ผลกระทบของการประกันสุขภาพสำหรับคนจน (ASKESKIN) ที่มีต่อการใช้บริการด้านสุขภาพในประเทศอินโดนีเซีย

นางนุ๊กเกอ วิโดวาติ กุสุโม โปรโจ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาเศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ
คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2552

IMPACT OF HEALTH INSURANCE FOR THE POOR (ASKESKIN) ON HEALTH SERVICES UTILIZATION IN INDONESIA

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science Program in Health Economics and Health Care Management
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นางนุ๊กเกอ วิโดวาติ กุสุโม โปรโจ : ผลกระทบของการประกันสุขภาพสำหรับคนจน (ASKESKIN) ที่มีต่อการใช้บริการด้านสุขภาพในประเทศอินโดนีเซีย (IMPACT OF HEALTH INSURANCE FOR THE POOR (ASKESKIN) ON HEALTH SERVICES UTILIZATION IN INDONESIA) อ. ที่ปรึกษาวิทยานิพนธ์: ผศ. ดร. พิษเณศ เจษฎาฉัตร, 110 หน้า.

การประกันสุขภาพสำหรับคนจน (ASKESKIN) เป็นโครงการประกันสุขภาพที่ให้บริการทางการแพทย์ที่มีคุณภาพแก่กลุ่มคนจนในประเทศอินโดนีเซียโดยไม่เสียค่าใช้จ่ายในสถานพยาบาลของรัฐ ภายใต้ระบบการส่งต่อที่ครอบคลุมตั้งแต่การให้บริการสาธารณสุขปฐมภูมิแก่ผู้ป่วยนอกในศูนย์สุขภาพชุมชนไปจนถึงบริการสาธารณสุขตติยภูมิในโรงพยาบาลอำเภอ โครงการนี้มีวัตถุประสงค์ที่สำคัญคือการส่งเสริมให้มีการใช้บริการสาธารณสุขที่มีคุณภาพแก่คนจนในประเทศอินโดนีเซีย วิทยานิพนธ์ฉบับนี้มีวัตถุประสงค์เพื่อที่จะศึกษาการกระจายการประกันสุขภาพสำหรับคนจน ผลของโครงการประกันสุขภาพสำหรับคนจนที่มีต่อการใช้บริการสาธารณสุขและรูปแบบการเลือกใช้บริการทางสาธารณสุข

ข้อมูลที่ใช้ในการศึกษาได้มาจากการสำรวจทางเศรษฐกิจและสังคมของประเทศอินโดนีเซีย (SUSENAS) ด้านสุขภาพและที่อยู่อาศัยในปี 2547 และ 2550 โดยกลุ่มตัวอย่างที่ใช้ในการศึกษาคือผู้ที่มีอายุระหว่าง 19–60 ปีและอยู่ในกลุ่มที่มีรายได้ต่ำที่สุดเพื่อเป็นตัวแทนของคนจน วิธีการศึกษาใช้สถิติเชิงพรรณา, สมการถดถอยแบบ Logistic และ สมการถดถอย OLS เพื่อศึกษาการกระจายและการใช้บริการสาธารณสุขของคนจนในโครงการ ASKESKIN และใช้แบบจำลอง Multinomial Logit เพื่อศึกษารูปแบบการใช้บริการทางสุขภาพภายใต้ประกันสุขภาพ ตัวแปรอื่นๆที่นำมาใช้ในวิเคราะห์ได้แก่ อายุ, เพศ, สถานภาพทางการสมรส, ความเจ็บป่วยที่ผู้ป่วยแจ้งด้วยตนเอง, จำนวนวันที่ป่วย, จำนวนปีที่ได้รับการศึกษา, ขนาดของครอบครัว, แหล่งที่อยู่, รายได้, ปีที่ได้รับการประกันสุขภาพ, อัตราส่วนบุคลากรทางการแพทย์ต่อประชากร, อัตราส่วนสถานพยาบาลต่อประชากร ระยะทาง และเวลาการเดินทางถึงสถานบริการทางสาธารณสุขที่ใกล้ที่สุด

ผลการศึกษาพบว่าโครงการ ASKESKIN ครอบคลุมประชากรส่วนมากในกลุ่มคนจน แต่ก็ยังมีกลุ่มคนที่มิใช่คนจนบางส่วนเข้าร่วมในโครงการดังกล่าว โครงการ ASKESKIN มีผลต่อการใช้บริการผู้ป่วยนอกและผู้ป่วยในในภาพรวมทั้งหมดในสถานพยาบาลของรัฐ และผู้ป่วยในในสถานพยาบาลเอกชน แต่ไม่มีผลต่อการใช้บริการผู้ป่วยนอกในสถานพยาบาลเอกชน กล่าวคือ คนจนในโครงการ ASKESKIN มีแนวโน้มที่จะเลือกใช้สถานพยาบาลของรัฐมากกว่าการแพทย์แผนโบราณหรือการดูแลรักษาตนเอง ข้อเสนอแนะเชิงนโยบายในการปรับปรุงโครงการ ASKESKIN คือ (1) ควรจะหาวิธีในการเข้าถึงกลุ่มคนจนให้มากขึ้นและลดกลุ่มคนที่มิใช่คนลง (2) เนื่องจากโครงการนี้ทำให้การใช้บริการทางสาธารณสุขเพิ่มขึ้น รัฐบาลจึงควรจะปรับปรุงระบบส่งต่อระหว่างสถานพยาบาลเพื่อลดค่าใช้จ่ายลง

สาขาวิชา เศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ ลายมือชื่อนิสิต.....

ปีการศึกษา 2552 ลายมือชื่อ อ. ที่ปรึกษาวิทยานิพนธ์หลัก.....

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KEYWORDS: IMPACT / INSURANCE FOR THE POOR / UTILIZATION / HEALTH SERVICES / INDONESIA

NUCKE WIDOWATI KUSUMO PROJO: IMPACT OF HEALTH INSURANCE FOR THE POOR (ASKESKIN) ON HEALTH SERVICES UTILIZATION IN INDONESIA. THESIS ADVISOR: ASST. PROF. PHITSANES JESSADACHATR, Ph.D., 110 pp.

Health insurance for the poor (ASKESKIN) is insurance program to protect the poor. ASKESKIN provides free services mainly in public health facilities, based on the referral system ranging from outpatient care in the community health center to tertiary health care services for inpatients in the district hospital. The main purpose of this program is to increase health utilization and quality of care among the poor in Indonesia. The aims of this study are to investigate the distribution of ASKESKIN program among the poor, its effect on the health service utilization and the pattern of health care choice.

Data in this study was obtained from Indonesia's Socio Economic Survey (SUSENAS) Health and Housing Module 2004 and 2007. However, the samples used in the study include only persons aged 19-60 years in the lowest income quintile to represent the poor. Besides the descriptive analysis for the ASKESKIN distribution, the logistic regression, and the OLS regression model are used to analyze the effect of ASKESKIN on health care utilization. The multinomial logit model is used to study the pattern of health care choice under ASKESKIN scheme. In addition to ASKESKIN enrollment variable, this study also includes other variables that determine health service utilization among the poor i.e. age, sex, marital status, self reported illness, day with illness, years of schooling, family size, location, income, year of insurance, health worker ratio, health facility ratio, distance and time to the nearest health facilities.

The results of the study show that distribution of ASKESKIN program has mostly benefited the poor although there is some leakage to the non poor. ASKESKIN has affected overall outpatient utilization, overall inpatient utilization, public outpatient, public inpatient, and private inpatient utilization. Nevertheless, the ASKESKIN program seems to be insignificantl y to private outpatient utilization. ASKESKIN program has the positive effect on the pattern of health care choice. It means that people under ASKESKIN program are more likely to choose public health facility rather than traditional healers or self treatment. Policy recommendations for improving the ASKESKIN program are as follows: (1) improving the distribution of ASKESKIN enrollees to avoid the leakage of the program to the non poor; and (2) for the increase in health care utilization, the government should improve the health care referral system to reduce the cost.

Field of Study : Health Economics and Health Care Management Student's Signature .....

Academic Year : 2009 ..... Advisor's Signature P. Jessadachatr.

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LIST OF ABBREVIATIONS

DALY	Disability-adjusted Life Years
IDR	Indonesian money currency (Indonesian Rupiahs)
IPD	Inpatient care
MMR	Maternal Mortality Rate
MoH-RI	Ministry of Health (Republic of Indonesia)
MNL	Multinomial Logit Model
NHA	National Health Account (Republic of Indonesia)
OLS	Ordinary Least Square
OPD	Outpatient care
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Problems and Its Significance

Equal access for health care has become main agenda in many countries. They believe that adequate medical care is a fundamental human right. Equality in accessing health care is also proved as good tool in poverty reducing strategy. In many cases, where the main part of health care payments are out of pocket and health insurance market are underdeveloped, people are more vulnerable to fall into poverty. In that situation, the poor group will be the one who left behind. Interventions from government or even non government institutions are needed to protect this indigent group. One of the mechanisms targeting the poor in order to get equality access is by subsidizing the health insurance for the poor. The common justification to do so is the health services are very costly for the poor, their income usually can not afford the health care need or even the basic needs. And it is also believed that there is positive externalism from healthy population.

Government of Indonesia gives more concern on the poor group because it states on the Indonesian constitution that government has to take care of orphan and indigent people. In 2004, 16.7 % from total population or about 36 million people is categorized as poor people. Health utilization rate in Indonesia is still low with under developed health insurance. Health insurance coverage is only about 40.0% from total population in the mid of 2005 (World Bank, 2008). Indonesia is one of the countries in the Asian region where health utilization rate has decreased because of economic crisis in 1997. But while other countries could reveal the health utilization to the pre level crisis, overall health utilization in Indonesia failed to recover to the level before crisis. The self treatment has continued to grow. People still relied on self treatment, which is an effort by members of the household to do treatment without coming to health facility, call for a doctor or other health workers for example take modern medicine, herbs, or massage in order to alleviate the illness. Based on national statistics office of Republic of Indonesia (BPS-Statistics Indonesia) data in 2006, among the population that reported morbidity about 51.0 % relied on self treatment,

15.0 % did not do any treatment, and only 34.0 % go to the health facilities. Compare to the data before crisis in 1993, about 53.0 % of people visited health facilities, 20.0 % did not seek any treatment, and only 27.0 % from population relied on self treatment. The data also showed that the poor still rely significantly on private provider for outpatient care services and in term of inpatient care service, the poor used hospital services less than the rich.

The current health insurance system in Indonesia consists of variety public and private insurance. There are many schemes of insurance: health insurance for formal sector employee (JAMSOSTEK), civil servants (ASKES), military health services (ASABRI), community based health insurance in some areas, and voluntary insurance usually run by private insurances company. The fragmented system made higher administrative costs, major equity, risk selection problems, and also limits pool size. This also made exclusion for non formal employees and poor people to have financial protection. Largely as a result of Law number 40/2004 about National Social Health Insurance, Government of Indonesia trough Ministry of Health then provide particular scheme for poor people to ensure this group on accessing health care facilities. Health insurance for the poor (ASKESKIN) program was initiated at 2005. ASKESKIN is one of the strategic improvements to follow up the previous health financing assistance for the poor. Government of Indonesia has done many efforts to show that government is pro poor before come to ASKESKIN program. Such as Dana Sehat program, which is community based health insurance. This program is managed by community with some level of contribution, but it has limited beneficiaries: program covered only for primary care and did not cover the hospitalization. This caused Dana Sehat program can not attract membership. There is also particular scheme for pregnant woman, called TABULIN program. The aims of this program are to cover maternity care including birth delivery. Other community based health insurance also developed in the district area. Some are successful such as in Jembrana district of Bali province. But the main issue for community based health insurance is its capacity to get large membership in order to reduce cost. Health card program was launched in 1994, this is government's assistance in the form of cost relief for poor to get primary and inpatient services in public providers. The poor household can get free outpatient in Community Health Centre and third class inpatient service in district

hospital by asking letter of poor (SKTM) from sub-district head and village head. Other programs also launched but not directly related with health services such as, BLT program or direct cash assistance. In this program, the poor family will get cash money each month as the compensation of increasing fuel price. All these programs were varies in ways but the purpose is the same i.e. protecting the poor.

ASKESKIN is one of the government's major efforts to improve health conditions by promoting equality in primary health care. The government introduced ASKESKIN in order to expand health insurance coverage for entire population. The main goal of ASKESKIN program is to increase access and quality of health services among the poor people. At first, ASKESKIN only targeted the poor people and number of beneficiaries was estimated based on poverty survey held by BPS-Statistics Indonesia. One can be entitled to receive ASKESKIN if individual meets the criteria of: floor area of residential buildings; types of residential buildings floor widest; types of walls largest residential buildings; facility where defecation; drinking water sources; the main light source; type of fuel for daily cooking; consumption of meat, poultry, milk in a week, eat in a day for each; household member; buying new clothes for each member (some members) of the household in a year; ability to pay for treatment to a health clinic or polyclinic; the main employment of household heads; education level of household head; ownership of assets or savings. Later the beneficiaries are extended to include the almost poor people. When ASKESKIN launched in January 1, 2005, the targeted population is about 36 million people and government prepared the budget at about 2.1 trillion Rupiahs. But the regional governments projected larger numbers of poor up to 60 million people (World Bank, 2008). Then in 2006, number of beneficiaries of ASKESKIN is 66 million people and government prepared budget of 3.6 trillion Rupiahs. Government increased the number of beneficiaries up to 74.6 million people in 2007 and was estimated to spend budget about 4 trillion Rupiahs. The governments of course should give more attention on this because it means more budgets are needed. Summarize from National Health Account of Indonesia, total expenditure in health as percentage of GDP in 2005 is 2.1%, which is still low from the WHO recommendation (5%). This number does not change much in 2007, it became 2.5%. Government also increased the role in health care field, by increasing general government expenditure on health

as percentage of total health expenditure from 39.8 % in 2004 to 51.3 % in 2007. The increasing number related to the launching of ASKESKIN program in 2005.

ASKESKIN covers all service of primary care for outpatient in Community Health Centre (including contraception kits, child and maternal care, dental treatments) and third class inpatient service (including ambulatory service and emergency cases) in district hospital by referral system. The medicine prescribes for ASKESKIN beneficiaries are generic drugs, drawn from essential drug list and if necessary drugs are not in the list, the health facilities must make an effort for another appropriate drugs. Procedures that uncover in ASKESKIN scheme are general check up, cosmetic procedures, teeth prostheses and fertility treatment.

The funding source for ASKESKIN program comes from government budget each year. At first, cost management of ASKESKIN program is mandated to state-owned insurance company, called PT ASKES, by implementing cost and quality control. Since 2008, the name of ASKESKIN was changed into JAMKESMAS which has different management with previous ASKESKIN. In JAMKESMAS, the government directly managed the program through Ministry of Health and used PT ASKES only for card distribution. Premium for each ASKESKIN beneficiary is 5,000 Rupiahs per month (about 0.5 US $). This premium was paid by the government to the PT ASKES as fund manager, then PT ASKES will distribute to community health centers by capitation system and for public hospitals by reimbursement of claim system.

The members of ASKESKIN are poor people who already registered and have a membership card. The beneficiaries are free from contribution. Ministry of Health launched the beneficiaries list then district head set the name of beneficiaries through a decree. The membership card is published and distributed by PT ASKES. While people were waiting for the card distribution, one of ASKESKIN policies in the early stage after launching said that poor people can use health card or SKTM letter in order to get health services. This situation triggered leaking coverage of ASKESKIN because some people misused the ASKESKIN benefit. From the demand side, the estimate number of ASKESKIN beneficiaries are predicted to be increasing because people can easily join the program not only using ASKESKIN card but also using the previous health card and letter of poor (SKTM) issued by village leader. SKTM is a

recommendation letter from the village head which is explaining that individual is poor people.

The increasing number of ASKESKIN beneficiaries showed the government's commitment to provide health financing protection for those who could not afford it. Along with increasing number of beneficiaries, government has to add the budget. Government do not state clearly about how long this program will be implemented. But Government of Indonesia has state his commitment on this program by prioritizing ASKESKIN in the 100-day program of the Indonesian's new elected president 2009-2014. There are some issues of ASKESKIN in budgetary meeting for 2010 budget year, whether to increase budget for ASKESKIN or not. This is of course related with limitation of government's resources where others problems need to be considered. Government also considers expanding health insurance coverage using ASKESKIN scheme not only for poor and almost poor people but also to entire population in order to achieve universal coverage. Policy makers are still need to be convinced about the targeted of ASKESKIN program. Some people might misuse the program, by using SKTM letter to take advantage from ASKESKIN program even though those people do not include in the category of ASKESKIN beneficiaries. To get SKTM letter is not difficult, because people just come to the village office, applying this letter and pay some contribution. After the implementation of ASKESKIN program, government expects that poor people will optimally utilize the public health facilities rather than private facilities, starting from community health centre and to higher facilities (public hospital), because the network of ASKESKIN program mainly consists of public health care providers. The increasing number of utilization must be carefully examines as whether this increase related to the use from poor people or from other groups, or whether this increase related to the health insurance availability as one of success indicator of ASKESKIN program.

It is important to have knowledge about achievement of the program in order to make right strategies. The existing assessment of the program only based on provider information, such as recorded number of patient with ASKESKIN received by public health care facilities, or ASKESKIN card distribution. This study will evaluate ASKESKIN program at microeconomics level. Accurate evaluation of the program is necessary, particularly in Indonesian case where it faces constrained

resources and to ensure that the budget allocation for this program is not wasteful. We expect that the result of the study will provide useful feedback to policymakers and propose proper directions for the upcoming policy.

1.2 General Information of Indonesia

1.2.1 Country Profile

Table 1.1 Basic population indicators of Indonesia, 1971-2005

	1971	1980	1990	1995	2000	2005
Total Population(million)	119.2	147.5	179.4	194.8	205.1	218.9
Sex ratio (male/100 female)	97	99	100	99	100	101
Dependency ratio	86	79	67	61	54.7	50.1
Population under 5 years (%)	16.1	14.4	11.7	11.1	10	
Population under 15 years (%)	43.97	40.9	36.6	33.54	30.7	28.5
Population 15-65 years (%)	51.5	53.6	59.6	62.3	64.6	64.6
Population over 65 years (%)	2.51	3.25	3.88	4.25	4.7	4.9
Population in urban areas (%)	17.3	22.3	30.9	34.3	42	48.1
Annual rate of growth (5)	2.3	1.97		1.49		1.3
Life expectancy (years)	47.7	55.3	61.12	60.5	64.5	68
Infant mortality rate (per 1,000 live births)	145	109	63	55		46

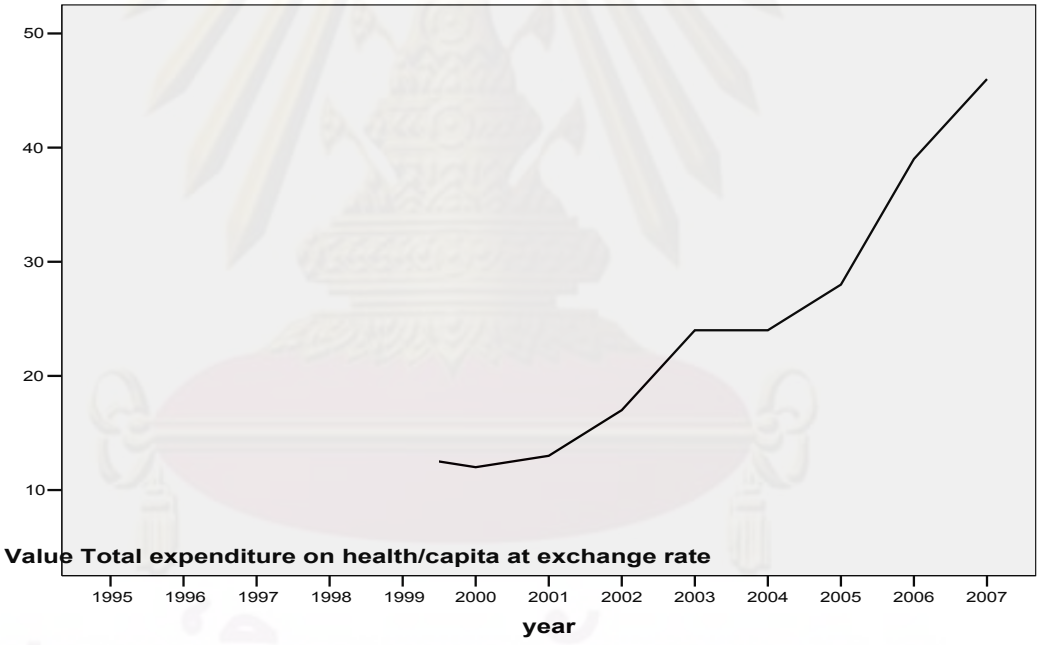
Source: BPS-Statistics Indonesia

Indonesia is the largest archipelago in the world to form a single state, it is located in south east Asia and totaling about 17,508 island and islet. Indonesian people consists of various ethnics groups which come up with diversity in district language, art, tradition, and culture. According to the 2000 Population Census, Indonesia had total population of 205,843,000 heads placing it as the world's fourth most populated country. Population growth rate tended to decline during the past two decades, based on Inter-Census Population Survey (SUPAS), in 2005 Indonesia had total population of 218,868,791 (annual rate of growth: 1.3%), 48 percent of the total population lived in urban areas almost the same compared to population who lived in rural areas (see Table 1). The administrative units are divided into 33 provinces, 370 districts, 96 municipalities, 6131 sub districts and around 73,405 villages.

