendency people have to claim health insurance. Therefore, improving health status is not only a responsibility of the Ministry of Health, but also of other institutions that manage road infrastructure.

5. CONCLUSION AND RECOMMENDATION

Since 2005, the Indonesian government has provided public health insurance for the poor. The aim of this insurance system is to protect the poor from catastrophic out-of-pocket expenditure because of illness. Since that time, the government has kept improving the coverage of the insurance system. In 2008, the government reformed the public health insurance scheme, moving from the Askeskin program to the Jamkesmas/Jamkesda program. Within this, the chief reform was in the management of funding that was previously handled by state-owned insurance firm PT Askes. This fund management was transferred to a directly distribution model through puskesmas and public hospitals. The purpose of the reform was to allow puskesmas and public hospitals to provide a better and faster service, with the hope that the process to claim public insurance for the poor would become easier.

On the other hand, Indonesia has faced challenges with an inequality of infrastructure, including health infrastructure. The accessibility of public healthcare is different in each subdistrict. Therefore, with an easier method for the poor to claim health insurance benefits and differing levels of access to public healthcare, there is a possibility that, after the insurance system reform, people in good access subdistricts claimed more often, while people with poor access could not utilise the

system because of obstacles in reaching healthcare infrastructure.

This study analysed whether the health inequality of the poor increased in the aftermath of the public health insurance scheme reform and the differing accessibility to puskesmas in Indonesia. Using fourth and fifth wave IFLS data and PODES data from the years 2008 and 2014, we regressed the logit estimation and found that in 2014 people living in areas with worse access had a lower tendency to make insurance claims, and this is statistically significant, while in 2007 people living in areas with worse access had a higher tendency to claim, but this was not significant. These results indicate that the gap in tendencies to make claims between good access areas and bad access areas was wider in 2014 than in 2007. Therefore, to increase health quality without ignoring health equality, besides simply providing public health insurance the government needs to give attention to improving the accessibility of public health care.

From the province dummies regression, the results showed that, in 2014, the different provinces had different tendencies to make claims. This result may have been caused by the fact that the procedure to claim Jamkesda benefits is different in every province. Though local governments are given authority to manage the health sector, the national Indonesian government therefore needs to implement a single standardised procedure for making health insurance claims, to ensure that access is fair and equitable for all of the population, regardless of location.

Additionally, from the indicator access regression, we found that road infrastructure has a significant impact on public health insurance claims for the poor. Therefore, the government needs to be concerned with improving road infrastructure to support the public health insurance program.

6. LIMITATIONS

This study has several limitations. The first limitation is the measurement of the dependent variable. Since there were limitations in respondents' answers in regards to insurance claims, we used a binary measurement, 'claim' and 'not claim'. We therefore did not differentiate different claims per individual in nominal payment or frequency of visit to doctors. The data also only provided patients' last visit to outpatient and inpatient treatment that used public health insurance or not. Moreover, there were many respondents who used the Askeskin or Jamkesmas/ Jamkesda cards but could not provide the rupiah amount of their claims.

The second limitation is that the measurement of the main independent variable is based on a subjective valuation from village heads and officials on how easy it is to access puskesmas from their village. Even though these officials have good knowledge and understanding about their village and their information can be considered reliable, there is a lack of objectivity in the data. Therefore, for future research it will be better to use an objective measurement, for example by finding a formula to measure an accessibility index. Furthermore, future study also can analyze health inequality in Jamkesmas/Jamkesda era compare to health inequality in JKN era.

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APPENDIX A: DESCRIPTIVE ANALYSIS

Table A1. Summary statistics of variables in 2007

VARIABLES	(1) Obs	(2) Mean	(3) Std. Dev.	(4) Min	(5) Max
Claim	1374	0,0967977	0.2957897	0	1
Gender	1374	0,5240175	0,4996047	0	1
Age	1374	44,78821	11,52303	16	94
Education	1374	6,657205	1,742227	6	16
Per capita expenditure	1374	404861,9	1872451	25119,05	927491,7
Household size	1374	6,62591	2,829678	1	17
Chronic condition	1374	0,3253275	0,4686677	0	1

Table A2. Summary statistics of variables in 2014

VARIABLES	(1) Obs	(2) Mean	(3) Std. Dev.	(4) Min	(5) Max
Claim	7159	0,1043442	0,3057279	0	1
Gender	7159	0,5449085	0,4980139	0	1
Age	7159	38,77092	19,74236	18	98
Education	7159	8,521442	2,902256	6	16
Per capita expenditure	7159	612994,4	708042,3	24037,88	993383,4
Household size	7159	6,745775	3,319179	1	25
Chronic condition	7159	0,330074	0,4702723	0	1

Table A3. The distribution of health insurance holder across category of puskesmas access

Access	2007		2014	
	Askeskin holder	%	J/J holder	%
Very easy	319	23.22	1222	17.07
Easy	1023	74.45	4977	69.52
Difficult	32	2.33	924	12.91
Very difficult	0	0	36	0.50
Total	1374	100	7159	100

