

FACTORS AFFECTING PARTICIPATION IN NATIONAL
HEALTH INSURANCE FUND AMONG THE ELDERLY HOUSEHOLDS IN
GEDARIF CITY, SUDAN

Mr. Elwaleed Ahmed Eltoum Abdelrahman



จุฬาลงกรณ์มหาวิทยาลัย

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ปัจจัยที่ส่งผลกระทบต่อการรายงานข่าวของผู้รับบำนาญในกองทุนประกันสุขภาพแห่งชาติ - ชูดาน
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นายเอลวาดีด อาห์เหม็ด เอลทัม อับเดลราห์มัน



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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วัตถุประสงค์หลักของการศึกษานี้เพื่อที่จะศึกษาถึงปัจจัยหลักที่มีผลต่อการเข้าร่วม
กองทุนประกันสุขภาพแห่งชาติในกลุ่มครอบครัวผู้สูงอายุ ในเมืองกาเดารีฟทางตะวันออกเฉียง
ประเทศซูดาน เนื่องจากกลุ่มครอบครัวผู้สูงอายุต้องประสบปัญหาของค่าใช้จ่ายทางการแพทย์ที่สูง
และไม่แน่นอนโดยไม่มีระบบประกันสุขภาพ อีกทั้งยังมีรายได้ที่จำกัด ไม่เพียงพอต่อค่าใช้จ่ายทาง
สุขภาพที่สูงขึ้น การศึกษานี้เป็นการศึกษาวิเคราะห์โดยเชิงปริมาณเพื่อหาปัจจัยหลักที่มีผลต่อการ
เข้าร่วมของกลุ่มครอบครัวผู้สูงอายุ ในเมืองกาเดารีฟ นอกจากนี้ยังวิเคราะห์ถึงตัวแปรทางสังคม
วัฒนธรรม และการเมืองที่มีผลต่อกลุ่มครอบครัวผู้สูงอายุในการเข้าร่วมกองทุน โดยรวบรวมข้อมูล
ปฐมภูมิจากประชาชน 600 คนและนำมาวิเคราะห์โดยการวิเคราะห์ความถดถอยโลจิสติกพหุกลุ่ม
จากผลการศึกษาพบว่าการมีความรู้เกี่ยวกับกองทุนประกันสุขภาพแห่งชาติ ระดับการศึกษา การ
เข้าถึงการบริการทางด้านสุขภาพ ความพึงพอใจต่อผู้ให้บริการ การมีปฏิสัมพันธ์ระหว่างสังคม การ
ได้รับข้อมูลที่ดี และสถานะทางสุขภาพเป็นปัจจัยหลักที่มีผลต่อการเข้าร่วมกองทุน การศึกษานี้
สรุปว่ากองทุนประกันสุขภาพแห่งชาติควรมีการจัดกิจกรรมส่งเสริมและให้ความรู้อย่างสม่ำเสมอ
เพื่อที่จะเพิ่มความรู้และการเข้าร่วมในกลุ่มครอบครัวผู้สูงอายุที่เป็นกลุ่มเป้าหมาย รวมถึงควรเพิ่ม
การเข้าถึงการบริการทางด้านสุขภาพ โดยเฉพาะในพื้นที่รอบนอกและเพิ่มคุณภาพการให้บริการ
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The reason for conducting this study is to identify the main factors that influence the participation of elderly households in the National Health Insurance Fund in Gedarif City, Eastern Sudan. Without health insurance, elderly households face large and uncertain medical expenditure. At the same time, they have limited resources to meet increasing health care costs.

The study uses quantitative methods to explore the main factors affecting NHIF participation among elderly households in Gedarif City. Primary data from 600 respondents were collected in 2015 and analyzed using binary logistic and multinomial logistic regressions. The results show that knowledge about National Health Insurance Fund, education, accessibility of health services, satisfaction with providers services, social interactivity among the society, exposure to advocacy information, and health status have a significant impact on enrolment. The study concludes that the National Health Insurance Fund has to set and conduct regular promotional activities to improve the target group's knowledge, increase accessibility to health care services (especially in the peripheral area of Gedarif City, and improve the quality of health care services.