1.2.2 Health Status of the Population

For the last three decades, health status of Indonesian population has significantly improved. Table 1.1 provides some of the population indicators of Indonesia. The infant mortality rate has declined, comparing 145 deaths in 1971 and 46 in 2005. Life expectancy for both male and female also increased up to 68 in 2005. Considering population structure where the older population is increasing from 2.52% in 1971 and 4.90 in 2005, and add up with the decreasing in fertility rate from 4.68 (1976-1979) to 2.26 (2000-2005), it showed that Indonesian population shift towards the ageing society

Figure 1.1 Total expenditure on health/capita at exchange rate



Source: NHA, http://www.who.int/nha/country/idn/en/

Many factors influenced this achievement, one thing that is still a debate is an increasing of health resources. In Figure 1.1, it shows the total expenditure on health per capita. During the economic crisis in 1998, the total expenditure is decline. But after the crisis year, it moves up. Compare to MMR's achievement in Indonesia, it is decreased from 390 in 1994 to 307 per every 100,000 live births (Indonesia Demographic and Health Survey). This is amongst the highest in the South-East Asia

region. The lifetime risk of a mother dying of causes related to childbirth is estimated to be 1 in 65 compared with 1 in 1,100 in Thailand (WHO 2002).

The disease pattern in Indonesia also shifted from communicable diseases to non-communicable diseases. The change in population's life style made this shift and pushed government to make different policy toward it. Table 1.2 provides the major burden of disease of Indonesia. As shown in the table, the infectious diseases such as Tuberculosis still hold big part in causes of death among Indonesian people, but other diseases are non infectious and mostly coming from life style. Many people follow unhealthy life style and ignoring sufficient nutrient and exercises. One disease comes from risk factors that difficult to control such as road traffic accidents.

Table 1.2 Top 10 causes of death, all ages, 2002

Causes	%	Years of Life Lost
Ischemic heart disease	14	8
Tuberculosis	8	10
Cerebrovascular disease	8	4
Lower respiratory infections	7	5
Perinatal conditions	5	10
Chronic obstructive pulmonary disease	5	2
Road traffic accidents	3	5
Diabetes mellitus	3	2
Hypertensive heart diseases	2	1
Diarrhea diseases	2	4

Source: Death and DALY estimates by causes 2002, http://www/who/int/entity/healthinfo/statistics

1.2.3 Healthcare System

Both public and private sectors contributed in providing health care in Indonesia. Ministry of Health has duties to assist president in performing government's affairs in the field of health. Ministry of health will provide, manage and control health affairs in the country. Most of hospitals are under Ministry of health, other hospitals are held by other ministries or institutions such as ministry of

defense, state-owned company and private sectors. Numbers of health facilities are summarized in Table 1.3.

Table 1.3 Health care facilities in Indonesia, 2004 and 2008

Facilities	2004	2008
Specialized hospital	270	292
General Hospital	976	1,080
Public hospital	542	613
Private hospital	434	467
Community health centre (PUSKESMAS)	7,550	8,548
PUSKESMAS care	2,010	2,438
PUSKESMAS non-care	5,540	6,110
Number of beds	132,231	149,538
Number of beds general hospital	112,640	128,750
Number of beds specialized hospital	19,591	20,788
Integrated health post (POSYANDU)		70,046
Village clinic (POLINDES)		25,271
Village health post (POSKESDES)		11,287
Pharmacies	8,557	10,931
Drug store	7,716	7,940
Wholesale pharmacy	2,445	10,931
Medical equipment dealers	259	667
Sub-distributor of health equipment	819	3,296

Source: Indonesian Health Profile, Ministry of Health, 2008

The ratio of Community Health Centre (PUSKESMAS) as the lowest level of public health care provides are increasing from 3.48 facilities in 2004 to 3.74 facilities per 100,000 populations in 2008. Government also increased the number of PUSKESMAS care which has inpatient service compare to PUSKESMAS non-care that provides outpatient services only. The number of hospitals is increasing about 10.11% from 2004 to 2008. This addition comes more from public hospitals. Ratio of hospital beds per 100,000 populations also increases from 60.92 in 2004 to 65.44 in 2008. The physician to population ratio in 2008 is 19.59 per 100,000 populations. This number has wide range for each province from 10.36 to 53.89, it has been known that because of geographical barriers or remote areas, the physician distribution become uneven. Some areas has very high ratio whereas other areas has very small amount of physicians.

1.2.4 Healthcare Financing

In 2005, only 41.88 % from total population has health insurance. The number of population with insurance was increased as long as government program to cover poor people under health card program and continue with ASKESKIN scheme. The fragmented health insurance system in Indonesia made most of the population was not covered by any forms of health insurances. Table 1.4 presents information of each health insurance scheme.

Table 1.4 Population with health insurance, 2005

Health Insurance	%
Health insurance for government employee and pension (ASKES)	6.74
Social security (JAMSOSTEK)	2.08
Dana Sehat	1.92
JPKM	0.95
Health Card, ASKESKIN	27.68
Others	2.51

Source: Central Financing and Health Insurance, MoH-RI

1.3 Research Questions

1.3.1 Primary Research Question

How does Health Insurance for the Poor (ASKESKIN) affect poor people on their health service utilization?

1.3.2 Secondary Research Questions

- Has the implementation of Health Insurance for the Poor (ASKESKIN) already targeted the poor?
- Does Health Insurance for the Poor (ASKESKIN) affect public health service utilization in term of outpatient care and inpatient care?
- Does Health Insurance for the Poor (ASKESKIN) affect private health service utilization in terms of outpatient care and inpatient care?

- Is there a change in the pattern of health care choice after implementation of Health Insurance for the Poor (ASKESKIN) in Indonesia?

1.4. Objectives of Study

1.4.1 Overall Objective

To investigate the consequences of Health Insurance for the Poor (ASKESKIN) on health service utilization of the poor in Indonesia.

1.4.2 Specific Objectives

- To analyze the distribution of Health Insurance for the Poor (ASKESKIN) in Indonesia.
- To evaluate the impact of Health Insurance for the Poor (ASKESKIN) on health care utilization of outpatient care and inpatient care at the public health care facilities among the poor.
- To evaluate the impact of Health Insurance for the Poor (ASKESKIN) on health care utilization of outpatient care and inpatient care at the private health care facilities among the poor.
- To analyze the pattern of health care choice after implementation of Health Insurance for the Poor (ASKESKIN) in Indonesia.

1.5 Scope of Study

In this study, we will use individual as unit of analysis, because ASKESKIN beneficiary is for each individual that categorized as poor people. We will analyze the consequences of Health Insurance for the Poor (ASKESKIN) program on health care utilization, which is including outpatient care and inpatient care in both public and private health facilities. These consequences will be measured at the national level, based on 2004 and 2007 Indonesia's National Socio Economics Survey (SUSENAS) data which can represent the whole country.

1.6 Expected Benefits

Potential beneficiaries of this study may include: government of Indonesia through Ministry of Health as the provider of ASKESKIN also scholars involved in health economics research. The findings from this study are expected to inform the policy makers and decision makers related in pro poor health policies in the following manners:

- To provide evidence whether ASKESKIN program can target the poor.
- To provide information about the impact of ASKESKIN program on the health utilization.
- To provide information for resource planning on health care utilization at macro levels.

CHAPTER II

LITERATURE REVIEW

2.1 Implication of Subsidized Health Insurance

It has been showed in theory and also based on evidences that there is positive linkage between good health, nutrition, the well being of individuals and the overall economic development (Schultz, 2005). When a country wants to have great achievement in economic development, the need of efficient and equitable health care system as useful tool to break the circle of poverty and ill health is indispensable (Jutting, 2005). Public interventions to support the poor are one of the social risk management approaches in order to improve the capacity of the poor in dealing with risks. This approach is based on assumption that: the poor have different risks; this group is more vulnerable compare to the other group in society; and also the management can be improved by public action (Holzmann & Joergensen, 2000). The availability of health insurance in low income countries is used as important tools to finance health care provider (WHO, 2000). Compare to other scheme such as user fee, health insurance is more promising alternatives. Griffin (1992) explained about how health insurance works, as it will pool unforeseeable risks and transferred to fixed premium.

The availability of health insurance for every citizen in the country has become important issue. When individual has health insurance, they can prevent from health shock that usually lead into poverty. Ideally all of the citizens have health insurance to ensure the access to health services. In developing countries, where they are still struggling with others problem, the coverage of health insurance in the population is still low. Limitation in health insurance may lead to the high rate of out-pocket payment for health cares. All East Asian countries system except Thailand are indicating high level of out-pocket spending, some of these countries are: Laos, Vietnam, Cambodia, Malaysia, China, Philippines and Indonesia (World Bank, 2008). Poor group and informal worker are still common groups who excluded from the insurance coverage scheme.

In order to reach uninsured groups, many developing countries have been used tax revenues to provide subsidized health insurance for the poor (Trujillo, Portillo, & Vernon, 2005). The targeted population is informal worker or the poorest segment of population. Different country implements different ways to determine the beneficiaries such as in Thailand, who enroll all the uninsured people to universal coverage scheme (Wagstaff, Lindelow, Jun, Lin, & Juncheng, 2009), Mexico also expand health coverage for the poor by providing social protection in health which the main purpose is to reduce the catastrophic health expenditures (King et al. , 2009). In the case that only particular groups (poor people) involved with subsidized insurance scheme from the government, the important issue here is the targeting the real beneficiaries. Adequate information system is needed to avoid leakage or local capture of benefits by the non poor (Sparrow, 2008). Information usually gathered by survey or census before program implementation. Various criteria are implemented to determine the beneficiaries. In Indonesia's health card scheme as part of Indonesian Social Safety Net[1], they used prosperity measurement, consisted of five basic needs criteria: worship, eat, clothing, housing, and access to modern medical care. In Columbia's SUBS program, they used crude welfare index, consisted of household characteristics, human capital endowment, and reported income level. The expansion of health insurance may also lead to the increasing of health spending. In circumstances where the country still has low percentage of health spending, the increasing rate can be seen as government commitment to improve citizen's quality of life.

One alternative model for describing individual's decision regarding health care utilization was introduced by Grossman (1972). This approach sees the demand for health care as investment in health capital, people consume health because it will improve their stock of health in order to increase human resource productivity. Health care is one of input together with other health inputs such as nutrition and personal exercise. The extension of Grossman model was done by Cropper (1977), by taking account of illness that may affect the individual's

[1] Indonesian Social Safety Net (*Jaring Pengaman Sosial or JPS*) launched at 1998 as government program to secure health care utilization for the poor during economic crisis that hit Indonesia as well as Asian countries in the mid 1997.

productivity and analyze the demand of health care in term of preventive and curative care and assume that there will be different demand over the life cycle.

Another view sees demand for health care in a principal-agent framework (Zweifel and Manning, 2000). In this view, the individual's decision to seek care is not only determined by him/her but it is also influenced by health care provider's decision. Individual will decide when and where to seek care and health care providers will determine by how much the health care needed conditional after individual first decision has been made.

Behavioral changes from health insurance as an advance study of health consumption usually come to the moral hazard framework. Moral hazard refers to the additional quantity of health care demanded by someone who has health insurance (Folland, Goodman, & Stano, 2001). Another term used is hidden action. Arrow (1985) described hidden action in low income countries settings where the increasing of health consumption under insurance scheme is not necessarily matter and the fulfillment of health needs is more important. Moral hazard is usually said to be the caused of increased health care utilization, but it was not always like that. Nyman (1999) has argued that insurance purchase is often motivated by a desire to access necessary, but otherwise unaffordable, treatment. Some studies in developed country have already revealed the connection between demand incentives in the form of health insurance and health care choices but only few studies have been conducted in developing countries (Johar, 2008). The study in US using RAND health insurance experiment showed that as the levels of out-of-pocket expenditures declined, the consumption of health services is increasing (Manning, Newhouse, Duan, Keller, Leibowitz, & Marquis, 1987). Study in Australia found that the more extensive insurance coverage induced increasing in the utilization of health services by 22.0%, whereas other studies in different countries also gave similar result: Republic of Ireland, Switzerland and France (Jowett, Deolalikar, &Martinsson, 2004). Different settings from developed countries may imply different results in developing countries because there are other factors that can counteract the impact of insurance such as transportation cost and the availability of providers. In most developing countries like some in African countries where transportation cost is still very high, lack of providers, and the high existence of traditional medication will make connection

between demand incentives and health consumption are not clear enough (Castro-Leal, 2000). Study in China and Niger found that pre-paid insurance plans give positive impact on health service use (Phelps, 1992; Diop, Yazbeck, & Bitran, 1995).

Wagstaff (2009) suggested that there was parallel interest investigate the impacts of health insurance program: in terms of their effect on utilization, out-of-pocket spending and health outcomes. Because of simplicity and time constrained, most studies investigated on utilization or out-of-pocket spending rather than health outcomes. It is found from the theory and empirical evidences that insurance status is expected to improve access to care and to reduce payment for services (Ekman, 2007).

2.2 Previous Studies on Measuring Impact of Health Insurance

One method to measure the impact of health insurance is by calculating the likelihood of visiting health care facilities. The following describes the different specification and underlying assumptions of each method with references to some examples from past literatures. The summary of previous studies is as follows (see Table 2.1).

2.2.1 Multinomial Logit Model

The impact of insurance program on utilization can be measured by using likelihood of visiting health facilities (Waters, 2000; Yip & Berman, 2001). To investigate the effect of mandatory health insurance[2], in Indonesian scheme, Hidayat, Thabrany, Dong, and Sauerborn (2004) using multinomial logit model. They measured the probability that an individual uses outpatient care and considered choices among self-treatment care from public providers and from private providers. Their study found that mandatory health insurance has positive impact on public health utilization. The advantage of using multinomial logit is we can distinguish the choice for more than two choices in the same equation and represent the real choice. A major requirement of using multinomial logit is the model requires independency

[2] Mandatory insurance scheme for civil servants (ASKES) and man datory insurance scheme for private employees (JAMSOSTEK)

among different alternatives or must be satisfied with “independence of irrelevant alternatives (IIA)” (Greene, 2000). The following lists are explanatory variables used in past studies with multinomial logit model (Hidayat et all, 2004):

- income
- health insurance status
- health status
- socioeconomics: sex, age, education, marital status
- household information: household size, electricity, rural/urban, region
- cost and time to health facilities

In order to capture the need for health care, they used three measurements to determine health status based on individual’s responses of self reported illness with a recall period of four weeks: morbidity, activity of daily living and self rated general health status. Most other studies related to health utilization also include health status as explanatory variable. This study focused on health utilization conditional upon need as suggested by Makinen et al. (2000) that this is practical indicator of equity access in health system and can be done using household survey.

Problem that usually arises is health insurance variable is endogenity which is the factors affect health insurance choice might be the same with factors affect health care utilization (Vera-Hernandez, 1999). Some procedures might be applied to tackle the problem of endogenity. Waters (1999) suggested to estimate reduced form of insurance participation using probit model using all covariates in health care utilization equation , then the predicted and observed values of the insurance variables were then included in the health care utilization.

A study about effect of health insurance on pattern of treatment seeking behavior is done by Jowett, Deolalikar, & Martinsson (2004) in the case of three provinces in Vietnam. They found that insurance patient will use more for outpatient services in public facilities. In this study they also used multinomial logit model to estimate consumer choice of insurance plan and health service provider. Different from Hidayat where health insurance is mandatory health insurance, health insurance in Vietnamese’s case is voluntary health insurance. The decision to enroll on voluntary health insurance is called selection bias that can result endogeneity and biased coefficient. To solve this problem, they used two-stage instrumental-variable

multinomial logit model. The study also adds log consumption expenditure as proxy of income as explanatory variable in order to capture different pattern of health seeking behavior across income level. Most explanatory variables are dichotomous variable. The following are variables used in their study:

- log consumption expenditure per capita
- voluntary health insurance coverage
- long-term disability or illness
- socioeconomics: sex, age, schooling years, employment
- household information: rural/urban, region

2.2.2 Hurdle Model

It is widely known that demand for health care can be defined as two different decision processes (Pohlmeier & Ulrich, 1995). The first decision is made by individual whether he/she wants to use health care and the second decision was made not only by individual but also influenced by health care providers. This model is believed to be good starting point when analyzing health care utilization. The hurdle model for count data was first proposed by Mullahy (1986). It is shown the two different process for individual decision and positive count after individual decide to use health care as P1(.) and P2(.). The log likelihood is given by:

$$LogL = \sum_{y-0} \log\left[1 - P_1(y > 0 \mid x)\right] + \sum_{y>0} \left\{\log\left[P_1(y > 0 \mid x)\right] + \log\left[P_2(y \mid x, y > 0)\right]\right\}$$

$$= \left\{\sum_{y=0} \log\left[1 - P_1(y > 0 \mid x)\right] + \sum_{y>0} \log\left[P_1(y > 0 \mid x)\right]\right\} + \left\{\sum_{y=0} \log\left[P_2(y \mid x, y > 0)\right]\right\}$$

$$= LogL_1 + LogL_2$$

Each part of two part hurdle model can be analyzed separately. The first part which is participation decision usually estimate by logit, probit or negative binomial. The second part which gives the amount of health care use, the common model is poisson or negative binomial.

Ekman (2007), adopted the approach called “two-part model” as developed by Rand Health Insurance Experimental (Duan, Manning & Morris, 1982) to asses the effect of health insurance on utilization and expenditure. To measure

impact in health utilization, Ekman used two part hurdle model. His study not only focused on one health insurance scheme but all health insurance schemes in Jordanian. Basic model for this approach is developed from logit model, by estimating the probability of health care visit conditional on being ill and estimated intensity of health care visit using count data model, in this case is negative binomial model (Jones, 2000). The logit model can be written as follows:

$$\Pr ob(utilization > 0 \mid ill) = \beta X + \varepsilon$$

Where X is a set of covariates which includes health insurance status. The negative binomial is as follows:

$$\Pr(y \mid x) = \frac{\Gamma\left(y + \alpha^{-1}\right)}{y!\Gamma\left(\alpha^{-1}\right)}\left(\frac{\alpha^{-1}}{\alpha^{-1} + \mu}\right)\left(\frac{\mu}{\alpha^{-1} + \mu}\right)^{y}$$

Where y is a health care visit that greater than zero or positive count which range from one to six visits.

There is empirical analysis when health care use is treated as dependent variable, it is known as count variable or "non-negative integer values count y = 0, 1…" (Jones, Rice, Bago d'Uva, & Balia, 2007). Many previous studies take health care use in various measurements: visits to doctor (Hakkinen, Rosenqvist & Aro, 1996), physician visits and weeks of hospitalization (Gerdtham, 1997), number of outpatient visits (Deb & Trivedi, 2002). The common model for count data is poisson model. But poisson model has some disadvantages related to unobserved heterogeneity that usually exist such as supply side effect that rarely captured from household survey data. If we do not consider about unobserved heterogeneity, it will leads to over dispersion and excess of zeros (Cameron & Trivedi, 1998). Pohlmeier & Ulrich (1995) then proposed negative binomial model for both parts. They argued that negative binomial can address equality of the two parts decision making.

Ekman's study also used the same variables with previous studies such as: income, socio demographic (age, education, sex, marital status, employment), health insurance enrollment, and health status. For health insurance enrollment, this study investigates general health insurance enrollment and specific health insurance scheme. He found that in general health insurance schemes in Jordan does not have positive impact on utilization and has mix analysis on reduce out-of-pocket spending.

A similar study conducted in Egypt to measure the effect of School Health Insurance Program (SHIP) on access to health care. Yip & Berman (2001) measured access on health care utilization and expenditure. SHIP is a government subsidized health insurance program that targets school children. The main objective of this program is to increase access on health care. So the study wanted to assess the SHIP achievement. This study only investigated particular health insurance in Egypt using two part model. The first part measured effect of health insurance on health care utilization using logit model. The model can be written as follows:

$$\Pr ob(visit > 0) = X\beta + \varepsilon$$

The second part was log linier model to estimate incurred level of out-of-pocket expenditure conditioning of positives use of health care. The model is:

$$\text{Log(out-of pocket exp|visit>0)} = X\gamma + \mu$$

The X in both models is a set of covariates.