Table A4. The distribution of claims across categories of puskesmas

Access	2007			2014		
	Claim	Not Claim	% Claim	Claim	Not Claim	% Claim
Very easy	32	287	10.03	159	1063	13.01
Easy	97	926	9.48	496	4481	9.96
Difficult	4	28	12.50	89	835	9.63
Very Difficult	0	0	0	3	33	8.33
Total	133	1241	9.67	747	6412	10.43

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APPENDIX B: REGRESSION RESULTS TABLES

Table B1. Baseline estimation results

	(1)	(2)
	m01	m02
VARIABLES	claim	claim
Access of puskesmas = 2, Easy	1.053	0.780**
	(0.816)	(0.015)
	0.234	0.080
Access of puskesmas = 3, Difficult	1.502	0.819
	(0.489)	(0.173)
	0.883	0.120
Access of puskesmas = 4, Very difficult		0.595
		(0.404)
		0.370
Sex = 1, Female	1.367	2.010***
	(0.109)	(0.000)
	0.267	0.176
Age	1.023***	1.000
	(0.006)	(0.878)
	0.008	0.002
Education	1.125**	1.011
	(0.020)	(0.490)
	0.057	0.015
Per capita expenditure	1.000	1.000
	(0.276)	(0.629)
	0.000	0.000
Household size	1.047	1.031**
	(0.146)	(0.011)
	0.033	0.012
Self-reported health status = 2, Somewhat healthy	1.219	0.973
	(0.680)	(0.823)
	0.587	0.120
Self-reported health status = 3, Somewhat unhealthy	2.751**	1.922***
	(0.040)	(0.000)
	1.356	0.247
Self-reported health status = 4, Very unhealthy	5.317**	3.239***
	(0.020)	(0.000)
	3.833	0.727
Chronic condition= 1	1.756***	2.612***
	(0.004)	(0.000)
	0.345	0.221
Constant	0.004***	0.037***
	(0.000)	(0.000)
	0.004	0.009
Observations	1,374	7,104

P value in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Table B2. Estimation results with interaction

	(1)	(2)
	m01	m02
VARIABLES	claim	claim
Access of puskesmas = 2, Easy	0.869	0.541**
	(0.850)	(0.152)
Access of puskesmas = 3, Difficult	13.838*	0.741
	(19.199)	(0.266)
Access of puskesmas = 4, Very difficult		2.136
		(1.703)
Sex = 1, Female	1.370	2.004***
	(0.270)	(0.176)
Age	1.023***	1.000
	(0.008)	(0.002)
Education	1.128**	1.010
	(0.057)	(0.015)
Per capita expenditure	1.000	1.000
	(0.000)	(0.000)
Household size	1.046	1.031**
	(0.033)	(0.012)
Self-reported health status = 2, Somewhat healthy	1.062	0.851
	(0.838)	(0.225)
Self-reported health status = 3, Somewhat unhealthy	1.704	1.345
	(1.387)	(0.378)
Self-reported health status = 4, Very unhealthy	10.462*	1.584
	(13.156)	(0.720)
Chronic condition = 1	2.303**	2.494***
	(0.941)	(0.454)
1b.access#1b.healthcon	1.000	1.000
	(0.000)	(0.000)
1b.access#2o.healthcon	1.000	1.000
	(0.000)	(0.000)
1b.access#3o.healthcon	1.000	1.000
	(0.000)	(0.000)
1b.access#4o.healthcon	1.000	1.000
	(0.000)	(0.000)
2o.access#1b.healthcon	1.000	1.000
	(0.000)	(0.000)
2.access#2.healthcon	1.265	1.276
	(1.263)	(0.391)
2.access#3.healthcon	1.946	1.646
	(1.995)	(0.534)
2.access#4.healthcon	0.398	2.279
	(0.615)	(1.233)
3o.access#1b.healthcon	1.000	1.000
	(0.000)	(0.000)

3.access#2.healthcon	0.190	0.725
	(0.289)	(0.307)
3.access#3.healthcon		1.311
		(0.558)
3.access#4.healthcon		4.167**
		(2.961)
4o.access#1b.healthcon		1.000
		(0.000)
4o.access#2o.healthcon		1.000
		(0.000)
4o.access#3o.healthcon		1.000
		(0.000)
4o.access#4o.healthcon		1.000
		(0.000)
1b.access#0b.chronic	1.000	1.000
	(0.000)	(0.000)
1b.access#1o.chronic	1.000	1.000
	(0.000)	(0.000)
2o.access#0b.chronic	1.000	1.000
	(0.000)	(0.000)
2.access#1.chronic	0.760	1.060
	(0.355)	(0.221)
3o.access#0b.chronic	1.000	1.000
	(0.000)	(0.000)
3.access#1.chronic	0.055*	1.056
	(0.091)	(0.319)
4o.access#0b.chronic		1.000
		(0.000)
4.access#1.chronic		0.569
		(0.789)
3o.access#3o.healthcon	1.000	
	(0.000)	
3o.access#4o.healthcon	1.000	
	(0.000)	
Constant	0.005***	0.048***
	(0.005)	(0.015)
Observations	1,374	7,086