Field of Study: Health Economics and Student's Signature

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LIST OF ABBREVIATIONS:

FMOF	Federal Ministry of Health
GDP	Gross Domestic Product
NHIF	National Health Insurance Fund
NPF	National Pensions Fund
NSSF	National Social Security Fund
SMOH	Sudan ministry of health
IC	international community
CBS	Central Bureau of statistics

CHAPTER 1

INTRODUCTION

1.1. Introduction

Globally, it was estimated that the proportion of the elder population will be double from 9% up to 16% within the coming three decades. Moreover, about 80% of those elderly will be concentrated in the developing countries especially in Africa which face very rapid conversion into aging society (Schwarz & Demirguc-Kunt, 1999).

With no acceptable definition for elderly, the definition has remained ambiguous. For example, western countries consider the age of elderly people start from 65+ year, while African concepts consider age of elderly begin when people receive the pensions whereas the definition of United Nations agreed cut-off 60+ year (H.Rfaculty, Work, & Gulbarga, 2014). In terms of definition the elderly households is defined as a households in which the households head or his/her spouse is age 60 years old or over. (Barry L. Steffen & Keith Fudge, 2011)

In contrast, systems providing financial and health security for the old people facing pressure throughout the world, this is due to the rapid increase of elderly all over the world, in addition to their need to continuous health care with uncertain health care expenditure especially in the absence of health insurance coverage (Jonathan Gruber 1993).

Therefore, developing countries are certainly planning to introduce health insurance, as an important option to achieve more accessibility for health services and provide financial protection for both population and health system. Basically, solidarity is the main principles of health insurance which promotes the collection and distribution of members contribution in term of health care services.(Carrin, 2000c).

Sudan is one of the developing countries in Africa that implement the public health Insurance. This system undergone several stages of development, from social security scheme for the civil servants to National Health Insurance Fund that act to cover the whole population under the concept of universal health care coverage (NHIF, 2012).

In 2004, Sudanese National Health Insurance Fund, managed special health insurance system to insure public sector and pensioners. The scheme targets all pensioners whether they enroll under national pensioners fund or under social security fund. (SSA & ISSA, 2011) .

Although of the exerted effort to cover all the citizens under the umbrella of National Health Insurance Fund, but, still there are low continuation enrollment of elderly people in Sudan. Thus, there is a big debate about factors affecting the continuation of elderly to enroll in NHIF.

Because elderly in general become ill more frequently than younger people, incidence and prevalence rates of illness increase rapidly in the elderly people and this bring challenges.

Therefore, policy Makers want to know how to encourage the protection of elderly under health insurance scheme.

So, this study try to address this problem by focusing on the factors affecting the enrollment of elderly household which consider under the socioeconomic factors, demographic factors and health status of the elderly people .

1.2. Current health situation in Sudan

Sudan like other developing countries, suffered from many problems like standing long civil war in south Sudan before has been separated in the year 2011. This resulted to loss of petroleum revenue. Moreover, the continuous conflict in Darfur region in the west makes the situation darker. The result of these conflict create very obvious governmental budget deficit, therefore growing burden of diseases and demand of services were increased and this lead to high out of pocket spending and barriers accessibility of health care services(NHA, 2008).

Sudan ranked 53 out of 88 developing countries in term of human poverty index. 46.5 of the population were under poverty line. Therefore, National Health Insurance Fund was introduced to support national policy and help federal ministry of health(FMOH) to increase the associability of health services and provide social protection to Sudanese population under universal health care coverage.

National Health Insurance Fund right now successes to achieve high percentage of coverage for the formal sector and the continuation efforts to cover poor family by Zakat fund and federal ministry of finance FMOF, whereas there are other sectors

remain one of the challenges faced National Health Insurance Fund like informal sector.

1.3. The rationale for conducting this study

The main reason for conducting this research is the challenges that face the National Health Insurance Fund in Gedarif state in expanding the coverage among elderly people in the state.

Although of the different initiatives and continuous efforts but elderly still covered partially therefore, the aims of this study is to support all the efforts which trying to covered the rest of elderly people by providing evidence based result of behavior analysis of the target population and investigate different perception which affected decisions to enroll in national insurance fund.