In this study, Yip and Bermani did not distinguish among health care providers. They aggregated health care use because the availability of data did not allow separating between public and private providers. The aggregate use of health care utilization in the analysis might mislead the result as pointed by Van Doorslaer, Koolman, & Puffer (2002). This study also considered about the weakness of analysis from "ill" sample or only used entire sample from the sample that reported illness during two weeks of periods. That is if there is unobserved variables that affect both likelihood to report illness and to seek health care then the result of analysis will be biased. They analyzed both ill sample and the whole sample and the result is no significant difference. To gauge the result, the study included explanatory variables as follows:

- SHIP coverage
- other insurance coverage
- in school conditional without SHIP
- demand side factors: parental education, age, gender, perceived health status, seasons.
- supply side factors: rural or urban location and governorate.

The result of the study is that the SHIP was significantly increasing the probability of visit among SHIP member. A serious concern appeared after the study related to the effectiveness of health insurance program on targeting beneficiaries.

Other study in evaluating the impact of health insurance in health care use was done in Ecuador. The study emphasized the problem of selection bias before doing the impact measurement (Waters, 1999). Health insurance effect on health care use might difficult to measure because health insurance suspected to be endogenous to health care use that will lead to selection bias. The selection bias means that the people who opt to enroll on health insurance scheme have unobservable characteristics related to health status in using health care service. The study without considering the presence of endogeneity from health insurance variable will magnify the health insurance effect will lead biased interpretation (Manning et al, 1987). Study by Waters investigated two kind of health insurance: General Health Insurance (GHI) and *Seguro Campesino Social* (SSC) program. The models allow the study to test the selection bias and correct it if it is available. Basically the model developed from standard probit model.

The author mentioned the potential endogenous variables are health insurance affiliation, health status and eligibility of SSC program. The exogenous variables are as follows:

- individual: age, sex, education, severity of illness, wage level
- household: quintile of adjusted per capita consumption. Household size, main language, distance to the closest health centre, region, level of urbanization
- community: price of health care, health care characteristics.

The result showed that GHI program has positive impact on curative health care but no significant effect on preventive health care use. The SSC program has positive but insignificant to preventive and curative health care use.

Table 2.1 Summary of previous studies

Authors	Type of Insurance	Dependent Variable	Methods of Analysis	Data	Finding
Waters HR (1999)	General Health Insurance (GHI) and Seguro Campesino Social (SSC)	Preventive health care use and curative health care use	Standard probit	1995 Ecuador Living Standards Measurement Survey	GHI program has positive impact on curative health care but no significant effect on preventive health care use. SSC program has positive but insignificant to preventive and curative health care use
Yip W, Berman P. (2001)	School Health Insurance Program (SHIP)	Utilization in outpatient (number of visit) , inpatient care (number of bed days) and expenditure	Logit model for utilization Log linier model for expenditure	1995 Egyptian Household Health utilization and Expenditure	SHIP increases visit rates and reduces financial burden
Trujillo AJ, Portillo EJ, Vernin, AJ. (2003)	Subsidized health insurance (SUBS)	Utilization in outpatient care (number of visit) and inpatient care (number of bed days)	Propensity Score Matching and Instrumental Variable	1997 Columbia Living Standard Survey	SUBS greatly increased medical care utilization among the poor and uninsured

Table 2.1 (continued)

Authors	Type of Insurance	Dependent Variable	Methods of Analysis	Data	Finding
Hidayat B, Thabrany H, Dong H, Sauerborn R. (2004)	Mandatory health insurance for civil servants and private employee	Utilization in outpatient care (number of visit) in public and private facilities	Multinomial logit model	1997 Indonesian Family Life Survey	Mandatory health insurance for civil servants has positive impact on utilization in public facilities but not in private facilities. Mandatory health insurance for private employee has positive impact on utilization in both public and private facilities
Jowett M, Deolalikar A, Martinson P. (2004)	Voluntary health insurance	Choice of health care facilities	Two Stage Instrumental Variable Multinomial Logit Model	Haipong, Ninh Binh and Dong Thap provinces Household Survey	Insurance people are more likely to use outpatient facilities and public providers
Ekman B. (2007)	Various type of health insurance	Outpatient utilization (number of visit) and expenditure	Two Part Model using Logit model and Negative Binomial Model	2000 Jordanian National Household Survey	In general health insurance does not effect health care utilization

Table 2.1 (continued)

Authors	Type of Insurance	Dependent Variable	Methods of Analysis	Data	Finding
			Log linier model		Only specific program, Civil Insurance program has positive impact on health care utilization
Sosa-Rubi SG, Galarraga O, Harris JE (2009)	Seguro Popular Program (health insurance for the poor)	Access to obstetrical services for pregnant women	Multinomial Probit Model	2006 National Health and Nutritional Survey in Mexico	The Seguro Popular Program has positive impact on access to obstetrical services.

CHAPTER III

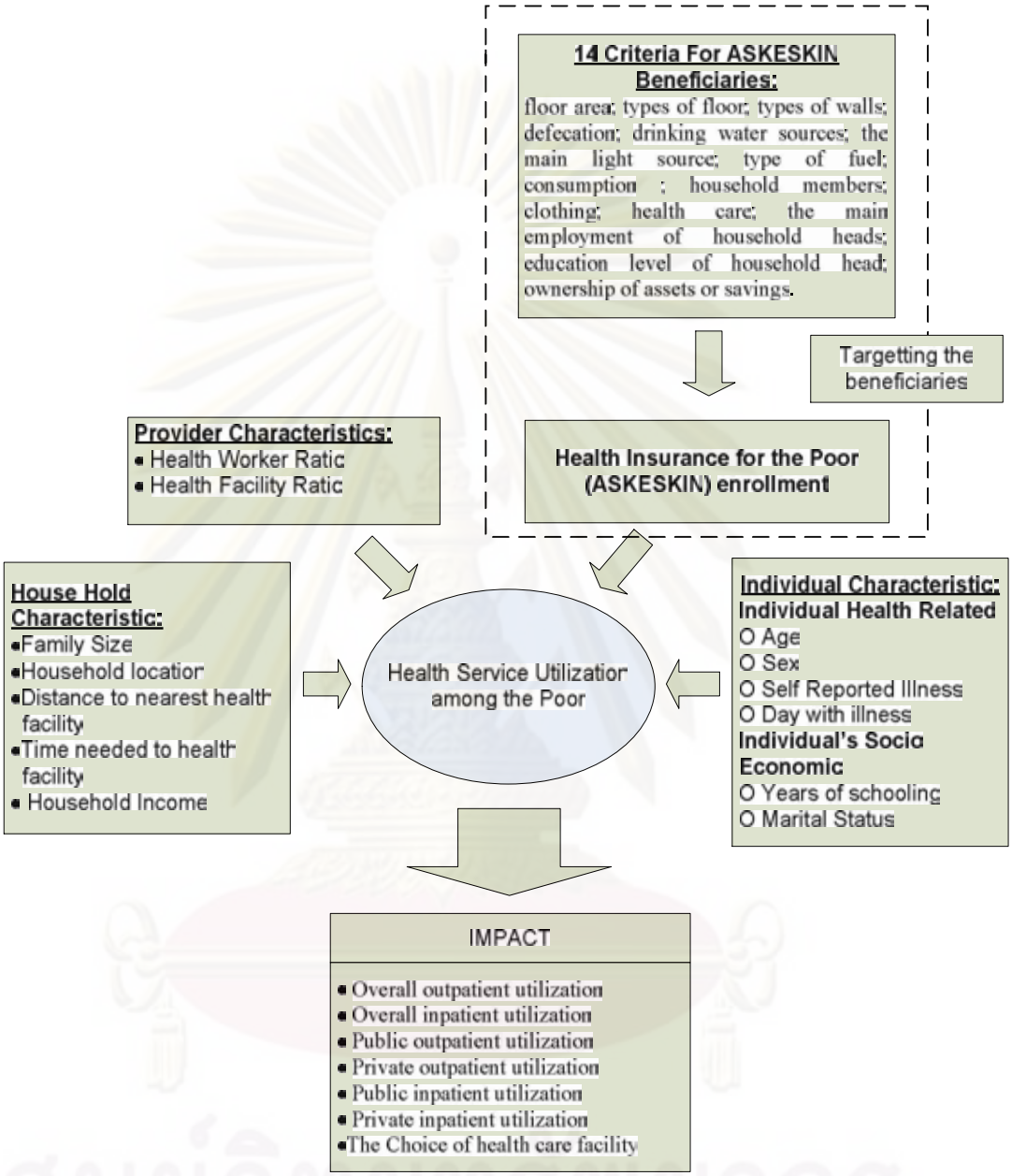
RESEARCH METHODS

This study is a descriptive cross sectional study using econometric techniques for its analysis. Secondary data of the year 2004 and 2007 are used in this study. The use of year 2004 and 2007 data reflects before and after ASKESKIN program implementation which was on 2005.

3.1 Conceptual Framework

The impact of ASKESKIN program will be measured in the term of overall outpatient utilization, overall inpatient utilization, public outpatient utilization, public inpatient utilization, private outpatient utilization, and private inpatient utilization (see Figure 3.1). Outpatient utilization will be measured as number of visit to the health care facilities, whilst inpatient care will be measured in number of bed days in health care facilities. This study will also analyze the pattern of health care choice for outpatient care among the poor who were enrolled in ASKESKIN scheme. Regarding with ASKESKIN program, the choice will be whether they visited public, private, or other health care facilities in their last visit in previous twelve months before the survey. Besides the ASKESKIN enrollment variable, other variables can be grouped into three characteristics: individual, household, and provider's characteristic. Individual characteristic are age, sex, self reported illness, day with illness, years of schooling, and marital status. ASKESKIN enrollment variable can be categorized also as individual characteristics because membership of this program is for each individual. Household characteristics are: family size, location (rural/urban), distance to the nearest health care facility, time needed to the health care facility and household income. Provider characteristics are: health worker ratio and health facility ratio in sub district level. Year of insurance will indicate the data 2004 and 2007 to represent the data before and after the implementation of ASKESKIN in the model. The fourteen criteria of ASKESKIN beneficiaries are set by BPS-Statistics Indonesia as basic criteria for district government to list the ASKESKIN beneficiaries. The criteria used as standard measurement of ASKESKIN beneficiaries in every district.

Figure 3.1 Conceptual framework



3.2 Method of Analysis

3.2.1 Theoretical Framework

The use of count data as dependent variable in health care utilization model is widely known in many empirical analysis. Two part model comes from two different decisions process while people decide to use health care services. First decision comes from individual who need health care services and the second decisions more likely influenced by provider's side such as prescription, revisit or reference system. Jones (2000) provided taxonomy to select the best model based on treatment of dependent variable. Logit or probit model usually used to estimate the probability of observing a positive value of y and with OLS on the sub-sample of positive observations. In term of latent variables (y*), we can write the model into:

$$y^*_{ji} = x_{ji}\beta_j + \varepsilon_{j,} j = 1,2$$

The hurdle model is given by,

$$y_i = y^*_{2i} \quad \text{if y*2i>0 and y*1i>0}$$

$$= 0 \text{ otherwise}$$

Conditional mean independence assumption is needed as

$$E(y_i \mid y_i > 0, x_{2i}) = x_{2i}\beta_2$$

In general the two parts does not required normality of $(\varepsilon_1, \varepsilon_2)$ and linearity $E(y \mid y > 0, x) = x$.

Maddala (2001) discussed about logit model and pointed out that there was an underlying or latent variable y* which we could not observe. Compared to the linier probability model that also used dichotomous variable, the linier probability model has important weakness, which was the conditional expectation $E(y_i|x_i)$ be interpreted as the probability that the event would occur and in many cases it could lie outside the limits(0,1). This will make difficult interpretation in its result. The major advantage of using logit model is the simple form for the choice probabilities. If we have a regression model with latent variable of y*:

$$y_i^* = \beta_0 + \sum_{j=1}^{k} \beta_j x_{ij} + u_i$$

$$y_i = 1 \text{ if } y_i^* > 0$$

$$0 \text{ otherwise}$$

The cumulative distribution of u_i is logistic, so in this case the logit model can be written as:

$$\log \frac{P_i}{1-P_i} = \beta_0 + \sum_{j=1}^{k} \beta_j x_{ij}$$

The $\log \frac{P_i}{1-P_i}$ is called the log-odds ratio which is a linier function of the explanatory variables.

Some general concerns should be considered related to Logit model. Since Logit model is using the method of maximum likelihood which is generally a large sample method, the estimated standard errors are asymtotics. In the result, instead of using t-statistics, the logit model used standard normal Z statistics. The inferences are based on the normal table. The similar measurement of R square is called pseudo R square, one of them that will be used in this study is Mc Fadden R Square. This Pseudo R Square is used to measure the goodness of fit, but one should be noted that in binary regressand model, the use of goodness of fit is second important compare to the expected sign of coefficients and their statistical significance.

The second part of positive data will be analyzed using semilog model. This model can be written as follows,

$$\ln Y_t = \beta_1 + \beta_2 X$$

The logarithmic distribution is used for a set of positive integers. The semi log functional form for dependent variable can be used to depict a situation in which an increase in X causes Y to increase at an increasing rate (Studenmund, 2001). We will use the Ordinary Least Square (OLS) to estimate this model. The slope coefficient measures the constant proportional or relative change in Y for a given absolute change in the value of regressors. In some literatures, β_2 is called semielasticity of Y with respect to X.

Multinomial logit model is used to model relationships between multinomial outcomes and a set of regressor variables. This model is an extension of the binomial logit that allows more than two discrete alternatives to be considered simultaneously. The dependent variable can be ordered or unordered. In the case of health care use, we can categorize the outcome as unordered. Multinomial logit model usually applies to the choice of insurance plan or health care provider (Jones, 1998). The model is as follows, (Greene, 2000):

$$\Pr(Y_i = j) = \frac{e^{\beta'_j x_i'}}{\sum_{k=0}^{2} e^{\beta'_j x_i'}}, \qquad \text{j=0, 1, 2..j}$$

Multinomial logit model will be estimated using the maximum likelihood procedures. By using Multinomial logit model, we can aggregate the use of health care and see the pattern of health care choice among the period. The use of Multinomial logit model usually correlates with the assumption that the alternative options provide distinct choices, have different attributes and can be considered to be mutually exclusive (Habtom & Ruys, 2007).

3.2.2 Targeting ASKESKIN Beneficiaries

To analyze the targeting of ASKESKIN program, we will use descriptive analysis by comparing the ASKESKIN beneficiaries' distribution among income quintile. We expect that ASKESKIN will fully distribute to the lowest income quintile group.

3.2.3 Model for Overall Health Service Utilization

In order to answer research question about the impact of ASKESKIN to health service utilization, we are following Ekman (2007), by conducting two models to estimate the probability of health utilization among the poor people. This related to dual decision to seek health care providers, first decision is the participation decision made by the people and the second decision is the positive count for the number of health care utilization after people decided to visit health care facility. In short, basically we distinguish health care utilization data into two parts. First part is if

people never come to health facilities. The second part of the data is people who used health care facilities at least once.

First model is using dependent variable as 1 if individual visited any health facilities whether is it public or private facilities and 0 if they did not visit any health facilities for outpatient or inpatient care when they got illness. In order to make ceteris paribus conclusion of health insurance effect, we control the determinant of health service utilization among the poor not only from health insurance for the poor (ASKESKIN) enrollment, but also other characteristics: individual (age, sex, marital status, self reported illness, day with illness, and years of schooling), house hold (family size, location, and income), and provider characteristics (health worker ratio, health facility ratio, and distance to the nearest health care facility. The overall health care utilization can be defined as overall outpatient utilization and overall inpatient utilization. The overall health care utilization is the total number of health care visit for outpatient and total number of inpatient day for inpatient. The overall outpatient utilization function can be defined as:

$$OU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

And for inpatient utilization as:

$$IU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

Where OU = Overall outpatient utilization
IU = Overall inpatient utilization
SEX = Sex
AGE = Age
URB = Household location
MAR = Marital status
YSCH = Years of schooling
SRI = Self reported illness
DILL = Day with illness
CONPC = Consumption per capita
INS = Health insurance for the poor enrollment

HFR = Health facility ratio

HWR = Health worker ratio

DIST = Distance to the nearest health care facility

FAMS = Family (Household) size

YINS = Dummy variable for year before and after ASKESKIN Implementation

The descriptions of the variables are explained latter in sub chapter 3.3. In this function we expect that ASKESKIN enrollment will have positive impact on the health service utilization for outpatient and inpatient cares among the poor. We develop econometric model for the probability of health care visit as,

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where P_i is a dummy variable of visiting health facilities (outpatient and inpatient) defined by

$$Pi = \begin{cases} 1, \text{ if visit health care facilities at least once or number of bed days at least one day} \\ 0, \text{ if not visit health care facilities} \end{cases}$$

The second econometric model is to analyze the number of visits to health care facilities for outpatient care and inpatient care. This model can reflect the number of utilization made by poor people after they decide to visit health care facilities. The decision here will be more likely influenced by provider's decision. Ekman (2007) used the term of "the intensity of health care utilization" for this function. The econometric model used is as follow,

$$\ln OU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

And

$$\ln IU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where OU = number of visit for outpatient utilization at least once time (greater than zero)

IU = number of bed days for inpatient utilization that equal or greater than one day.

3.2.4 Model for Public and Private Health Service Utilization

We expect that ASKESKIN enrollment will have positive impact on public health service utilization and negative impact on private health service utilization. Model for public and private utilization are intended to distinguish the impact of ASKESKIN program for public and private facilities. Each of facilities will consist of outpatient and inpatient utilization. Models for public and private utilization are as follow,

a. Public outpatient utilization

Public outpatient utilization can be modeled as:

$$PBOU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

Data of public outpatient utilization is modified to become binary variable, the econometrics model for this data is,

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where P_i is a dummy variable of visiting health facilities for outpatient care, defined by

$$\mathbf{Pi} = \begin{cases} 1, \text{ if visit public health care facilities for outpatient care at least once} \\ 0, \text{ if not visit health care facilities} \end{cases}$$

Number of visit to public health care facilities for outpatient care that greater than zero will be modeled using Log-Lin model,

$$\ln PBOU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where PBOU = Number of visits to public health facilities (>0)

SEX = Sex
AGE = Age
MAR = Marital status
URB = Household location
YSCH = Years of schooling
SRI = Self reported illness
DILL = Day with illness
CONPC = Consumption per capita
INS = Health insurance for the poor enrollment
HFR = Health facility ratio
HWR = Health worker ratio
DIST = Distance to the nearest health care facility
FAMS = Family size
YINS = Dummy variable for year before and after ASKESKIN Implementation

b. Private outpatient utilization

Private outpatient utilization can be modeled as:

$$PROU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

As before, data of private outpatient utilization is modified to become binary variable, then the econometrics model for this data is,

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where P_i is a dummy variable of visiting health facilities for outpatient care, defined by

$$P_i = \begin{cases} 1, \text{ if visit private health care facilities for outpatient care at least once} \\ 0, \text{ if not visit health care facilities} \end{cases}$$

Number of visit to private health care facilities for outpatient care that greater than zero will be modeled using Log-Lin model,

$$\ln PROU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where PROU = Number of visits to private health facilities (>0)
SEX = Sex
AGE = Age
MAR = Marital status
URB = Household location
YSCH = Years of schooling
SRI = Self reported illness
DILL = Day with illness
CONPC = Consumption per capita
INS = Health insurance for the poor enrollment
HFR = Health facility ratio
HWR = Health worker ratio
DIST = Distance to the nearest health care facility
FAMS = Family size
YINS = Dummy variable for year before and after ASKESKIN implementation

c. Public inpatient utilization

Public inpatient utilization can be modeled as:

$$PBIU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

Data of public inpatient utilization is modified to become binary variable, the econometrics model for this data is,

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where P_i is a dummy variable of visiting health facilities for outpatient care, defined by

$$Pi = \begin{cases} 1, \text{ if number of bed day in public health care facilities is greater than zero} \\ 0, \text{ not stay for inpatient care} \end{cases}$$

Number of visit to public health care facilities for inpatient care that greater than zero will be modeled using Log-Lin model,

$$\ln PBIU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where
- PBIU = Number of bed days in public health facilities (>0)
- SEX = Sex
- AGE = Age
- MAR = Marital status
- URB = Household location
- YSCH = Years of schooling
- SRI = Self reported illness
- DILL = Day with illness
- CONPC = Consumption per capita
- INS = Health insurance for the poor enrollment
- HFR = Health facility ratio
- HWR = Health worker ratio
- DIST = Distance to the nearest health care facility
- FAMS = Family size
- YINS = Dummy variable for year before and after ASKESKIN Implementation

d. Private inpatient utilization

Private inpatient utilization can be modeled as:

$$PRIU = f(\overset{+}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{SRI}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{+}{HFR}, \overset{+}{HWR}, \overset{-}{DIST}, \overset{+}{FAMS}, \overset{+}{YINS})$$

Data of public outpatient utilization is modified to become binary variable, the econometrics model for this data is,

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where P_i is a dummy variable of visiting health facilities for outpatient care, defined by

$$Pi = \begin{cases} 1, \text{ if number of bed day in private health care facilities is greater than zero} \\ 0, \text{ not stay for inpatient care} \end{cases}$$

Visit to public health care facilities for outpatient care that greater than zero will be modeled using Log-Lin model,

$$\ln PRIU = \beta_0 + \beta_1 SEX + \beta_2 AGE + \beta_3 MAR + \beta_4 URB + \beta_5 YSCH + \beta_6 SRI + \beta_7 DILL + \beta_8 CONPC + \beta_9 INS + \beta_{10} HFR + \beta_{11} HWR + \beta_{12} DIST + \beta_{13} FAMS + \beta_{14} YINS + \varepsilon$$

Where PRIU = Number of bed days in private health facilities (>0)
SEX = Sex
AGE = Age
MAR = Marital status
URB = Household location
YSCH = Years of schooling
SRI = Self reported illness
DILL = Day with illness
CONPC = Consumption per capita
INS = Health insurance for the poor enrollment
HFR = Health facility ratio
HWR = Health workers ratio
DIST = Distance to the nearest health care facility
FAMS = Family size
YINS = Dummy variable for year before and after ASKESKIN Implementation

Of data available, we have all sample whether they ill or not and whether they visit health care facilities or not. Analysis health service utilization based on an "ill" sample will have risk on endogenous selection from sample selection. Variable that potentially an endogenous variable is health status. To analyze the conditional estimates free from sample bias, we will imply logit model and conduct the analysis based on ill sample as well as on the entire data. Relating to the problem of endogeneity in health insurance variable, because of ASKESKIN program is mandatory health insurance, and not voluntary insurance, we can assume that health insurance variable is exogenous.