Standard error in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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Table B3. Estimation results with province dummies

	(1)	(2)
	m01	m02
VARIABLES	claim	claim
Access of puskesmas = 2, Easy	1.033	0.752***
	(0.250)	(0.081)
Access of puskesmas = 3, Difficult	1.297	0.724**
	(0.839)	(0.118)
Access of puskesmas = 4, Very Difficult		0.603
		(0.381)
Sex = 1, Female	1.357	1.996***
	(0.270)	(0.177)
Age	1.021**	0.999
	(0.009)	(0.002)
Education	1.098*	1.003
	(0.059)	(0.016)
Per capita expenditure	1.000	1.000
	(0.000)	(0.000)
Household size	1.055	1.028**
	(0.035)	(0.013)
Self-reported health status = 2, Somewhat healthy	1.249	0.930
	(0.611)	(0.116)
Self-reported health status = 3, Somewhat unhealthy	2.880**	1.843***
	(1.443)	(0.242)
Self-reported health status = 4, Very unhealthy	6.094**	3.161***
	(4.506)	(0.721)
Chronic condition= 1	1.796***	2.721***
	(0.361)	(0.238)
Nama Provinsi = 2, Banten	2.215	0.585*
	(2.120)	(0.179)
Nama Provinsi = 3, DI Yogyakarta	2.639	1.695*
	(2.108)	(0.458)
Nama Provinsi = 4, DKI Jakarta	3.176	0.971
	(4.253)	(0.237)
Nama Provinsi = 6, Jawa Barat	1.829	0.661**
	(1.443)	(0.128)
Nama Provinsi = 7, Jawa Tengah	2.246	1.066
	(1.818)	(0.195)
Nama Provinsi = 8, Jawa Timur	3.087	0.590**
	(2.622)	(0.123)
Nama Provinsi = 9, Kalimantan Selatan		1.386
		(0.365)
Nama Provinsi = 12, Kep. Bangka Belitung		0.548
		(0.594)
Nama Provinsi = 14, Lampung	2.326	0.442***

	(1.950)	(0.132)
Nama Provinsi = 15, Nusa Tenggara Barat	2.132	1.072
	(1.831)	(0.209)
Nama Provinsi = 16, Riau	0.770	0.352
	(0.694)	(0.367)
Nama Provinsi = 17, Sulawesi Barat	0.856	1.920
	(0.839)	(1.183)
Nama Provinsi = 18, Sulawesi Selatan		1.988***
		(0.396)
Nama Provinsi = 19, Sumatera Barat		0.792
		(0.203)
Nama Provinsi = 20, Sumatera Selatan		0.455**
		(0.146)
Nama Provinsi = 21, Sumatera Utara		0.738
		(0.178)
Nama Provinsi = 5, Jambi	0.872	
	(0.712)	
Nama Provinsi = 10, Kalimantan Tengah	0.646	
	(0.825)	
Nama Provinsi = 11, Kalimantan Timur	1.378	
	(1.132)	
Constant	0.003***	0.048***
	(0.004)	(0.015)
Observations	1,365	7,088

Standard error in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B4. Estimation results with road infrastructure

	(1)	(2)
	m01	m02
VARIABLES	claim	claim
Road = 2, Stone/gravel road	0.429**	0.735*
	(0.035)	(0.060)
	0.173	0.120
Road = 3, Dirt road	-	0.468
		(0.149)
	-	0.246
Sex = 1, Female	1.321	2.004***
	(0.155)	(0.000)
	0.259	0.176
Age	1.022***	1.000
	(0.010)	(0.835)
	0.008	0.002
Education	1.110**	1.010

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	(0.039)	(0.517)
	0.056	0.015
Per capita expenditure	1.000	1.000
	(0.292)	(0.598)
	0.000	0.000
Household size	1.045	1.033***
	(0.163)	(0.007)
	0.033	0.012
Self-reported health status = 2, Somewhat healthy	1.244	0.972
	(0.650)	(0.819)
	0.598	0.120
Self-reported health status = 3, Somewhat unhealthy	2.767**	1.928***
	(0.039)	(0.000)
	1.364	0.248
Self-reported health status = 4, Very unhealthy	4.908**	3.339***
	(0.027)	(0.000)
	3.539	0.748
Chronic condition = 1	1.746***	2.604***
	(0.005)	(0.000)
	0.342	0.220
Constant	0.006***	0.031***
	(0.000)	(0.000)
	0.005	0.007
Observations	1,364	7,104

P value in parentheses
*** p<0.01, ** p<0.05, * p<0.1