1.4. Problem and significance

The problem of this thesis is associated with the elderly household in Gedarif state Eastern Sudan because elderly household face large and uncertain medical expenditure without guarantee of public insurance coverage. Although this sector is very small compared to other sectors in Sudan, but the continuation of coverage still represent major challenge for National Health Insurance Fund National Health Insurance Fund. Because elderly people face more risk, chronic illness and the same time have more limited resources.

Therefore, Social protection is a right, and an affordable one. It is also a powerful instrument for poverty reduction and social cohesion.

Although the population coverage in Sudan is family-based and the elderly are considered one of the priorities for enrollment, the National Health Insurance Fund has no documented accurate figures within its records to explain why elderly were not fully covered under its umbrella, except those obtained from their direct scheme reports in NPF and NSSF. However, there are other possibilities for elderly to participate in other NHIF schemes. The elderly may be covered either through the poor family coverage provided by AL zakat charity and Ministry of Finance supportive scheme, the voluntary scheme or as beneficiaries of a family member since parents can be covered through their children. Although all this efforts to expand the coverage of elderly people in NHIF but still the enrollment of this group is very low.

According to Sudan national health account, health care cost is increasing rapidly due to the increase of inflation rate. moreover the unstable situation of economy and high out of pocket spending that reached up to 64.3% of total health spending which resulted in large proportion of the community, cannot access to health care services (NHA, 2008) . In 2009, the Central Bureau of Statistics (CBS) revealed that the poverty line was 113.8 SDG per person per month and that 46.5% of the population of Sudan fell below this poverty line, with 26.5% of the urban population and 57.6% of the rural population falling below this poverty line.

Therefore, elderly are consider the most sector that need financial protection due to low pensions in Sudan which does not exceed 80US\$ per month. This was a major reason for their poverty and poor living conditions. Also older people likely to suffer from chronic health protection for this sector.

1.5. Research question

What are the main factors that affect the participation of elderly households in the health insurance schemes of the National Health Insurance Fund in Gedarif City -Eastern Sudan?

1.6. Study objectives

1.6.1. General objective

To identify the main factors that influence the elderly households to participate in the health insurance schemes of the National Health Insurance Fund in Gedarif City Eastern Sudan.

1.6.2 Specific objectives

To explain the main factors that lead elderly households to participate in NHIF through NPF, NSSF, Social Subsidies Fund and voluntary scheme.

To examine how insurance knowledge relates to NHIF participation of elderly households

To investigate the effect of socio-cultural and political factors on NHIF participation of elderly households

1.7. Study scope

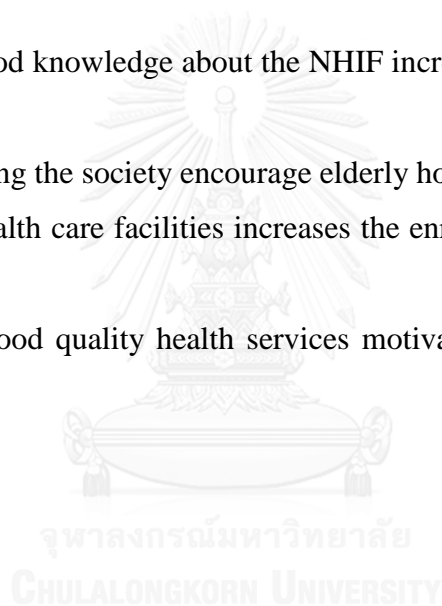
This study was conducted in Gedarif State in 2015. The target population is the head of elderly households in the urban areas of Gedarif City, 600 respondents of insured and never insured.

Although Gedarif state has 12 localities, Gedarif City was chosen due to existence of different schemes. The other localities either lack NPF and NSSF members or these are difficult to access due to time and budget constraint

1.8. The Study Hypotheses

The hypotheses are as follows:

- 1-The presence of good knowledge about the NHIF increases the enrolment of elderly households in NHIF.
- 2- Social culture among the society encourage elderly households to enroll in NHIF
- 3-The presence of health care facilities increases the enrolment of elderly households in NHIF.
- 4-The provision of good quality health services motivates the enrollment of elderly households in NHIF.