3.2.5 Model for the Pattern of Health Care Choice

The pattern of health care choice in this study will be assessed by modeling the choice of health care facility made by the poor when they got illness. In this function we want to distinguish between health facilities choices, not only from aggregate use of outpatient care or inpatient care. In Indonesia, beside public and private facilities, traditional healers or alternative medicine and self treatment are also well developed. For simplicity we will categorize traditional healers, alternative medicine and self treatment into one category as other facilities. This model will use the combined data of 2004 and 2007 to get comparison pattern before and after implementation of ASKESKIN program for outpatient care. We expect that after implementation of ASKESKIN program, the poor will increase the probability to visit modern facilities. Owing the availability of some variables related in this model, only health care facility choice for outpatient utilization was examined in this study. The pattern of health care choice function is,

$$COCF = f(\overset{-}{SEX}, \overset{+}{AGE}, \overset{+}{MAR}, \overset{+}{URB}, \overset{+}{YSCH}, \overset{+}{DILL}, \overset{+}{CONPC}, \overset{+}{INS}, \overset{-}{TIME}, \overset{+}{FAMS}, \overset{+}{YINS})$$

Where COCF = Choice of health care facility
SEX = Sex
AGE = Age
MAR = Marital status

URB = Household location
YSCH = Years of schooling
DILL = Day with illness
CONPC = Consumption per capita
INS = Health insurance for the poor enrollment
TIME = Time needed to health care facility
FAMS = Family size
YINS = Dummy variable for year before and after ASKESKIN Implementation

In the pattern of health care choice model, we want to study about the difference in the choice of public health facilities, private health facilities, and other facilities. The analysis will compare the choice in public health facilities to other facilities and private health facilities to other facilities. Other facilities, here are traditional healers, alternative medicine and self treatment is used as reference group.

The pattern of health care choice model includes individual characteristics such as sex, age, marital status, and years of schooling. The need of health care is represented by day with illness and number of families. We expect that under all conditions being equal, people with worst health status will lead to the need of health care and increase health service utilization. Consumption per capita related to consumer's ability to pay the health services. To identify the supply side in the model or health care providers we use variable of time needed to go to the facilities and household location (rural or urban). The availability of provider's data do not allow us to include health facility ratio variable and health worker ratio variable such that in the health care utilization models because no data available for number of traditional healers or alternatives medical treatments in the region. Data available only recorded modern health care facility and modern health personnel.

The econometrics model is multinomial logit (MNL) model, as the dependent variable can be categorized as 1, 2, or 3 whether poor people will seek care in public facilities, private facilities, or others. Other facilities are traditional or alternative medicines and also self treatment (consume modern or traditional drugs

without seeing health workers). This model assumed that the choice of health care facility is independent for each alternative (Greene, 2000). As it is difficult to determine the correct decision structure of poor people, further we assumed that health care decisions are not nested. We assumed that perceived benefits from treatment options are not correlated although the referral system in Indonesia is available. In order to get independent alternative, we will use the last outpatient visit.

Multinomial logistic regression analysis required non metric of dependent variable. Dichotomous, nominal and ordinal variables satisfy the level of measurement requirement. Multinomial logistic regression does not make any assumption of normality, linearity, and homogeneity of variance of independent variables.

This study intended to analyze OPD use conditional on an "ill" sample (Akin, 1998). We also conducted the same analysis on the entire sample (unconditional estimate) and found that no difference in the coefficients (sign and significant level). The ill sample was derived by grouping together all individuals who reported at least one symptom.

3.3 Variable and Operational Definitions

3.3.1 Variables for Health Care Utilization Models

The variables used in the model are listed in Table 3.1.

Definitions of dependent variables:

OU: Overall outpatient utilization

Overall outpatient utilization refers to all number of visits to public hospital, private hospital, clinics, Community Health Centre/Sub Community Health Centre (PUSKESMAS/PUSTU), and other health manpower practices for outpatient occurred in 2004 and 2007 at the samples. Outpatient cares utilization is number of visit to public facilities or private facilities in the 30 days prior to the interview. This study emphasizes on modern providers and do not include self treatments and traditional healers.

OI: Overall inpatient utilization

Overall inpatient utilization refers to all number of visits to public hospital, private hospital, Community Health Centre (PUSKESMAS), and other health manpower practices for inpatient care occurred in 2004 and 2007. This study uses number of inpatient day in the 12 months prior to the interview. Equal with overall outpatient, in this study only concern about modern providers and we do not include self treatments and traditional healers.

Table 3.1 Variables for health care utilization model

Category	Variable	
Dependent variable	OU	Overall outpatient utilization
	OI	Overall inpatient utilization
	PBOU	Public outpatient utilization
	PROU	Private outpatient utilization
	PBIU	Public inpatient utilization
	PRIU	Private inpatient utilization
Explanatory variables		
Individual characteristics (IND)	SEX	Sex
	AGE	Age
	MAR	Marital status
	DILL	Day with illness
	YSCH	Year of schooling
	SRI	Self reported illness
	INS	Health Insurance for the Poor (ASKESKIN) enrollment
Household characteristics (HHC)	FAMS	Family size
	URB	Household Location
	DIST	Distance to nearest health care facility
	CONPC	Consumption per capita
Provider characteristics (PVC)	HWR	Health worker ratio
	HFR	Health facility ratio
	YINS	Year of insurance

PBOU: Public outpatient utilization

We distinguish outpatient utilization between public and private. Public health care facilities are health care facilities run by government under Ministry of Health. There are: Community Health Centre/Sub Community Health

Centre (PUSKESMAS/PUSTU) and Public hospital. In this variable we sum up the number of visit to those facilities.

PROU: Private outpatient utilization

Private health care facilities are health facilities run by non government organization, either profit or non profit organization, there are: general practitioners, polyclinics, private clinics run by health workers (midwives and nurse) and private hospital.

PBIU: Public inpatient utilization

The public inpatient utilization is number of bed days in public health care facilities, which are public hospital and Community Health Centre/Sub Community Health Centre (PUSKESMAS/PUSTU).

PRIU: Private inpatient utilization

The public inpatient utilization is number of bed days in public health care facilities, which are private hospital and health manpower practice (physicians or midwives).

Definitions of explanatory variables:

SEX: Sex

Jutting (2003) used sex together with age and education as control variables to capture the differences in the need for health care. The variable is a dummy variable to reflect sex of the samples as follows:

SEX: 1 = Male

0 = Female

AGE: Age

This variable refers to the age of the individuals. Age is one of the individual characteristics that can affect people's health seeking behavior. In general,

the hospital admission rate and average length of stays will rise with increasing age (Anderson, 1973).

MAR: Marital status

This dummy variable reflects the marital status of the samples, consist of as follows:

MAR: 1 = Married

0 = Not married (single/divorced)

URB: Household location

The location related to the issue of remoteness, in fact that usually rural areas are remote areas with have many limitations compare to the urban areas, specially the availability of health care facilities. Many evidences from the previous researches that access to health care and health outcomes may differ between rural and urban. The rural areas face many problems compare to urban, i.e. rural residents are in poorer health, more likely to be uninsured, face financial barriers to get care, and incur higher travel burden when obtaining care (Laditka, Laditka & Probst, 2009). This dummy variable is indicating the location of the household, whether in rural or urban area.

Urb: 1 = urban

0 = rural

YSCH: Years of schooling

This variable indicates education level of the samples, by sum up the number of years in formal education. This variable is individual characteristic to capture the demand of health care and to indicate responses of seeking information. The relationship between educations as one of the socioeconomics characteristics was well documented in many previous studies. Education has direct and indirect effect to health care utilization. The direct effect can be explained as the more people are well educated, they will use more of health services. The indirect effect was with higher education, it will lead to less illness and fewer physician visits (Alberts, Sanderman, Eimers & Van den heuvel, 1997).

SRI: Self reported illness

Self reported illness is used to capture the need of health care. This variable reflect the state of someone who is experiencing health problem or psychological, either because of acute illness, chronic illness, accident, crime or anything else. This dummy variable is assumed to reflect the availability of health complaint such as: fever, cough, running nose, diarrhea, headaches, toothache, or others. Time preference of this illness is 30 days prior to the interview.

SRI: 1 = have health complaint

0 = do not have health complaints

DILL: Day with illness

Day with illness also used to capture the need of health care. This variable reflects number of the days which individuals suffered from health complaint so they could not work, go to school or do daily activities. We assume that the more people suffer from the illness the more she/he needs health care. This variable serves as a proxy for an individual's health status (Jutting, 2004).

CONPC: Consumption per capita

Income reflects the consumer's ability to pay. For non formal sector or households of subsistence farmers, it is very difficult to get exact income and sometimes also lead to bias. We then use household consumption as a proxy of income (Hjortsberg, 2003). The use of consumption as a proxy of income has already widely used and no doubt about its validity. Household consumption is amount of money (in Indonesian Rupiahs/IDR) that the household spent for goods and services in one month, including consumption for food and non-food. The source of consumption is from buying, self production and gift. To control the effect of household size, we use per capita household consumption by dividing total consumption in the household per month with number of household members.

INS: Health Insurance for the Poor enrollment

This study will emphasize the insurance variable that might affect the health care utilization among the poor. For each eligible individual in this study we

collect information about ASKESKIN enrollment, and then we will get information about the poor people with ASKESKIN membership and poor people without ASKESKIN membership. From the 2004 data available, we define this variable as health card enrollment. While from 2007 data, this variable represent individual's enrollment on health card program, SKTM and ASKESKIN program. The meaning of dummy variable is defined as follows:

INS: 1 = enroll in health insurance for the poor (health card / SKTM /ASKESKIN)

0 = not enroll in any health insurance program

HFR: Health facility ratio

The availability of health facilities in the village will guarantee the availability of health care for the people. Health facility ratio is ratio of modern health facilities (public and private) in sub district area. This ratio is calculated by dividing total number of health facilities in sub district with total number of population.

HWR: Health worker ratio

In this study we also consider not only demand side for health care but also supply side for health care. Instead of using number of health workers, we use ratio in order to be comparable with the demand of health care from total population. Health workers ratio is number of physician, midwives and nurses in district area divided with number of population in the sub district.

DIST: Distance to nearest health care facility

Distance to go to the nearest health facilities will show the access to health facilities. This variable reflects the minimum distance from village to the nearest health care facility. The measurement unit is on kilometer.

FAMS: Family size

Family size is the number of people who stayed in one household and have the same expenditure management and these people have already stayed or planned to stay for the next six months. We include Family size because it can have effects on the demand for health care.

YINS: Year of insurance

This dummy variable is reflecting the year data. The 2004 data is used to reflect the health utilization condition before implementation of ASKESKIN program and 2007 data is used to reflect after implementation of ASKESKIN program. This study divide the sample period based on data available and use dummy of year to show the difference in the regression models between two years data. The advantage of using dummy variable instead of using Chow test is that we can identify the difference in terms of intercept or the slope coefficient or both. The meaning of this variable is defined as follows:

YINS: 1 = individuals from 2007 data

0 = individuals from 2004 data

3.3.2 Variables for the Pattern of Health Care Choice Model

The identified variables are listed in table 3.2. The explanatory variables in the choice of health facilities model are almost the same with previous model. The number of individuals is different with individuals in health utilization model, because we only include selected individuals that answered detailed question about health care services, here included information of last visit for outpatient care in previous twelve months. In this model we do not include variables of health facility ratio and health worker ratio because data available do not include number of traditional or alternatives healers in the account. It should be noted that those two variables only include modern health care providers. Instead of using distance, we use time needed to the health care facility because data available for this specific samples. We assume that time can substitute the distance variable to measure the access to the health care facility. The explanation of variable as follows:

Definitions of dependent variable:

COCF: Choice of outpatient care facilities

This dummy variable is assumed to reflect the choice of outpatient care facilities. This variable reflected the choice of individual's last visit for outpatient care in the last twelve months prior to the interview. We categorized outpatient facilities

choice as public facilities, private facilities, and other facilities. Based on data available, others facilities are alternative medicine or traditional healers and self treatment.

COCF = 1, 2, 3

Where: 1 = Public outpatient care facilities

2 = Private outpatient care facilities

3 = Traditional/alternative health care facilities and self treatment

Table 3.2 Variables for choice of health facilities

Category	Variables	
Dependent variable	COCF	Choice of health care facility
Explanatory variables	SEX	Sex
	AGE	Age
	MAR	Marital status
	URB	Household location
	YSCH	Years of schooling
	CONPC	Consumption per capita
	DILL	Day with illness
	INS	Health Insurance for the Poor enrollment
	TIME	Time needed to health care facility
	FAMS	Family size
	YINS	Year of insurance

Definitions of explanatory variables:

SEX: Sex

This variable is a dummy variable to reflect sex of the individuals as follows:

SEX: 1 = Male

0 = Female

Gender as well as income, education, location and price of health care can affect an individual's decision to seek health care and the choice of the provider as already shown in many previous studies on household and individual demand in utilization of health care (Chawla & Ellis, 1999).

AGE: Age

This variable refers to the age of the samples. Variable of age is important variable of individual characteristics that also determine the need of health care. Children usually have different health care need compare to adult. But in this study we only include people in the working age (19-60 years).

MAR: Marital status

Marital status is one of the basic individual characteristics, usually it together with age and sex are used to determine the people's health care seeking behavior. The decision of married people for example was also influenced by their spouse's decision. This dummy variable reflects the marital status of the samples, consist of as follows:

MAR: 1 = Married

0 = Not married (single/divorced)

URB: Household location

The variable of household location can be used as household characteristics and also to differentiate provider's side. It has already common things in many countries that the health infrastructures between urban and rural areas are different (Ziller, Coburn & Yousefian, 2006). The urban areas usually have more health facilities compare to the rural areas. Physician per population ratios are generally lower in rural areas than in urban areas. This dummy variable is indicating the location of the household, whether in rural or urban area.

URB: 1 = urban

0 = rural

YSCH: Years of schooling

Year of schooling is also one of the individual characteristic. Some previous studies included this variable because different education level will imply to different health care seeking behavior. We expected that the more educated people, they will seek more on modern health care facilities (Mekonen, Yared & Mekonen, 2002).

CONPC: Consumption per capita

This variable is a variable as a proxy of income per capita. The use of income in the model is very important to demonstrate one of economic variables that do have influence on health care decision (Gertler ans Van der Gaag, 1990).

DILL: Day with illness

Day with illness also used to capture the need of health care. This variable is similar as perceived illness to represent the need factor (Jainghui, Cao, Henny, 1997). This variable reflects number of the day which the samples suffer from health complaint so they can not work, go to school or do daily activities.

INS: Health Insurance for the Poor enrollment

This study will emphasize the enrollment in the health insurance for the poor program to the pattern of health care choice. The meaning of dummy variable is defined as follows:

INS: 1 = enroll in health insurance for the poor (health card / SKTM /ASKESKIN)

0 = not enroll in any health insurance program

TIM: Time needed to health facilities

This variable reflects total time needed to go to health facilities, whether to public, private or traditional healers. For self treatment, time variable here should be time needed to buy medicine, but it was not recorded in the questionnaire. We assumed that people are less time consuming for self treatment. In the pattern of health care choice model, time variable is in the form of dummy variable. We assume that the shorter time to get to health facilities, people are more likely to seek care.

TIM: 1 = More than 30 minutes

0 = 30 minutes or less

FAMS: Family size

Family size also reflects the health care need among the poor. From one point of view, individual who comes from larger family size will have different decision in choosing health care facility. This is because family size also reflected the

financial back up in order to meet health care need. The more people in one household also mean that there will be many needs that should be meeting, not only health care but also other basic needs.

YINS: Year of insurance

This dummy variable is reflecting the year data. The 2004 data is used to reflect the health utilization condition before implementation of ASKESKIN program and 2007 data is used to reflect after implementation of ASKESKIN program. The meaning of this variable is defined as follows:

YINS: 1 = individuals from 2007 data

0 = individuals from 2004 data

3.4 Sources of Data

The target population of this study is poor people in Indonesia. The poor people criterions are taken from the Central Bureau for Statistics. Individual said to be poor if he/she can not meet the basic need, which can be measured in term consumption in Indonesian Rupiahs of food and non food.

This study uses Indonesia's National Socioeconomic Survey (SUSENAS) 2004 and 2007 data, which is multi topics survey held in all provinces in Indonesia. SUSENAS samples are households and all individuals in selected household will be interviewed. SUSENAS provides information on respondent's education, employment, socioeconomic and demographic characteristics, prevalence of self reported illness, as well as health care utilization and source of payment. The SUSENAS 2004 is chosen because this is the year before implementation of ASKESKIN and SUSENAS 2007 is chosen as comparison after the implementation of ASKESKIN. We choose 2007 instead 2005 or 2006 because ASKESKIN program is a nation wide program so it needed several preparations before can be fully implemented and also in this year, the management of ASKESKIN has not changed yet to JAMKESMAS. SUSENAS was held every year with different question (module), there are three kinds of modules: health and housing, consumption, and education. SUSENAS 2004 and SUSENAS 2007 is repeating survey for health and housing modules, so we can get information needed for this study. SUSENAS is

nationally representative cross section data which has sample of 249.376 households in 2004 and 278.352 households in 2007 across the country. Sampling design for SUSENAS is Two-Stage Sampling, which consists of two phases, the first phase is to choose census block by using PPS (probability Proportional to Size) then the second phase is to choose 16 house holds from the selected census block by using systematic sampling. The additional data to analyze health care facility choices will be collected from Basic Health Research (RISKESDAS) 2007. This survey was held by Ministry of Health and used the same sample of SUSENAS 2007. This thesis also will use supply-side data, which is a health care provider's data from Potential Village (PODES) survey.

Because SUSENAS data is not specific survey for poor people, we need inclusion criteria to get sample of the study. We will distinguish poor people from SUSENAS data using the lowest quintile of consumption per capita. Consumption here consists of food and non food consumption. Consumption used to approximate the income. Since children have different demand for health care and their decisions to seek care more likely influenced by adult, we only include population in working age or from 19 to 60 years (Hidayat, Thabrany, Dong & Sauerborn, 2004). The exclusion criterions are people who have higher percentile of consumption per capita; people bellow 19 years of age and over 60 years of age.

CHAPTER IV

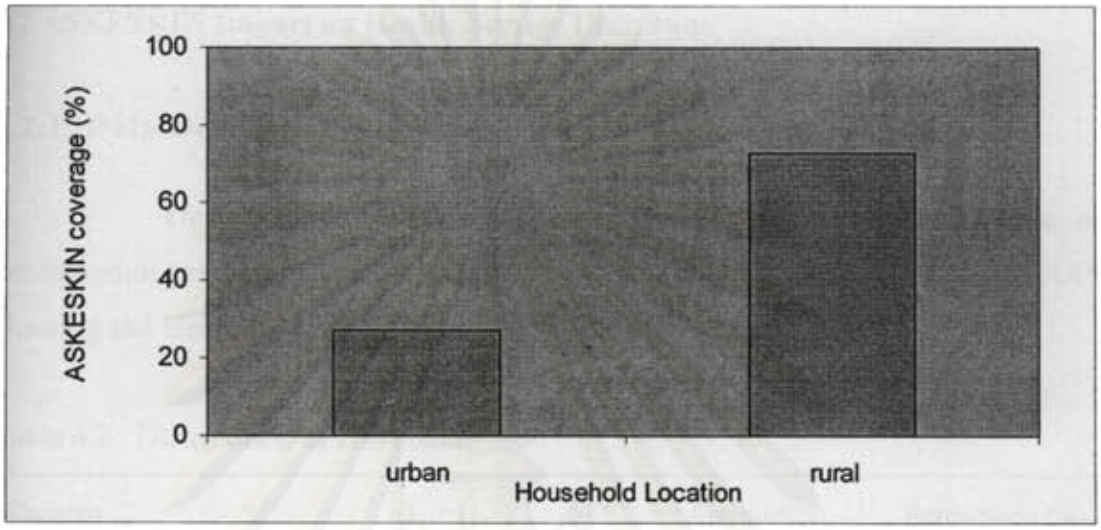
RESULTS AND DISCUSSION

In the previous chapter, the models for health care utilization and pattern of health care choice were developed. The hypothetical explanatory variables have been identified and elaborated for each model employed in this study. This chapter will show the results and discussion to answer research questions set in the first chapter of this study.

4.1 Descriptive Analysis of ASKESKIN Enrollment

Figure 4.1 Histogram of ASKESKIN coverage based on quintile of income (consumption per capita), 2007

Figure 4.2 Histogram of ASKESKIN coverage based on household location, 2007



According to Figure 4.2 the distribution of ASKESKIN in 2007 is mostly in rural area (73%) compare to the distribution of ASKESKIN in urban area which is only 27%. Based on the data, about 58.9% of population lives in rural area, whereas 41.1% lives in urban area.

Table 4.1 Distribution of population according to quintile of consumption per capita and household location, 2007

Quintile of Consumption per Capita	Rural (%)	Urban (%)
1	84	16
2	74	26
3	64	36
4	50	50
5	23	77

According to Table 4.1, the population in the lowest quintile is mostly living in rural areas (84%). The percentage of population who lived in rural area and urban area is equal in the fourth quintile. Whereas people in the highest quintile of consumption per capita mostly live in urban area (77%), it contrasts with the

percentage in rural areas which is only 23%. ASKESKIN enrollment here includes individual's enrollment in the previous program (health card and SKTM).

4.2 ASKESKIN Impact on Health Service Utilization

4.2.1. Data Description

The sample of this study was taken from the lowest quintile of consumption per capita and individuals aged between 19 to 60 years of SUSENAS Housing and Health Module 2004 and 2007, see Table 4.2 and Table 4.3.

Table 4.2 Distribution of 2004 data

Variable	Frequency	Percentage (%)
Number of samples	23,334	
Sex		
Male	11,392	48.8
Female	11,942	51.2
Household Location		
Rural	19,055	81.7
urban	4,289	18.3
Having Health Card/SKTM		
Yes	4,002	17.2
No	19,332	82.8
Self Reported Illness		
At least one disease	12,700	54.4
No illness	10,634	45.6
Marital Status		
Not Married	5,314	22.8
Married	18,020	77.2
Education		
Basic education	12,700	54.4
High school Education	2,245	9.6
Higher education	125	0.5
No education	8,264	35.5

According to Table 4.2, the number of female is a little bit larger than male. Most people in this study lived in the rural areas (81.7%) compare to them who lived in the urban areas (18.3%). People who have access to Health Card or SKTM (previous program on health care financing scheme for the poor) were only about 17.2%. From the education level, most samples only have basic education (9 years of schooling) and many of them do not have formal education (35.4%).

Table 4.3 Distribution of 2007 data

Variable	Frequency	Percentage (%)
Number of samples	25,282	
Sex		
Male	12,233	48.4
Female	13,049	51.6
Household Location		
Rural	21,008	83.1
urban	4,274	16.9
Health Card/SKTM/ASKESKIN enrollment		
Insured	7,176	28.4
Uninsured	18,106	71.6
Self Reported Illness		
At least one disease	7,926	31.4
No illness	17,356	68.6
Marital Status		
Not Married	5,431	21.5
Married	19851	78.5
Education		
Basic education	14156	56
High school education	2565	10.1
Higher education	186	0.7
No education	8,375	33.2

According to Table 4.3, the percentage between male and female is similar with 2004 data. Most people in 2007 data lived in the rural areas (83%). Health card and SKTM are included in the ASKESKIN enrollment with the percentage of individual's enrollment in this scheme is 28.4%. In 2007 data, the use

of these previous programs can also be accepted as ASKESKIN enrollment. The composition of education level is also similar with 2004 data, most of individuals are uneducated or only have basic education. Other data descriptions for selected variables is presented by mean and standard deviation in Table 4.4

Table 4.4 Descriptive statistics for selected variables, 2004 and 2007

Variables	Mean		Standard Deviation	
	2004	2007	2004	2007
Age (AGE)	35.65	36.32	11.10	11.16
Day with illness (DILL)	0.97	1.37	3.34	4.28
Consumption per Capita (CONPC)	91626.98	137113.4	16283.73	23119.73
Family Size (FAMS)	5.41	5.37	1.86	1.91
Health Worker Ratio (HWR)	0.81	0.62	0.54	0.48
Health Facility Ratio (HFR)	0.51	8.20	0.28	10.07
Distance (DIST)	5.71	1.33	7.30	3.46

According to Table 4.4, the average age for 2004 data is 35.65 years and 36.32 years for 2007 data. Mean of day with illness in 2007 data (1.37) is greater than 2004 data (0.97). Mean for consumption per capita in 2004 is 91,629.98 IDR and in 2007 is 137,113.38 IDR. House hold size for both years data give similar result, about 5 people in one household. Health facility ratio is much higher in 2007. This is because in 2007 data, there are some areas with high ratio of health facility selected in the study.

The outpatient utilization pattern among overall, public and private facilities can be seen in Table 4.5. In total, health care utilization in 2007 is higher than 2004. Comparing health care utilization for outpatient care between urban and rural areas, in general utilization in urban areas is higher than rural areas. In 2007 data, private provider utilization in rural areas has higher average of visits than in urban areas. The average of health utilization in public providers by female is higher than male. But in private providers, male seems to utilize more than female. Between ASKESKIN enrollees and non ASKESKIN, it showed that people under ASKESKIN program have higher average of outpatient utilization in general. The low average on outpatient visit when people got illness is because poor people instead of utilizing

public and private health care facilities, they also seek care on traditional healers, self treatment or not do anything even though they have symptoms.

Table 4.5 The average of outpatient care* (number of visits in previous month) at health care facilities

Outpatient care	All providers		Public Providers		Private Providers	
	2004	2007	2004	2007	2004	2007
Household location						
Urban	0.50	0.60	0.29	0.41	0.21	0.20
Rural	0.44	0.56	0.25	0.34	0.19	0.22
Sex						
Male	0.46	0.54	0.25	0.32	0.21	0.22
Female	0.43	0.60	0.26	0.38	0.17	0.22
Health insurance enrollment						
Insured	0.54	0.67	0.37	0.48	0.16	0.20
Uninsured	0.42	0.51	0.22	0.28	0.20	0.23
Total	0.45	0.57	0.26	0.35	0.19	0.22

* Calculated based on individuals who reported at least one symptom in the previous month

Table 4.6 The Average of inpatient care* (number of days in last twelve moths) at health care facilities

Inpatient care	All providers		Public Providers		Private Providers	
	2004	2007	2004	2007	2004	2007
Household location						
Urban	4.03	8.18	4.33	8.41	3.40	4.60
Rural	4.00	6.50	4.12	7.20	3.44	3.98
Sex						
Male	4.50	7.81	3.96	8.29	4.83	4.81
Female	3.69	6.22	4.37	6.90	3.14	3.65
Health insurance enrollment						
Insured	5.10	6.84	4.98	8.11	5.25	4.87
Uninsured	3.35	7.04	3.44	8.06	3.19	3.50

*Calculated based on individuals who reported inpatient care in each facility

According to Table 4.6, the average of bed days in 2007 is higher than 2004 in all providers, public providers or private providers. The average of bed days for inpatient care were calculated based on individuals who reported having inpatient

care in each facility in the previous twelve months. People in urban areas have higher average of inpatient care than rural areas. Female has lower average of bed days compared to male in general. People under insurance scheme in 2004 data have higher average of bed days than uninsured. In 2007, the average of inpatient care between insured and uninsured individuals is not greatly different.

The calculated probability from pooled samples showed that probability of individual to visit any health care facilities for outpatient care is 0.093. This is calculated from total number of people who visited health care facilities for outpatient care divided by total samples. Probability of individual to visit any health care facilities for inpatient care is 9.9.10-3. From individual's need of health care it has been a common pattern that inpatient care data has lower utilization rate compared to outpatient care.

4.2.2 Factors Affecting Overall Outpatient Utilization

We decided to use the entire sample for analysis of health care utilization over the sample that reported illness in the last thirty days because of possible endogeneity of illness and health care use, that is, if there are unobservable factors that are correlated with both the likelihood to report illness and to seek care. Estimation based on "ill" sample will be biased upward. To test for robustness of the results, we imply the same analysis on the "ill" sample and found no significant differences. The variable of self reported illness is dropped from both health utilization models (logistic regression and OLS estimation) because the variable exactly predicts the positive value of dependent variable.

The use of Likelihood Ratio (LR) is for null hypothesis testing which is all the slope coefficients are simultaneously equal to zero. The probability of LR statistics indicates to reject the null hypothesis, it means that all coefficients in regression model are not equal to zero simultaneously. We can conclude that the model of overall outpatient utilization regression model has significant overall fit and the model is accepted.

According to Table 4.7, age, sex, marital status, household location, years of schooling, day with illness, consumption per capita, health insurance for the

poor enrollment and year of insurance have significant relation with overall outpatient utilization.

Table 4.7 Logit estimated for overall outpatient utilization
(Dependent variable: OU)

Variables	Coefficient	z-Statistic	Prob.	Marginal Effect
C	-4.548	-34.266	0.000*	-0.0102
SEX	-0.150	-4.29	0.000*	-0.0102
AGE	0.019	11.144	0.000*	0.0013
MAR	0.382	2.215	0.000*	0.0261
URB	0.102	2.149	0.027*	0.0069
YSCH	0.010	50.008	0.032*	0.0007
DILL	0.199	6.697	0.000*	0.0136
CONPC	1.0E-04	13.235	0.000*	4.0E-06
INS	0.500	1.693	0.000*	0.0341
HFR	0.004	0.616	0.090	0.0003
HWR	0.022	-1.881	0.538	0.0015
DIST	-0.007	1.056	0.060	-0.0005
FAMS	0.010	-2.107	0.291	0.0007
YINS	-0.128	7.800	0.035*	-0.0087
McFadden R-squared	0.161			
LR statistic	4859.45			
N	48,616			

* Significant at 5%

Sex variable: Coefficient of sex variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of sex variable is negative; it implies that if individual is male, the logit goes down by 0.150, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of sex coefficient, we get 0.861. This suggests that male is 0.861 less likely to utilize health care facilities for outpatient care than female, other things remain the same.

Age variable: Coefficient of age variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of age is positive, it implies that if age increase by one year, probability to utilize health care facilities will increase by 0.019.

Marital status variable: Coefficient of marital status variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of marital status is positive; it implies that if individual is married, the logit goes up by 0.382, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of sex coefficient, we get 1.465. This suggests that married individual is 1.465 more likely to utilize health care facilities for outpatient care than single, other things remain the same.

Household location variable: Coefficient of household location variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of household location variable is positive; it implies that if individual lives in urban area, the logit goes up by 0.102, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of household location coefficient, we get 1.107. This suggests that people in urban areas are 1.107 more likely to utilize health care facilities for outpatient care than people in rural areas, other things are remaining the same.

Years of schooling variable: Coefficient of years of schooling variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of years of schooling is positive; it implies the more people have education, the logit goes up by 0.010, holding other variables constant. The marginal effect showed that people with higher years of schooling will have 1% higher probability of using health care facilities.

Day with illness variable: Coefficient of day with illness variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of day with illness is positive, it implies that if day with illness increase by one day, probability to utilize health facilities will increase by 0.199. The marginal effect showed that people with higher day with illness have 1.36% higher probability of using health care facilities.

Consumption per capita variable: Coefficient of consumption per capita variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of consumption per capita is positive, it implies that if consumption per capita increase by one IDR, probability to utilize health facilities will increase by 1.0E-04. The marginal effect showed that people with higher income have 4.0E-04%

higher probability to utilize health care facilities, although the percentage of this marginal effect value is very low.

Health insurance for the poor enrollment variable: Coefficient of this variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of health insurance enrollment is positive; it implies that if individual included in health insurance for the poor scheme (ASKESKIN), the logit goes up by 0.500, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of insurance enrollment coefficient, we get 1.649. This suggests that insured individual is 1.649 more likely to utilize health care facilities for outpatient care than uninsured individual, other things remain the same. The marginal effect coefficient showed that people under ASKESKIN scheme have 3.41% higher probability to utilize health care facilities compared to the non-ASKESKIN people.

Year of insurance variable: Coefficient of year of insurance variable was significant at 95% of confidence interval, the P-value is less than 0.05. We may accept the hypothesis that the two regressions have different intercept. The coefficient of year of insurance gives negative sign; in term of logit, it implies that in 2007, the logit goes down by 0.128, holding other variables constant.

Regression model to represent the number of outpatient visit after people decide to visit any health facilities was presented in Table 4.8. The model was estimated using OLS. The P-value of F statistics indicates to reject the null hypothesis of all coefficients in regression model is equal. It means that regression model have significant overall fit and model is accepted. R-square value is relatively low, only about 0.0925. According to Table 4.8, the variables those are statistically significant: marital status, day with illness, consumption per capita, insurance enrollment, distance and family size.

Marital status variable: Coefficient of marital status variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of marital status variable is positive; it implies that if individual is married, the median of outpatient visit is higher by 4.603% than non married, holding other variables constant.

Day with illness variable: Coefficient of day with illness variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of day with

illness variable is positive (0.019); it implies that if day with illness increases by one more day, the outpatient visit will increase by 1.99% holding other variables constant.

Consumption per capita variable: Coefficient of consumption per capita variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of consumption per capita variable is positive (1.0E-04); it implies that if consumption per capita increase by one IDR, the outpatient visit will increase by 0.001% holding other variables constant.

Table 4.8 OLS estimated for overall outpatient utilization
(Dependent variable: OU>0)

Variables	Coefficient	t-Statistic	Prob.
C	-0.069	-1.272	0.204
SEX	-0.025	-1.709	0.088
AGE	0.001	0.753	0.451
MAR	0.045	2.292	0.022*
URB	0.019	1.010	0.313
YSCH	-0.001	-0.346	0.729
DILL	0.020	20.267	0.000*
CONPC	1.0E-04	3.187	0.001*
INS	0.036	2.314	0.021*
HFR	0.001	0.762	0.446
HWR	0.002	0.145	0.885
DIST	0.004	2.402	0.016*
FAMS	0.013	3.560	0.000*
YINS	-0.019	-0.785	0.433
R-squared	0.093		
F-statistic	35.443		
N	4,534		

* Significant at 5%

Health insurance for the poor enrollment variable: Coefficient of health insurance for the poor enrollment variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of this variable is positive (0.036); it implies that if individual included in insurance scheme, the median of outpatient visit is higher by 3.6% than uninsured individual holding other variables constant.

Distance to the nearest health care facility variable: Coefficient of this variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of distance variable is positive (0.004); it implies that if distance to the nearest health care facility increase by one kilometer, the outpatient visit will increase by 0.4% holding other variables constant.

Family size variable: Coefficient of family size variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of family size variable is positive (0.013); it implies that if family size increase by one more people, the outpatient visit will increase by 1.3% holding other variables constant.

4.2.3 Factors Affecting Overall Inpatient Utilization

Table 4.9 Logit estimated for overall inpatient utilization
(Dependent variable: IU)

Variables	Coefficient	z-Statistic	Prob.	Marginal Effect
C	-7.599	-20.659	0.000*	
SEX	-0.308	-3.228	0.001*	-0.002
AGE	0.001	0.119	0.905	4.0E-06
MAR	0.523	3.909	0.000*	0.0034
URB	0.251	2.164	0.031*	0.0016
YSCH	0.035	2.768	0.006*	0.0002
DILL	0.102	20.954	0.000*	0.0007
CONPC	1.1E-05	4.600	0.000*	7.2E-08
INS	0.958	9.987	0.000*	0.0062
HFR	-0.023	-2.651	0.008*	-0.0002
HWR	-0.020	-0.186	0.853	-0.0001
DIST	-0.017	-1.075	0.283	-0.0001
FAMS	0.099	4.293	0.000*	0.0006
YINS	0.192	1.055	0.291	0.0012
McFadden R-squared	0.105			
LR statistic	565.8377			
N	48,616			

* Significant at 5%

The logit estimated for overall inpatient utilization and the marginal effect is presented in Table 4.9. As showed in this table, some variables which have significant effect on overall inpatient utilization are: sex, marital status, household

location, years of schooling, day with illness, consumption per capita, health insurance for the poor enrollment, health facility ratio and family size.

According to Table 4.9, the probability of LR statistics indicates to reject the null hypothesis, it means that all coefficients in regression model were not equal to zero simultaneously. We can conclude that the model of overall inpatient utilization regression model has significant overall fit and the model is accepted. The result as follows:

Sex variable: Coefficient of sex variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of sex variable is negative; it implies that if individual is male, the logit goes down by 0.308, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of sex coefficient, we get 0.735. This suggests that male is 0.735 less likely to utilize health care facilities for inpatient care than female, other things remain the same.

Marital status variable: Coefficient of marital status variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of marital status is positive; it implies that if individual is married, the logit goes up by 0.523, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of sex coefficient, we get 1.687. This suggests that married individual is 1.687 more likely to utilize health care facilities for inpatient care than single, other things remaining the same.

Household location variable: Coefficient of household location variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of household location variable gives positive expected sign; it implies that if individuals live in urban area, the logit goes up by 0.251, holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of household location coefficient, we get 1.285. This suggests that people in urban areas are 1.285 more likely to utilize health care facilities for inpatient care than people in rural areas, other things remain the same.

Years of schooling variable: Coefficient of years of schooling variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of years of schooling also give positive sign as expected; it implies the more people

have educated, the logit goes up by 0.035, holding other variables constant. The more educated people, they have 0.023% higher probability to utilize health care facilities for inpatient care.

Day with illness variable: Coefficient of day with illness variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of day with illness is positive, it implies that if day with illness increase by one day, probability to utilize health facilities will increase by 0.102. The marginal effect showed that people with higher day with illness have 0.07% higher probability of using health care facilities for inpatient care.

Consumption per capita variable: Coefficient of consumption per capita variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of consumption per capita is positive, it implies that if consumption per capita increase by one IDR, probability to utilize health care facilities will increase by 1.1E-05. The marginal effect showed that people with higher income have 7.2E-06% higher probability to utilize health care facilities for inpatient care.

Health insurance for the poor enrollment variable: Coefficient of health insurance for the poor enrollment variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of this variable is as expected, has positive result; it implies that if individual included in insurance scheme (ASKESKIN), the logit goes up by 0.958 holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of insurance enrollment coefficient, we get 2.604. This suggests that individual under ASKESKIN scheme is 2.604 more likely to utilize health care facilities for inpatient care than uninsured individual, other things remain the same.

Health facility ratio variable: This variable has coefficient of -0.023 and statistically significant. But it gives unexpected negative sign. It means that with other variables held constant, if health facility ratio increases by one more people, on average the estimated logit decrease by about 0.023.

Family size variable: This variable has coefficient of 0.099 means, with other variables held constant, that if family size increase by one more people, on average the estimated logit increases by about 0.099, suggesting a positive relationship between two. The coefficient of marginal effect suggests that people with higher

number of family size have 0.625 percent higher probability to visit health care facilities for inpatient care.

The number of individuals who reported inpatient utilization is less than the outpatient care. As shown in Table 4.10, the number of sample for the OLS estimation only 481. This estimation is to predict the overall inpatient utilization after people decides to come to health facilities or people who stayed in health care facilities at least one day. From this result we can see that the intercept is not statistically different from zero and only variable of marital status, day of illness and insurance are statistically significant. At 5 percent, the F value is statistically significant, in short we can accept the regression model as representative of the overall inpatient utilization.

Table 4.10 OLS estimated for overall inpatient utilization
(Dependent variable: IU>0)

Variables	Coefficient	t-Statistic	Prob.
C	0.975	3.206	0.001*
SEX	0.108	1.360	0.174
AGE	-0.001	-0.169	0.866
MAR	-0.325	-2.976	0.003*
URB	0.077	0.813	0.417
YSCH	-0.014	-1.364	0.173
DILL	0.018	3.674	0.000*
SRI	0.040	0.422	0.673
CONPC	8.2E-07	0.426	0.671
INS	0.300	3.771	0.000*
HFR	-0.006	-1.391	0.165
HWR	0.097	1.002	0.317
DIST	-0.013	-1.042	0.298
FAMS	0.027	1.353	0.177
YINS	0.131	0.924	0.356
R-squared	0.1462		
F-statistic	5.6992		
N	481		

* Significant at 5%

In this study, we emphasize on health insurance for the poor enrollment which has positive expected sign (0.300). It means that being other variables constant,

the insured people have higher median of overall inpatient utilization by 34.98 % than uninsured people. Number of day with illness also give positive sign (0.018), which means for one more day with illness, people will utilize more for inpatient care by 35.04%. Variables which can reflect the provider's side (health facility ratio and health worker ratio) do not give statistically significance result in the OLS estimation.

4.2.4 Factors Affecting Public Outpatient Utilization

Table 4.11 Logit estimated for public outpatient utilization
(Dependent variable: PBOU)

Variables	Coefficient	z-Statistic	Prob.	Marginal Effect
C	-4.93	-31.643	0.000*	
SEX	-0.253	-5.979	0.000*	-0.0106
AGE	0.020	9.736	0.000*	0.0008
MAR	0.328	2.622	0.009*	0.0137
URB	0.145	3.123	0.002*	0.0061
YSCH	0.018	43.62	0.000*	0.0007
DILL	0.131	2.221	0.026*	0.0055
CONPC	2.3E-06	17.852	0.000*	9.5E-08
INS	0.782	4.893	0.000*	0.0326
HFR	0.010	3.829	0.000*	0.0004
HWR	0.143	2.542	0.011*	0.0060
DIST	0.009	1.130	0.258	0.0004
FAMS	0.013	0.560	0.576	0.0005
YINS	0.039	5.677	0.000*	0.0016
McFadden R-squared	0.12646			
LR statistic	2698.145			
N	48616			

*Significant at 5%

After we generate model for overall outpatient and inpatient health care utilization, we continue to see the effect of ASKESKIN insurance program in public outpatient utilization. To test the null hypothesis that all the slope coefficients are simultaneously equal to zero we use the Likelihood Ratio (LR) statistic. According to Table 4.11, the LR statistic gives the result such that we can reject the null hypothesis and conclude that collectively all explanatory variables are statistically significant at 5% level. The McFadden R square value is quite low, only about 12.65%. Almost all explanatory variables are significant and give expected sign, except distance variable

and Variable of family size that are not statistically significant on effecting the public outpatient utilization.

Sex variable: This variable has negative sign and statistically significant at 5% level. The coefficient of -0.253 means, being male will imply on decreasing of logit by 0.253. From the odd term, it indicates that holding other variable constant, the male are 0.776 less likely to utilize public health care facilities compare with female.

Age variable: Although this variable is statistically significant at 5% but age variable has unexpected negative sign, which means that holding other regressors constant, if age increase by one year, on average the estimated logit decrease by amount 0.020.

Marital status variable: This variable is statistically significant at 5% level and has positive expected sign (0.328). The anti log of the coefficient give a result that married people use 1.389 more likely to visit public health care facilities.

Household location variable: This variable is statistically significant at 5% level and has positive expected sign (0.145). In term of odds, we can conclude that people who live in urban area will 1.156 more likely to visit public health care facilities for outpatient care holding other variable constant.

Year of schooling variable: The year of schooling is statistically significant and has coefficient of 0.018, it means with other variables held constant, that the more educated people, the estimated logit increased by about 0.018.

Day with illness variable: The day with illness coefficient of 0.137 means, with other variables held constant, that if day with illness increase by one day, on average the estimated logit increases by about 0.131, suggesting a positive relationship between two. The coefficient of marginal effect (0.0055) suggests that people with higher number of day with illness have 0.55 percent higher probability to visit public health care facilities for outpatient care.

Consumption per capita variable: The consumption per capita coefficient of 2.3E-06 means, with other variables hold constant, that if consumption per capita increase by one IDR, on average the estimated logit increases by about 2.30E-06, suggesting a positive relationship between two. The coefficient of marginal effect (9.5E-08) suggests that people with higher consumption have 9.5E-06 percent higher probability to visit public health care facilities for outpatient (very small indeed).

Health insurance for the poor enrollment variable: Coefficient of health insurance for the poor enrollment variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of this variable is as expected, it has positive sign; it implies that if individual included in insurance scheme (ASKESKIN), the logit goes up by 0.782 holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of insurance enrollment coefficient, we get 2.186. This suggests that people under ASKESKIN scheme are 2.186 more likely to utilize public health care facilities for outpatient care than uninsured people, other things remaining the same.

Health facility ratio variable: The positive sign of health facilities ratio is as expected. With the coefficient of 0.010 means that if the health facilities ratio increases by one percentage point, the logit goes up by 0.010 holding other variable constant. The coefficient of 0.0004 marginal effects suggests that the higher health facility ratio in the region, people have 0.04 percent higher probability of visiting public health care facilities.

Health worker ratio variable: The positive sign of health worker ratio is as expected. With the coefficient of 0.143 means that if the health facility ratio increase by one percentage point, the logit goes up by 0.143 holding other variable constant. The coefficient of 0.0060 marginal effects suggests that the higher health worker ratio in the region, people have 0.60 percent higher probability of visiting health facilities.

Year of insurance: This variable has positive sign and statistically significant at 5%. The coefficient of year of insurance variable is 0.039, we may accept the hypothesis that the two regressions have different intercept. In term of logit, it means that in 2007, the logit of people will come to utilize private health care facility for outpatient care is increasing by 0.039.

We distinguish data that have positive number of public outpatient utilization and estimate using OLS estimation as shown in Table 4.12. We test the null hypothesis that all coefficient equal to zero. We use F-test which is a measurement of overall significance for the estimated regression. The result showed that F-test is statistically significant, therefore we can reject the null hypothesis and accept that the model can represent the public outpatient utilization. The R-square seems low and might seem to be a disappointing value. But such low R-square values are frequently

encountered in cross sectional data with a large number of observations. The regression coefficient of marital status, household location, day with illness, consumption per capita, distance, family size are statistically different from zero, as shown using t-statistics.

The insurance enrollment variable has positive sign as expected although not statistically significant in the OLS estimation. People under insurance has median of public health utilization higher than people who are uninsured by 1.21 %.

Table 4.12 OLS estimated for public outpatient utilization
(Dependent variable: PBOU>0)

Variables	Coefficient	t-Statistic	Prob.
C	-0.037	-0.571	0.568
SEX	-0.022	-1.229	0.219
AGE	-0.001	-0.867	0.386
MAR	0.058	2.399	0.017*
URB	0.048	2.063	0.039*
YSCH	-0.004	-1.685	0.092
DILL	0.018	14.899	0.000*
CONPC	9.80E-05	2.328	0.020*
INS	0.012	0.648	0.517
HFR	0.001	0.861	0.389
HWR	0.006	0.376	0.707
DIST	0.006	3.286	0.001*
FAMS	0.012	2.654	0.008*
YINS	0.035	1.174	0.241
R-squared	0.089		
F-statistic	20.744		
N	2,785		

* Significant at 5%

Marital status variable: This variable is statistically significant and has positive sign. After the calculation, the coefficient of 0.058 means that holding other variables constant, the married people has median of utilization in public health care facility higher than single by 5.97%.

Household location variable: This variable is statistically significant and has expected positive sign. The coefficient of this variable is 0.048. After the calculation,

it indicates that people who lived in urban area will have median of utilization in public health care facility higher then people who live in rural area by 4.92%.

Day with illness variable: The coefficient of this variable is statistically significant and positive (0.018). It indicates the positive relation between days with illness with health utilization in public health care facilities. The higher people have day with illness, the number of public outpatient utilization will increase by 1.8%.

Consumption per capita variable: The coefficient of this variable is statistically significant and positive. It indicates the positive relation between consumption per capita with health utilization in public health care facilities. The higher consumption per capita, people will likely to have higher public outpatient utilization by 0.000982%.

Distance to the nearest health care facility variable: The coefficient of this variable is statistically significant but has unexpected positive sign. It indicates the positive relation between distances to the nearest health care facility with health utilization in public health care facilities**.**

Family size variable: The coefficient of this variable is statistically significant and positive (0.012). It indicates the positive relation between family size variable with health utilization in public health care facilities. The larger number of family size, the number of public outpatient utilization will increase by 1.2%.

4.2.5 Factors Affecting Public Inpatient Utilization

In this study we also emphasize on the effect of ASKESKIN enrollment on the public inpatient utilization. The result of the logit estimation for public inpatient utilization can be seen in Table 4.13. The LR statistics gives significant value, indicating that the overall model is satisfied enough to estimate the public inpatient utilization. The McFadden R square is relatively low, only about 0.119. The interpretation of significance variables as follows:

Marital status variable: This variable is statistically significant at 5% level and has positive expected sign (0.354). The anti log of the coefficient give a result that married people are 1.425 more likely to visit public health care facilities for inpatient.

Household location variable: This variable is statistically significant at 5% level and has positive expected sign (0.375). In term of odds, we can conclude that people who

live in urban area will be 1.455 more likely to visit public health care facilities to get inpatient services holding other variable constant.

Table 4.13 Logit estimated for public inpatient utilization
(Dependent variable: PBIU)

Variables	Coefficient	z-Statistic	Prob.	Marginal Effect
C	-8.270	-20.162	0.000*	
SEX	-0.155	-1.457	0.145	-0.0008
AGE	0.008	1.427	0.154	3.7E-05
MAR	0.354	2.439	0.015*	0.0017
URB	0.375	2.944	0.003*	0.0018
YSCH	0.027	1.923	0.055	0.0001
DILL	0.104	20.061	0.000*	0.0005
CONPC	1.1E-05	4.188	0.000*	5.5E-08
INS	1.103	10.266	0.000*	0.0053
HFR	-0.017	-1.882	0.060	-0.0001
HWR	0.014	0.118	0.906	0.0001
DIST	-0.005	-0.342	0.733	-2.5E-05
FAMS	0.104	4.046	0.000*	0.0005
YINS	0.231	1.150	0.250	0.0012
McFadden R-squared	0.119			
LR statistic	529.961			
N	48,616			

* Significant at 5%

Day with illness variable: The day with illness coefficient of 0.104, it means that with other variables held constant, if day with illness increase by one day, on average the estimated logit increases by about 0.104, suggesting a positive relationship between two. The coefficient of marginal effect suggests that people with higher number of day with illness have 0.050 percent higher probability to visit public health care facilities for inpatient care.

Consumption per capita variable: The consumption per capita coefficient of 1.10E-05 means that with other variables held constant, if consumption per capita increase by one IDR, on average the estimated logit increases by about 1.10E-05, suggesting a positive relationship between two. The coefficient of marginal effect (5.50E-08) suggests that people with higher consumption level or income have 5.50E-06 percent

higher probability to visit public health care facilities for inpatient care (very small indeed).

Health insurance for the poor enrollment variable: Coefficient of this variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of health insurance for the poor enrollment variable is as expected, it has positive sign (1.103); it implies that if individual included in insurance scheme (ASKESKIN), the logit goes up by 1.103 holding other variables constant. A more meaningful interpretation is in term of odds, by taking the anti-log of insurance enrollment coefficient, we get 3.013. This suggests that individuals under ASKESKIN scheme are 3.013 more likely to utilize public health care facilities for inpatient care than uninsured individuals, other things remain the same.

Family size variable: This variable has coefficient of 0.104 means, with other variables hold constant, if family size increase by one more people, on average the estimated logit increases by about 0.104, suggesting a positive relationship between two. The coefficient of marginal effect suggests that people from higher number of family size have 0.0503 percent higher probability to visit public health care facilities to get inpatient care.

We distinguish data that have positive number of public inpatient utilization and estimate using OLS estimation as shown in Table 4.14. We test the null hypothesis that all coefficient equal to zero. We use F-test to measure overall significance of the estimated regression. The result showed that F-test is statistically significant, therefore we can reject the null hypothesis and accept that the model can represent the public inpatient utilization. The model seems to be unsatisfied model since there are many variables that are not partial statistically significant. Only variable of day with illness and insurance enrollment variable are statistically different from zero, as shown using t-statistics. The significant variables as follows:

Day with illness variable: This variable give expected positive sign and can be interpreted as holding other variables constant, if the day with illness increase by one day, the utilization in public inpatient will increase by 1.7%.

Health insurance for the poor enrollment variable: This variable is statistically significant at 5 % level and give expected positive sign. It means that after people decide to come to public health care facilities for inpatient care, people who enrolled

in ASKESKIN scheme has median of public inpatient utilization higher than people who did not enroll in this scheme by 36.75 %.

Table 4.14 OLS estimated for public inpatient utilization
(Dependent variable: PBIU>0)

Variables	Coefficient	t-Statistic	Prob.
C	1.077	3.107	0.002*
SEX	0.029	0.333	0.740
AGE	-0.004	-0.974	0.331
MAR	-0.221	-1.828	0.068
URB	0.015	0.140	0.889
YSCH	-0.013	-1.162	0.246
DILL	0.017	3.727	0.000*
CONPC	1.6E-05	0.725	0.469
INS	0.313	3.494	0.0018*
HFR	-0.007	-1.650	0.100
HWR	0.052	0.483	0.629
DIST	-0.020	-1.499	0.135
FAMS	0.036	1.601	0.110
YINS	0.092	0.568	0.570
R-squared	0.13		
F-statistic	4.214		
N	380		

* Significant at 5%

4.2.6 Factors Affecting Private Outpatient Utilization

To see the effect of ASKESKIN on private outpatient utilization, we begin with testing the null hypothesis that all the slope coefficients are simultaneously equal to zero by using the Likelihood Ratio (LR) statistic. According to Table 4.15, the LR statistic gives the result that we can reject the null hypothesis and conclude that collectively all explanatory variables are statistically significant at 5% level. The McFadden R square value is quite low, or only about 12.1% of variation can be explained by the model. Variables of age, marital status, day with illness, consumption per capita, health facility ratio, health worker ratio, distance and year of insurance are statistically significant on affecting the private outpatient utilization.

Our main concern variable, which is health insurance for the poor enrollment is not statistically significant in the private outpatient utilization model. It has negative sign of -0.015. It means that the insured people are 0.985 less likely to visit private outpatient utilization compare with uninsured people, other things remind the same.

Table 4.15 Logit estimated for private outpatient utilization
(Dependent variable: PROU)

Variables	Coefficient	Prob.	Marginal Effect
C	-4.890	0.000*	
SEX	0.040	0.415	0.0012
AGE	0.015	0.000*	0.0004
MAR	0.420	0.000*	0.0122
URB	-0.095	0.151	-0.0028
YSCH	-0.004	0.558	-0.0001
DILL	0.130	0.000*	0.0038
CONPC	9.5E-06	0.000*	2.8E-07
INS	-0.015	0.794	-0.0004
HFR	-0.014	0.005*	-0.0004
HWR	-0.235	0.000*	-0.0069
DIST	-0.076	0.000*	-0.0022
FAMS	0.018	0.163	0.0005
YINS	-0.524	0.000*	-0.0153
McFadden R-squared	0.121		
LR statistic	1999.673		
N	48,616		

* Significant at 5%

Age variable: Coefficient of age variable was significant at 95% of confidence interval, the P-value is less than 0.05. The coefficient of age is positive, it implies that if age increase by one year, probability to utilize health care facilities will increase by 0.015. The marginal effect coefficient can be interpreted as the older people will utilize 0.04% more on private outpatient utilization compare with younger people.

Marital status variable: Coefficient of marital status variable was significant at 95% of confidence interval because P-value is less than 0.05. The coefficient of marital status is positive; it implies that married individual will lead the logit up by 0.420, holding other variables constant. A more meaningful interpretation is in term of odds,

by taking the anti-log of marital status coefficient, we get 1.522. This suggests that married individual is 1.522 more likely to utilize private health facilities for outpatient care than single, other things remaining the same.

Day with illness variable: The day with illness coefficient of 0.130 means that with other variables hold constant, if day with illness increase by one day, on average the estimated logit increases by about 0.130, suggesting a positive relationship between them. The coefficient of marginal effect suggests that people with higher number of day with illness have 0.378 percent higher probability to visit private health facilities.

Consumption per capita variable: The consumption per capita coefficient of 9.5E-06 means, with other variables held constant, that if consumption per capita increase by one IDR, on average the estimated logit increases by about 9.5E-06, suggesting a positive relationship between two.

Health facility ratio variable: This variable is statistically significant but has unexpected negative sign. The coefficient of health facility ratio is -0.014.

Health worker ratio variable: This variable is statistically significant but has unexpected negative sign. The coefficient of health worker ratio is -0.235, which less meaningful interpretation because of negative sign.

Distance to the nearest health care facility: This variable has negative sign, and statistically significant at 5% level. The coefficient of distance variable is -0.076, it means that the farther distance to health care facility, the odd to use private outpatient care will decrease by 0.076.

Year of insurance: This variable has negative sign and statistically significant at 5%. We may accept that the hypothesis that the two regressions have different intercept. The coefficient of year of insurance variable is -0.524; in term of logit, it implies that in 2007, the logit goes down by 0.524, holding other variables constant.

The OLS estimation will estimate the positive number of private outpatient utilization. The F-statistics to test overall model is statistically significant as shown in Table 4.16. Only some variables are partially significant in the model. Day with illness is statistically significant and has positive sign (0.017), indicating positive relationship among them. Consumption per capita and family size variables are also statistically significant and have positive relationship with number of visit to the private health facilities. The higher consumption per capita and the more people in

the family will increase the probability on utilizing private health facilities for inpatient care. The insurance enrollment variable is not statistically significant but give expected positive sign. It means that the number of outpatient visit in private health facilities is not affected by ASKESKIN enrollment.

Table 4.16 OLS estimated for private outpatient utilization
(Dependent variable: PROU>0)

Variables	Coefficient	t-Statistic	Prob.
C	-0.102	-1.257	0.209
SEX	-0.031	-1.533	0.125
AGE	0.001	0.727	0.467
MAR	0.030	1.069	0.285
URB	-0.047	-1.782	0.075
YSCH	0.003	1.049	0.294
DILL	0.017	12.858	0.000*
CONPC	1.4E-05	2.481	0.0132*
INS	0.036	1.539	0.124
HFR	-0.003	-1.403	0.161
HWR	1.0E-04	0.002	0.998
DIST	0.003	0.674	0.500
FAMS	0.013	2.284	0.023*
YINS	-0.028	-0.746	0.456
R-squared	0.0877		
F-statistic	14.4947		
N	1973		

* Significant at 5%

4.2.7 Factors Affecting Private Inpatient Utilization

To see the effect of ASKESKIN on private inpatient utilization we begin with testing the null hypothesis that all the slope coefficients are simultaneously equal to zero by using the Likelihood Ratio (LR) statistic. According to Table 4.17, the LR statistic gives the result that we can reject the null hypothesis and conclude that collectively all explanatory variables are statistically significant at 5% level. The McFadden R square value is quite low or only about 6.8% of variation can be explained by the model. Variables of sex, age, marital status, year of schooling, day

with illness, consumption per capita, insurance enrollment, health facility ratio are statistically significant on effecting the private inpatient utilization.

Table 4.17 Logit estimated for private inpatient utilization
(Dependent variable: PRIU)

Variables	Coefficient	z-Statistic	Prob.	Marginal Effect
C	-7.743	-9.543	0.000*	
SEX	-0.815	-3.776	0.000*	-0.0102
AGE	-0.023	-2.085	0.037*	-0.0011
MAR	1.236	-1.104	0.000*	-3.0E-05
URB	-0.293	2.470	0.269	0.0016
YSCH	0.068	6.538	0.014*	-0.0004
DILL	0.080	1.727	0.000*	0.0001
CONPC	8.9E-06	2.024	0.084	0.0001
INS	0.432	-2.436	0.043*	1.2E-08
HFR	-0.072	-0.372	0.015*	0.0006
HWR	-0.093	-1.757	0.709	-0.0001
DIST	-0.089	1.735	0.079	-0.0001
FAMS	0.086	0.382	0.083	-0.0001
YINS	0.157	3.588	0.703	0.0001
McFadden R-squared	0.068			
LR statistic	104.031			
N	48616			

* Significant at 5%

Sex variable: The coefficient of this variable is -0.815. The meaningful interpretation is in terms of odd, by taking the antilog of slope coefficient. The result is 0.443. This suggests that male are 0.443 less likely to utilize private health care facilities for inpatient care compare with female.

Age variable: The coefficient of this variable has unexpected sing of -0.023. It means that as with other variables hold constant, if age increase by one year, on average the estimated logit will decrease by about 0.023.

Marital status variable: The coefficient of this variable is 1.236. In terms of odd, by taking the antilog of slope coefficient the result is 3.446. This suggests that married people are 3.446 more likely to utilize private health care facilities for inpatient care.

Table 4.18 OLS estimated for private inpatient utilization
(Dependent variable: PRIU>0)

Variables	Coefficient	t-Statistic	Prob.
C	0.795	1.25	0.214
SEX	0.145	0.809	0.421
AGE	0.012	1.442	0.153
MAR	-0.716	-2.825	0.006*
URB	0.121	0.600	0.550
YSCH	0.005	0.223	0.824
DILL	0.031	2.641	0.010*
CONPC	-3.4E-06	-0.778	0.438
INS	0.137	0.807	0.422
HFR	-0.011	-0.445	0.658
HWR	0.412	1.698	0.093
DIST	0.053	1.128	0.262
FAMS	-0.001	-0.016	0.988
YINS	0.46	1.244	0.217
R-squared	0.277		
F-statistic	2.735		
N	107		

* Significant at 5%

Year of schooling variable: The coefficient of this variable has expected sign of 0.068. It means, if years of schooling variable increase by one year, on average the estimated logit will increase by about 0.068, holding other variables constant.

Day with illness variable: The coefficient of this variable has positive sign of 0.080. It means that as other variables hold constant, if day with illness increase by one day, on average the estimated logit will increase by about 0.080.

Consumption per capita variable: The coefficient of this variable has positive sign of 8.9E-06. It means that as with other variables hold constant, if age increase by one year, on average the estimated logit will increase by about 8.9E-06.

Health insurance for the poor enrollment variable: The coefficient of this variable is 0.432. The meaningful interpretation is in terms of odd, by taking the antilog of slope coefficient. The result is 1.541. This suggests that insured people are 1.541more likely to utilize in private health care facilities for inpatient services compare with uninsured people.

Health facility ratio variable: The coefficient of this variable has unexpected sign of -0.072. It means that if it increased on average the estimated logit will decrease.

The OLS estimation will estimate the positive number of private inpatient utilization. The F-statistics to test overall model is statistically significant as shown in Table 4.18. Only some variables are partially significant in the model: marital status, day with illness, and consumption per capita. The insurance enrollment variable is not statistically significant. But give expected positive sign.

4.3 ASKESKIN Impact on the Pattern of Health Care Choice

4.3.1 Data Descriptions

Selected individual were interviewed to complete detailed questionnaire on their health care information including information on last visit for outpatient care. Percentage distribution by health care for both years can be seen in Table 4.19 and 4.20. According to Table 4.19, in general people still rely on traditional and self treatment. Comparing between public health care facilities and private health care facilities, people still prefer to public health care facilities.

Table 4.19 Percentage distribution by health care facilities, 2004

Characteristics	Public health facilities (%)	Private health facilities (%)	Traditional/Self treatment (%)
Sex			
Male	20.0	16.4	63.6
Female	24.1	15.2	60.7
Marital Status			
Single	19.6	7.4	73.0
Married	22.4	17.3	60.3
Household location			
Rural	20.8	15.0	64.2
Urban	27.4	19.3	53.3
Time			
Less than 30 minutes	14.1	10.8	75.1
More than 30 minutes	59.6	39.2	1.2
Total	22.0	15.8	62.2

Table 4.20 Percentage distribution by health care facilities, 2007

Characteristics	Public health facilities (%)	Private health facilities (%)	Traditional/Self treatment (%)
Sex			
Male	16.84	15.29	67.87
Female	23.35	14.41	62.24
Marital Status			
Single	17.26	14.01	68.73
Married	20.78	14.97	64.25
Household location			
Rural	20.59	14.94	64.47
Urban	18.57	14.29	67.14
Time			
Less than 30 minutes	20.18	15.56	64.27
More than 30 minutes	20.38	10.97	68.65
Total	20.2	14.8	64.9

From Table 4.20, in 2007, health seeking behavior among the poor still has similar pattern with 2004 data. Between public health facilities and private health facilities, it seems that people still prefer to public health facilities. The high percentage of traditional healer or self treatment showed that this kind of treatment still become popular pattern in Indonesia, especially in rural areas. It is also shown that in 2007, people who choose public and private health care facility have smaller percentage compare to 2004.

Table 4.21 Mean and standard deviation for selected variables*, by provider, 2004

Variable	Total	Public health facilities	Private health facilities	Traditional/Self treatment
Observation	2368	521	374	1473
Age	38.16	37.619	36.63	38.74
	(10.60)	(10.07)	(9.89)	(10.91)
Years of schooling	4.07	4.436	4.0187	3.94
	(4.08)	(4.29)	(3.90)	(4.04)
Day with illness	3.31	3.71	3.72	3.06
	(5.26)	(5.22)	(5.20)	(5.27)
Consumption per capita	91349.49	94231.42	93265.34	89843.72
	(16701.73)	(14833.25)	(15006.65)	(17539.1)
Family size	4.85	5.03	5.05	4.75
	(1.72)	(1.749)	(1.72)	(1.71)

*Value in the bracket is standard deviation

According to Table 4.21, the average of age is 38.16 years, while the average year of schooling is 4.07 years. It appears that those who visited public health care facility have more years of schooling on average and more consumption per capita. The older people and less educated people are more inclined to seek care on traditional or self treatment. People with higher average of day with illness will prefer to seek care on modern health care facilities (public and private health facilities) rather than traditional healers or self treatment.

Table 4.22 Mean and standard deviation for selected variables*, by provider, 2007

Variable	Total	Public health facilities	Private health facilities	Traditional/Self treatment
Observation	2030	411	301	1318
Age	38.93	40.35	40.309	38.169
	(10.89)	(10.74)	(10.847)	(10.889)
Years of schooling	4.66	4.45	4.41	4.77
	(4.04)	(4.09)	(3.89)	(4.05)
Day with illness	4.35	4.69	5.81	3.91
	(6.64)	(6.63)	(8.51)	(6.09)
Consumption per capita	138119.5	135965.4	140172.9	138322.2
	(22984.13)	(24699.6)	(20772.63)	(22873.5)
Family size	5.29	5.27	5.17	5.33
	(1.88)	(1.87)	(1.69)	(1.92)

*Value in the bracket is standard deviation

According to Table 4.22, the average of age is 38.93 years, while the average year of schooling is 4.66 years. Years of schooling of 2007 data has a bit different pattern with 2004 data, in 2007, the more educated people, they appears to seek care on traditional or self treatment, although the differences among the percentage is also very small. The less average of day with illness, people will seek care on traditional or self treatment. The more average of consumption per capita, people seems to seek care on modern health facilities.

Table 4.23 shows the distribution of Health card program coverage (left column) and outpatient care use (right column). The proportion of health card coverage in 2004 is only about 22.38%. The distribution of health card by consumption per capita showed that the lowest quintile of the poorest has higher percentage of health card usage. In health care facility choices, each of quintile prefers to seek care on public health facilities rather than private health facilities. The

higher quintile of consumption per capita appears to choose more on public health care facility rather than other health care facilities. The utilization of private OPD do not show clear trend in favor of wealthier.

Table 4.23 Distribution of health card coverage and outpatient care (overall and per capita consumption quintile, 2004

		HEALTH CARD enrollment (%)		Outpatient care (%)		
		Yes	No	Public health facilities	Private health facilities	Traditional/Self treatment
Overall		22.38	77.62	22	15.79	62.21
By per capita consumption quintiles	1st	28.12	71.88	17.12	12.26	70.61
	2nd	25.95	74.05	20.04	14.77	65.19
	3rd	21.31	78.69	22.78	17.51	59.7
	4th	18.35	81.65	24.26	18.14	57.59
	5th	18.18	81.82	25.79	16.28	57.93

Table 4.24 Distribution of ASKESKIN coverage and outpatient care (overall and per capita consumption quintile, 2007

		ASKESKIN enrollment (%)		Outpatient care (%)		
		Yes	No	Public health facilities	Private health facilities	Traditional/Self treatment
Overall		34.43	65.57	20.25	14.83	64.93
By per capita consumption quintiles	1st	42.86	57.14	23.89	11.33	64.78
	2nd	34.73	65.27	21.43	17.24	61.33
	3rd	36.21	63.79	18.72	15.02	66.26
	4th	28.57	71.43	17.24	16.26	66.50
	5th	29.8	70.2	19.95	14.29	65.76

According to Table 4.24, the proportion of the individuals covered by ASKESKIN in 2007 is about 34.43 %. The distribution of ASKESKIN program by

consumption per capita showed that the lowest quintile of the poor has highest percentage of ASKESKIN enrollment. In health care facility choices, generally each quintile relies on traditional or self treatment. If we compare the choices only between public and private, people in the lower quintile will choose more on public health facilities. The table showed the tendency of poor people in using traditional healers or self treatment in their health care seeking behavior.

4.3.2 The Pattern of Health Care Choice

Table 4.25 Parameter estimation for Multinomial Logit model

Characteristics	Type of provider			
	Public health facilities		Private health facilities	
	Coefficient(β)	Standard error	Coefficient(β)	Standard error
Intercept	-1.281	0.402	-1.623	0.453
Sex	0.38*	0.082	0.043	0.09
Age	0.01*	0.004	-0.002	0.005
Marital status	-0.36*	0.116	-0.626*	0.142
Urb	-0.313*	0.103	-0.338*	0.114
Years of schooling	0.029*	0.011	-0.008	0.012
Consumption per capita	8.3E-06*	2.1E-06	1.0E-05*	2.4E-06
Day with illness	0.023*	0.007	0.036*	0.007
Insurance enrollment	-0.456*	0.087	0.233*	0.106
Time	-1.831*	0.102	-1.625*	0.113
Fams	0.041	0.022	0.036	0.025
Yins	0.627*	0.13	0.602*	0.147

Number of observation	4,398
-2Log likelihood	7389.299
Chi-square	568.302
McFadden R Square	0.073

*Significant at 5% , The reference category is traditional/self treatment

The result of parameter estimates using Multinomial Logit model is presented in Table 4.23. Other facilities means traditional healers and self treatment and used as reference group. This analysis will study the difference between public health facilities, private health facilities and other facilities choice using Multinomial Logistic regression. The analysis would compare other facilities to public health

facilities choice and other facilities to private health facilities choice. The detail of data processing result is provided in Annex. The presence of a relationship between the dependent variable and combination of independent variable is based on the statistical significance in the chi-square final model. Based on Table 4.23, the probability of the chi-square model (568.302) was 0.000, less than the level of significance of 0.05. The null hypothesis that there was no difference between the models without independent variables was rejected. The existence of a relationship between the independent variables and the dependent variable was supported. Data analysis of multinomial logistic regression also compute correlation measures to estimate the strength of the relationship (pseudo R square) i.e. McFadden R square or Nagelkerke's R square these correlation measures do not tell us much about the accuracy or errors associated with the model. To characterize our model as useful, we compare the overall percentage accuracy produced by data processing output. The classification accuracy rate was 66.4% which was greater than the proportional by chance accuracy criteria of 58.9%, see output sheet on Appendix. The criterion for classification accuracy is satisfied in this study.

There are two types of tests for individual independent variables: the Likelihood ratio test and the Wald test. The Likelihood ratio test evaluates the overall relationship between an independent variable and the dependent variable. The Wald test evaluates whether or not the independent variable is statistically significant in differentiating between the two groups in each of the embedded binary logistic comparison. Some variables that statistically significant as follows:

Sex variable: As shown in appendix, in the table titled Likelihood Ratio Test, the probability of the chi-square statistics (22.368) was 0.000; it is less than the level of significance of 0.05. There is a statistically significant relationship between sex variable and the choice of health care facility. As well, sex variable plays a statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). However sex variable does not differentiate the choice of private health care facility group from the traditional or self treatment (reference group), see Table 4.25. The outcome of public health care facility compared to traditional or self treatment, female was 1.463 more likely to choose public facility rather than traditional or self treatment. The outcome of private

health care facility compared to traditional or self treatment Female also was 1.044 more likely to choose private health care facility rather than traditional or self treatment.

Age variable: There is a statistically significant relationship between the independent variable of age and the dependent variable of choice of health care facility (0.021<0.05). As well, age is significant in distinguishing category of public health care facility from category of traditional or self treatment group (sig.of Wald test = 0.012<0.05). But the independent variable of age is insignificant in distinguishing category of private health care facility from category of traditional or self treatment category (sig.of Wald test = 0.643>0.05). For one year increase of age, the odds of being choosing public health care facility rather than traditional or self treatment increased by 1 %.

Marital status variable: As shown in appendix, the probability of the chi-square statistics (25.852) was 0.000 less than the level of significance of 0.05. There is a statistically significant relationship between marital status variable and the choice of health care facility. As well, marital status variable plays a statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). Marital status variable also successfully differentiate the choice of private health care facility group from the traditional or self treatment (reference group). The outcome of public health care facility compared to traditional or self treatment; married people were 1.435 more prone to choose public health care facility rather than traditional or self treatment. The outcome of private health care facility compared to traditional or self treatment; married people also were 1.870 more likely to choose private health care facility rather than traditional or self treatment.

Household location: The probability of the chi-square statistics (13.991) was 0.001 less than the level of significance of 0.05. There is a statistically significant relationship between household location variable and the choice of health facilities. Household location is statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). And also household location variable successfully differentiate the choice of private health care facility group from the traditional or self treatment (reference group). The

outcome of public health care facility compared to traditional or self treatment, people in rural areas were 0.732 less likely to choose public health care facility rather than traditional or self treatment. The outcome of private health care facility compared to traditional or self treatment, people in rural areas were 0.713 less likely to choose private health care facility rather than traditional or self treatment.

Years of schooling: There is a statistically significant relationship between the independent variable of years of schooling and the dependent variable of choice of health care facility (0.012<0.05). As well, years of schooling variable is significant in distinguishing category of public health care facility from category of traditional or self treatment (0.008<0.05). But the independent variable of years of schooling is insignificant in distinguishing category of private health care facility from category of traditional or self treatment category (0.512>0.05). For one year increase of schooling, the odds of being choosing public health care facility rather than traditional or self treatment increased by 2.9%.

Consumption per capita variable: There is a statistically significant relationship between the independent variable of consumption per capita and the dependent variable of choice of health care facility (0.000<0.05). As well, consumption per capita variable is significant in distinguishing both category of public health care facility from category of traditional or self treatment (0.000<0.05). And the independent variable of consumption per capita is significant in distinguishing category of private health care facility from category of traditional or self treatment category. For one IDR increase of consumption per capita variable, the odds of being choosing public health care facility rather than traditional or self treatment increased by 0.0008%. For one IDR increase of consumption per capita variable, the odds of being choosing private health care facility rather than traditional or self treatment increased by 0.0001%.

Day with illness variable: There is a statistically significant relationship between the independent variable of day with illness and the dependent variable of choice of health care facility (0.000<0.05). As well, day with illness variable is significant in distinguishing both category of public health care facility from category of traditional or self treatment (0.000<0.05). And the independent variable of day with illness is significant in distinguishing category of private health care facility from category of

traditional or self treatment category. For one day increase of day with illness variable, the odds of being choosing public health care facility rather than traditional or self treatment increased by 2.3%. For one day increase of day with illness variable, the odds of being choosing private health care facility rather than traditional or self treatment increased by 3.6%.

Insurance enrollment variable: This is variable of interest in this study, because this study will reveal the effect of ASKESKIN enrollment with the pattern of health care choice. The probability of the chi-square statistics (41.740) was 0.000 less than the level of significance of 0.05. There is a statistically significant relationship between insurance enrollment variable and the choice of health care facility. Insurance enrollment variable is statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). And also insurance enrollment variable successfully differentiate the choice of private health care facility group from the traditional or self treatment (reference group). The outcome of public health care facility compared to traditional or self treatment, people under ASKESKIN scheme were 1.577 more likely to choose public facility rather than traditional or self treatment. The outcome of private health care facility compared to traditional or self treatment, people without ASKESKIN coverage were 1.263 more likely to choose private facility rather than traditional or self treatment.

Time variable: The probability of the chi-square statistics (414.801) was 0.000 less than the level of significance of 0.05. There is a statistically significant relationship between time needed to health care facility variable and the choice of health facilities. Time needed to health care facility variable is statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). And also time needed to health care facility variable successfully differentiate the choice of private health care facility group from the traditional or self treatment (reference group). The outcome of public health care facility compared to traditional or self treatment, when time needed to health care facility is less than thirty minutes, people were 0.16 less likely to choose public facility rather than traditional or self treatment. The outcome of private health care facility compared to traditional or self treatment, when time needed to health care facility is more than thirty minutes,

people were 0.197 less likely to choose private health care facility rather than traditional or self treatment.

Year of insurance variable: The probability of the chi-square statistics (32.262) was 0.000 less than the level of significance of 0.05. There is a statistically significant relationship between years of insurance variable and the choice of health facilities. Year of insurance variable is statistically significant in differentiating the choice of public health care facility group from the traditional or self treatment (reference group). And also year of insurance variable successfully differentiate the choice of private health care facility group from the traditional or self treatment (reference group).

4.4 Discussion

4.4.1 Distribution of ASKESKIN Enrollees

Distribution of ASKESKIN program in 2007 has already shown pro poor pattern. The poorest level of income already got the biggest share of ASKESKIN enrollment. Among the poorest quintile, 36 percent of population are covered under ASKESKIN coverage, either through ASKESKIN card, health card or SKTM. Although not all the poorest people already enroll in this program, about 64 percent of people covered by ASKESKIN are with the poorest 40 percent of the population. While there is a leakage of ASKESKIN program to the non poor, about 18 percent of ASKESKIN coverage goes to the richest 40% of the population. The distribution of ASKESKIN program among rural-urban areas appears to be right on targeting the need. The ASKESKIN coverage in rural areas was 73%, compare to the percentage of people who live in rural areas which is 58.9% from total population, the ASKESKIN coverage has already represented the need of health insurance. Rural areas are identical with remoteness issues, lack of infrastructures and the important one is poverty issue. Based on BPS-Statistics Indonesia in 2007, about 20.37% poor people were live in rural areas, whilst 12.52% live in urban areas.

4.4.2 Health Utilization Models

ASKESKIN enrollment is statistically significant and has a positive relation on affecting the people's decision to come to the health facilities, people under ASKESKIN scheme are 1.649 more likely to visit health facilities for outpatient care. The ASKESKIN also affect on number of visits made by people to visit any health care facilities (both public and private) for outpatient care. People under ASKESKIN scheme have 3.6% higher median of health care visits compare to the uninsured people.

For the overall inpatient utilization, ASKESKIN gave higher effect compare to the overall outpatient utilization. People under ASKESKIN will be 2.604 more likely to utilize health care facilities compare to uninsured people. After people decide to come to health care facilities for inpatient care, the ASKESKIN also affect people's decision to stay for inpatient care. Using the OLS estimation, the insurance enrollment variable is statistically significant and has expected positive sign. People with ASKESKIN have 35.04% higher median of number of bed days compare to the uninsured people. The effect of ASKESKIN program appears higher for inpatient care compare to outpatient care. This is because the inpatient care usually related with catastrophic health cost so the program gives more hints for poor people. And also poor people usually use inpatient care only in severe condition, which need longer treatments.

ASKESKIN program mainly provide health care services in public health care facilities. The result showed that ASKESKIN influenced people to use public health care facilities for outpatient care. People under ASKESKIN program will be 2.186 more likely to visit health care facilities compared to uninsured people. Number of visit made by people after first visit is also influenced by ASKESKIN. People with ASKESKIN have 1.21% higher median of number of visit to public health care facilities for outpatient services.

For public inpatient utilization, ASKESKIN has positive effect in influencing the people's decision to seek care. People under ASKESKIN insurance were 3.013 more likely to use public health care facilities for inpatient care. ASKESKIN program provides third class of inpatient care in district hospital level or

higher. In Indonesian referral system, health care services are provided from the bottom provider which is community health centre. For diseases that required further inpatient care, patients will be sent to higher level of public health facilities i.e. district hospital. Some anecdotal findings showed that when people need inpatient care, they will seek for ASKESKIN enrollment even though they did not registered before (by using previous scheme of SKTM). This will make inpatient utilization will be increasing over time. People under ASKESKIN coverage have 36.75% higher median of number of bed days compare to the uninsured people.

Health insurance for the poor enrollment is not statistically significant in logistic regression model for private outpatient utilization. The people's decision to seek care for private outpatient care seems unaffected by ASKESKIN enrollment. Insurance enrollment also can not explain the decision to the number of visit to the private health care facilities. In private outpatient utilization model, year of insurance variable was negative and statistically significant to the private outpatient logit model. It means that after ASKESKIN was launched people were less likely to visit private outpatient utilization. This confirmed the fact that ASKESKIN coverage is mostly provided in public health facilities and very limited in private health facilities, particularly for outpatient care. The finding also might be related to the price of private health care services, that usually higher than public, and also the people's perception about their illness, for outpatient care usually associated with non seriousness symptom that made poor people might choose another cheaper treatment rather than private health care facilities.

ASKESKIN scheme affected people's decision to seek care in private inpatient utilization. Inpatient utilization usually associated with catastrophic cost especially for the poor. In some areas where public health facilities are still rare, government also collaborates with private health care facilities to provide services especially inpatient services. But ASKESKIN enrollment can not explained the OLS estimation for number of bed days by the poor. As noted by Gurmu (1997), possible difficulties related to the hurdle model are when the proportion of zeros is very high and the decision depends on unobserved supply characteristics, it might be difficult to estimate the second part of the model. It was also suggested that researcher should focus on first model by using binary models. It is confirmed that decision for inpatient

care usually for unavoidable reason such as emergency case or special treatment of particular diseases.

Sex variable is statistically significant and has expected negative signs in overall outpatient, overall inpatient, public outpatient, and private outpatient models. Female were more likely to seek care compared to male. In some treatment, female usually need more treatment, such as maternal care. But this is out of scope in this study because in this study we do not distinguish health treatments received by people. Marital status variable is statistically significant in all logit models. It has positive sign, means that married people were more likely to use health care. This result confirmed the previous findings by (Nandakumar, Chawla & Khan, 2000), that married individuals are significantly more likely to seek care. With respect to other characteristics affecting the demand for health care, in this study which was used individuals of 19-60 years, it is showed that older people will be more prone to utilize for outpatient care in public or private health care facilities. Age variable is statistically significant in logistic regression model but not in OLS regression. The possible explanation considering this result is in OLS regression the decision to consume more on health care services is more likely influenced by provider's decisions. Another model which is involved age square instead age variable in the model is used to check whether age has non linier pattern. The result showed that age square is insignificant, or we can assume that age has linier characteristic. The household location which is urban or rural area also gave positive effect on outpatient and inpatient care especially on public health care facilities. People who lived in urban areas more likely to utilize public health facilities compare to people who lived in rural areas. The possible explanation for this, because health facilities and health workers are more available in the urban areas.

Education aspect in the study which represented by years of schooling variables, showed that education level has a significant positive effect on health utilization (overall outpatient, overall inpatient, public outpatient, and private inpatient). The more educated people, they will more likely visit health facilities. This is consistent with other previous study related with health utilization, such as Nandakumar, Chawla & Khan (2000) observed that people in the lowest education group are significantly less likely to visit health facilities compare to those with

higher education. The family size variable is statistically significant and gave positive in most health utilization models. As confirmed by the previous study, the family size will reflect the health care need in general.

Day with illness clearly reflected the health care need among poor people in this study. This variable is statistically significant and gave positive effect to health care utilization, both public and private health care facilities. The longer days with illness, people will more likely to seek care to health care facilities. Some studies use severity of illness (Habtom & Ruys, 2007) as proxy for need of care, illness frequency and type of illness (Jutting, 2004), which also gave significantly positive effect on health care utilization.

Consumption per capita is used as a proxy of income and reflects individual's ability to pay for health care services. This variable is statistically significant affecting health utilization. The higher income level will lead people to be more likely to utilize health care facilities. This can be explained that although there is health insurance available for the poor, the health care seeking process itself is not 100 percent free. People's decisions to seek care also influenced by financial support i.e. transportation cost.

The variables that represented health care provider are health facility ratio, health worker ratio, and distance to the nearest health care facility variable. The result of these variables showed inconsistency of expected sign. Health facility ratio is statistically significant with negative sign in the logit model of private outpatient and private inpatient utilization but it gave positive sign in public outpatient care. It means that the more health facilities in the region, poor people were less likely to visit the private health facilities but the more health facilities will make people more likely to visit public health facilities for outpatient care. Health worker ratio gave positive sign on public OPD but negative sign on private OPD. It seems to be the substitution between public and private health facilities. But it was out of scope, because we can not isolate the effect of substitution among two facilities. Since the beginning of ASKESKIN program, government has already increased the number of health care facilities although it was also reported that some of health care facilities (mainly public) still lack of health workers. Other factors such as distance also give important role on decision to seek care. Although there are many health care facilities but if

individuals feel that it will be more expensive or time consuming, they will turn into other option. Distance to the nearest health care facility variable also did not give satisfactory result in this study. This variable was statistically significant and has negative sign in logit model of private OPD but did not give consistent sign in OLS model. In sort the provider's side influenced individual's decision to seek care especially in public outpatient utilization.

From the year of insurance variable result, we can conclude that there is no structural change of health utilization regression between 2004 and 2007. We also tried to run another model which involved interaction term between year of insurance variable and health insurance for the poor enrollment variable to capture the source of difference between two regressions. The logistic regression for outpatient utilization models gave statistically significant of differential intercept coefficient and insignificant differential slope coefficient, thus the two regression lines are parallel. The sign of coefficient is positive for overall and public OPD but negative sign for private OPD. The explanation related to this result of course that in 2007, the ASKESKIN program already fully implemented for the poor people which mostly cover both OPD and IPD in public facilities.

4.4.3 The Pattern of Health Care Choice Model

In health care choice model using multinomial logit, it should be note that the choice of health care facility made by the poor in this study only for outpatient care. This study emphasize on the effect of ASKESKIN program to the choice of health care facility. This study has already shown that the pattern of health care choices among poor people was affected by ASKESKIN enrollment. As expected, the insurance enrollment variable is statistically significant. The effect of ASKESKIN is larger in public health care facility than in private health care facility (0.456>0.233). People under ASKESKIN scheme will be more likely to choose public health care facility rather than traditional or self treatment. People with ASKESKIN enrollment will less likely to choose private health care facility. One possible explanation is because ASKESKIN mainly provide its services in the public health care facilities.

Among the individual characteristic, sex and marital status appear to be statistically significant in the choice of a health care provider. Being female or being married was more likely to choose public or private facilities, rather than traditional or self treatment. In previous study in Kenya, Mwabu (1986) found that women were more likely to consult to modern providers than self-treatment compare to men. The possible explanation given that there were more women than men in population, women would be more prone to illness due to obstetric need, and women usually accompany their children to health facilities, and seek treatment at the same time.

It appears to be strong link between age and the type of care. In this study we only include people in working age between 19 to 60 years. As pointed out by Dor, Gertler & Van der Gaag (1987) that child have different health care demand. The variation of age was expected to be statistically significant in the type of care. Damen (2003) found that the older people in Ethiopia are more likely to visit distant and higher level health care facilities.

The household location is statistically significant in the choice of health care facility. People in rural areas were less likely to choose private health care facility compare to traditional healers or self treatment. Although the number of public health care facility continues to grow from time to time, people in rural areas still have tendency to rely more on traditional healers or self treatment. It also related with variable of time. Variable of time is statistically significant but did not give satisfactory explanation because interpretation of negative sign said that less time needed to go to health care facility will make people were less likely to choose public or private health care facility compare to traditional healers or self treatment. One possible reason for this counterintuitive result is that in the data of self treatment group, the value of travel time was always zero.

Years of schooling appears to be statistically significant in the choice of health care facility. But it should be noted that only public health care facility choice is statistically significant. This finding appears to confirm the hypothesis that more educated people will choose more on modern health care facilities as shown by Mekonen, Yared & Mekonen (2002). They study about utilization of maternal health care services in Ethiopia and showed that women with primary education are more

two and half times higher on the use of maternal health services than uneducated women.

Day with illness is positive and statistically significant in the choice of health care facility. It was also positive across the public health care facility choice and statistically significant in the choice of private health care facility. The longer day with illness can be associated with severity of illness. This indicates rational decisions when the poor people choose health care facility which appropriate with their health condition. The coefficient is larger for the private health care facility. The possible explanation about this is that in emergency case or certain conditions, people will visit reachable health care facility, in this case is private facilities, i.e. general practitioners or health workers practitioners which open every day whereas the public health facilities such as community health centre only open during working days. It is also common for poor people to do self treatment and visit health care facilities after the illness get worst.

Consumption per capita has a positive coefficient and statistically significant in the choice of health care facility. More consumption per capita appeared to be positively correlated with the choice to seek care on modern health care facilities rather than traditional or self treatment. The effects are larger for the choice of private health care facility (β=0.084). It confirmed the facts that in public health care facility, poor people can use ASKESKIN card to get free services whilst private health care facility needs higher availability to pay compare to the public health care facility. And also in some areas, private health facilities i.e such as physician clinics or midwives clinics already widely provided, compare with public health facilities such as community health centre or hospital. This will made easier access to modern health care facilities. But it should keep in mind that Indonesia consists of many islands that create geographical barriers and asymmetric development especially between western and eastern Indonesia. Many efforts have been done by government of Indonesia in order to accelerate health care development for all Indonesian regions. One of health policy in Indonesia to increase the availability of health care providers in the community is that: health workers such as physician and midwives can run private clinics after their working hour. And also the previous program of village midwives (Bidan di desa), that made more midwives have replacement in the rural areas.

CHAPTER V

SUMMARY AND CONCLUSIONS

ASKESKIN program is one of government's commitments to assist the poor and indigent people. The Benefit of this program is giving free services for its members. The insurance includes outpatient care in community health centre and third class inpatient care in district hospital, and it is regulated in terms of referral system. The main purpose of ASKESKIN program is to increase health care utilization and quality of care among the poor. Some problems emerged since this program was nationally launched in 2005. Anecdotal evidence showed that non poor people enjoyed the program and the poor people actually get less benefit from ASKESKIN. This study will analyze the distribution of ASKESKIN among the poor and whether ASKESKIN program affect health care utilization among the poor. The study will investigate how the ASKESKIN program affects pattern of health care choice among the poor. This study also can be used to evaluate whether ASKESKIN program has been successful on its purpose of increasing health care utilization among the poor.

This study uses data from Indonesia's National Socio Economics Survey (SUSENAS) 2004 and 2007, not all variables and individuals are included. Only About 48,616 individuals are taken from the data. Individuals from the lowest quintile of consumption per capita and between 19 to 60 years of age are included in the study. The health facility data was taken from PODES data 2005 and 2008. About 4,398 selected individuals are drawn to analyze the effect of ASKESKIN program in the pattern of health care choice. Descriptive statistics is used to describe the distribution of ASKESKIN program among the poor. Hurdle model is used to analyze the effect of ASKESKIN program in health care utilization, this model distinguished the data into two parts and regress it separately using logistic regression and OLS regression. The effect of ASKESKIN program on health care utilization will be analyzed in terms of overall outpatient utilization, overall inpatient utilization, public outpatient utilization, private outpatient utilization, public inpatient utilization, and private inpatient utilization. The pattern of health care choice can be seen as individual's decision to choose certain health facilities. In order to make ceteris

paribus conclusion of health insurance effect, the study also controlled the determinant of health service utilization among the poor not only from ASKESKIN enrollment, and year of insurance but also other characteristics: individual (age, sex, marital status, self reported illness, day with illness, and years of schooling), house hold (family size, location, and income), and provider characteristics (health worker ratio, health facility ratio and distance to the nearest health facilities). The pattern of health care choice model did not use variables of health facility ratio, health worker ratio, and distance because of data availability.

As has been discussed in the previous chapter, the analysis can provide insight of the effect of ASKESKIN program to health care utilization. Even though some difficulties related to the econometrics arise when analyzing the ASKESKIN effect, the estimated models were generally satisfactory and can provide valuable implication for future policy. Using descriptive analysis, the study showed that ASKESKIN program has already reached the poor people as the main target of its program. The distribution of ASKESKIN enrollees was mostly on the lowest income (using consumption per capita as a proxy of income). In addition it should be noted that there was also small leakage of the program to the non poor. The main goal of ASKESKIN program is to increase access and quality of health services among the poor people. In this study we have pointed out that ASKESKIN has positive effect on overall outpatient utilization and overall inpatient utilization, public outpatient utilization and public inpatient utilization and private inpatient utilization. ASKESKIN do not significantly affect the private outpatient utilization among the poor in Indonesia. The pattern of health care choice among the poor people was affected by ASKESKIN coverage. The insured poor people will be more prone to choose public or private compare to the self treatment, which has already become main treatment pattern in Indonesia.

This study also reveals that day with illness and consumption per capita give consistent effect on health care utilization among the poor. Overall outpatient and inpatient utilization as well as utilization in public and private health care facilities were increasing along with the more days with illness and higher consumptions per capita. Other individual characteristics such as sex, age, and marital status were also statistically significant in affecting health care utilization, although it

is varied in coefficients. The older people seems to utilize more on overall outpatient care, but insignificant for inpatient care. Female are more likely to use more on overall outpatient and inpatient health care utilization. Married individuals are also more likely to utilize health care for all health care facilities. Education is important factor in health care utilization model and proved to be statistically significant in affecting health care utilization. In the pattern of health care choice model, marital status and household location are statistically significant affecting the choice of health care facility among the poor. Married individuals will choose more on public and private facilities rather than traditional or self treatment. The higher consumption per capita and the longer day with illness will lead people in choosing more on modern health care facilities.

Some policy implications can be derived from this study, as follows: The classic problem of poor's aid program usually lays on the targeting beneficiaries' issues. Although some criteria have been set by BPS-Statistics Indonesia to determine the ASKESKIN member, each region should imply their specific characteristics because of the diversity among Indonesian population. ASKESKIN performance in reaching its beneficiaries should be investigated more by using advanced tools to assess whether it has already reached the right poor people.

In this study, ASKESKIN has a positive effect on health care utilization especially in public outpatient and inpatient care. This showed that ASKESKIN program has already achieved its purpose which is increasing the health care utilization among the poor. Some anecdotal evidences showed that many ASKESKIN users were bypassing the system to get services in higher level of medical treatment. Government should improve the health care referral system to optimize the cost of health care services. The increasing number of health care utilization will affect the funds and infrastructures availability. For example, in term of inpatient care, ASKESKIN will lead increasing uses of inpatient care. Health care facilities should provide more third class inpatient care to guarantee health care services among the poor. ASKESKIN will be potentially high cost in some points. Related to government's plan to improve the ASKESKIN coverage for entire population, other mechanism (not free service based) probably can be introduced to the non poor uninsured population in order to achieve universal coverage in Indonesia.

To make better assessment of the program, further study can measure the effect of ASKESKIN program by evaluating the effect in term of health care expenditure or out of pocket payment among the poor people before and after implementation of ASKESKIN program. Other variable that can be added to measure the ASKESKIN achievement is health services quality perceived by ASKESKIN enrollees, this will complete the study about ASKESKIN, whether ASKESKIN also increased the quality of health care service among the poor in Indonesia. While the quality of the data in this study is quite high for a developing country, common data limitation remains. The data can not distinguish the single ASKESKIN enrollment, the question about insurance in the questionnaire is mixed between ASKESKIN program with previous health assistance program (health card and SKTM). The regression models do not control for differences in the quality of care receives by ASKESKIN enrollees. This study used logistic regression and OLS to investigate the ASKESKIN effect of health care utilization. Logit model has succeeded in estimating the health care utilization. OLS can provide satisfactory results in some model of positive number of health care utilization. Other models are recommended to estimate the non-zero model i.e. Poisson or Negative Binomial model.

Finally, research on financial implication of ASKESKIN program is needed to guarantee the program's sustainability. Continuous monitoring and evaluation of ASKESKIN program are required in line with the continuation of the program. The change of ASKESKIN program into JAMKESMAS in 2008 should be observed whether this management's change also affect the performance of the program in general.

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APPENDIX

DETAIL FOR MULTINOMIAL LOGIT REGRESSION RESULT

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Nominal Regression

Warnings

There are 8794 (66.7%) cells (i.e., dependent variable levels by subpopulations) with zero frequencies.

Case Processing Summary

		N	Marginal Percentage
cocf	1.00	931	21.2%
	2.00	675	15.4%
	3.00	2791	63.5%
sex	.00000	2227	50.6%
	1.00000	2170	49.4%
mar	.00	659	15.0%
	1.00	3738	85.0%
urb	.00000	3617	82.3%
	1.00000	780	17.7%
ins	.00000	3169	72.1%
	1.00000	1228	27.9%
time	.00	3665	83.4%
	1.00	732	16.6%
yins	.00000	2368	53.9%
	1.00000	2029	46.1%
Valid		4397	100.0%
Missing		1	
Total		4398	
Subpopulation		4397[a]	

a. The dependent variable has only one value observed in 4397 (100.0%) subpopulations.

Model Fitting Information

	Model Fitting Criteria	Likelihood Ratio Tests		
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	7957.601			
Final	7389.299	568.302	22	.000

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	8838.707	8770	.301
Deviance	7389.299	8770	1.000

Pseudo R-Square

Cox and Snell	.121
Nagelkerke	.145
McFadden	.071

Likelihood Ratio Tests

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	7389.299[a]	.000	0	.
age	7397.010	7.711	2	.021
dill	7419.407	30.108	2	.000
conpc	7417.214	27.915	2	.000
fams	7393.590	4.291	2	.117
ysch	7398.225	8.926	2	.012
sex	7411.667	22.368	2	.000
mar	7415.151	25.852	2	.000
urb	7403.290	13.991	2	.001
ins	7431.039	41.740	2	.000
time	7804.100	414.801	2	.000
yins	7421.561	32.262	2	.000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Classification

Observed	Predicted			
	1.00	2.00	3.00	Percent Correct
1.00	262	17	652	28.1%
2.00	154	19	502	2.8%
3.00	138	16	2637	94.5%
Overall Percentage	12.6%	1.2%	86.2%	66.4%

Parameter Estimates

cho1[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
1.00	Intercept	-1.281	.402	10.169	1	.001			
	age	.010	.004	6.382	1	.012	1.010	1.002	1.019
	dill	.023	.007	12.204	1	.000	1.023	1.010	1.037
	conpc	.000	.000	15.417	1	.000	1.000	1.000	1.000
	fams	.041	.022	3.398	1	.065	1.042	.997	1.088
	ysch	.029	.011	6.966	1	.008	1.029	1.007	1.051
	[sex=.00000]	.380	.082	21.536	1	.000	1.463	1.246	1.717
	[sex=1.00000]	0[b]	.	.	0	.	.	.	.
	[mar=.00]	-.360	.116	9.571	1	.002	.697	.555	.876
	[mar=1.00]	0[b]	.	.	0	.	.	.	.
	[urb=.00000]	-.313	.103	9.252	1	.002	.732	.598	.895
	[urb=1.00000]	0[b]	.	.	0	.	.	.	.
	[ins=.00000]	-.456	.087	27.741	1	.000	.634	.535	.751
	[ins=1.00000]	0[b]	.	.	0	.	.	.	.
	[time=.00]	-1.831	.102	324.424	1	.000	.160	.131	.196
	[time=1.00]	0[b]	.	.	0	.	.	.	.
	[yins=.00000]	.627	.130	23.230	1	.000	1.871	1.450	2.414
	[yins=1.00000]	0[b]	.	.	0	.	.	.	.
2.00	Intercept	-1.623	.453	12.825	1	.000			
	age	-.002	.005	.214	1	.643	.998	.989	1.007
	dill	.036	.007	27.466	1	.000	1.036	1.023	1.050
	conpc	.000	.000	18.794	1	.000	1.000	1.000	1.000
	fams	.036	.025	2.039	1	.153	1.036	.987	1.089
	ysch	-.008	.012	.431	1	.512	.992	.969	1.016
	[sex=.00000]	.043	.090	.223	1	.637	1.044	.874	1.246
	[sex=1.00000]	0[b]	.	.	0	.	.	.	.
	[mar=.00]	-.626	.142	19.504	1	.000	.535	.405	.706
	[mar=1.00]	0[b]	.	.	0	.	.	.	.
	[urb=.00000]	-.338	.114	8.816	1	.003	.713	.571	.892
	[urb=1.00000]	0[b]	.	.	0	.	.	.	.
	[ins=.00000]	.233	.106	4.808	1	.028	1.263	1.025	1.556
	[ins=1.00000]	0[b]	.	.	0	.	.	.	.
	[time=.00]	-1.625	.113	207.961	1	.000	.197	.158	.246
	[time=1.00]	0[b]	.	.	0	.	.	.	.
	[yins=.00000]	.602	.147	16.736	1	.000	1.826	1.368	2.436
	[yins=1.00000]	0[b]	.	.	0	.	.	.	.

a. The reference category is: 3.00.

b. This parameter is set to zero because it is redundant.

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