CHAPTER 2

BACK GROUND

2.1. General background

Sudan is one of the eastern African countries with land area about 1.8 million square kilometers. Its population nearly 34 million people with 33.3% out of population live in urban area ,whereas the rest of population live in rural area, Its neighbors are Chad and central African republic on the west ,Egypt and Libya on the north , Ethiopia and Eretria on the east . South Sudan, Kenya, Uganda, and Congo on the south. ("World Statistics Pocketbook," 2013).

The national economic indicators decline worst level since 2009 after the secession of south Sudan, which resulted in an 80% reduce in foreign currency and 35% reduction in budget revenue (NHIF, 2013b). Furthermore, 46.5% of Sudanese population is lives below the poverty line. due to persistent civil war in Darfur and south kordofan.(NHA, 2008).

Table 2-1. Differences Economic Indicators between Sudan, Ethiopia and Egypt 2014

Indicators in	Ethiopia	Sudan	Egypt
Gross domestic product (GDP)in billion	49.86	70.03	284.860
Gross domestic product per capita	547.981	1985.2	3.336.6
Gross domestic product ,deflator (index)	165.728	413.6	318.973
GDP gross (annual %)	0.130	0.149	0.884
Gross national saving (% of GDP)	23.189	11.5	14.036
Unemployment rate (% of total labor force)	-	13.3	13.4
Current account balance (percent of GDP)	7.088	-4.4	-0.441

Source: international monetary fund, 2014

2.2. Social security system in Sudan

Social security is a continuous challenge for many countries worldwide. During the past three decades, Sudan has suffered from a series transformation in its economic and social topography. These have greatly impacted on most social security interventions across the country. Despite these challenges, Sudan has made some significant steps towards stabilizing the social security status and has grown steadily over the past few years.

The first law for social security system in Sudan was publishing in 1974, whereas this law has been reformed in the year 1990 to meet the challenges which faced the economy in last decade.

The coverage of this system include employed and self-employed persons in contrast this system excluded Household workers, family labor, home-based workers, farmers and foresters, and unpaid apprentices. Special systems for civil servants and police and armed forces personnel.

The source of funds comes from deduct 8% of gross monthly earnings. Also Contributions for work periods in uncovered employment may be paid retroactively by the insured person, whereas the employer paid 17% of gross monthly payroll. Self-employee person paid 25% of declared monthly income. The government doesn't have any contribution to support the system of social insurance system in Sudan.

The benefits which grant to the employee after retired in case of dead or old-age is equivalent at minimum 40% of the insured's average monthly earnings in the last three years before Retirement. And maximum 80% of the insured's average monthly earnings in the last three years before retirement. Early pension: The pension is reduced by 15% if the insured is aged 50 to 54 or by 10% if aged 55 to 59.

A health insurance benefit has been provided by National Health Insurance Fund only(SSA & ISSA, 2011).

2.3. National health system of Sudan

Sudan has 16 State Ministries of Health (SMOH), one in each State. The Federal Ministry of Health SMOH is responsible for the development of national health policies, strategic plans, monitoring and evaluation of health systems activities. The (SMOH), are mainly responsible for policy implementation, the implementation of the

national health policy is undertaken through the district health system based on the primary health care concept. Health services are provided through different partners including in addition to federal & state ministries of health, armed forces, universities, private sector (both for profit and not for profit) and civil society. However, those partners are performing in isolation due to ill-defined managerial systems for coordination and guidance. The Adoption of the decentralized system in Sudan was faced with many problems arising from the abrupt implementation without prior effective training programmers.

2.3.1. Health service delivery in Sudan

Health care delivery is an important component of the health system and the National Health Policy to ensure the provision of health services. This organized in three levels: primary to provide health care services for primary and basic health care, secondary level for hospitalization and medical consultation services and tertiary level which provided sophisticated health services.

In general the public health sector remains the main provider of the health care services; whereas the percentages of private sector still remain is limited existed only in the capital and some few states.(NHA, 2008).

Health care services delivery in Sudan faced many challenges and obstacles during the implementation of the federal system and causes different types of problems that can be summarized as: rare of patient transportation and ambulance, insufficient budget, Weak infrastructure and distribution, Absence of referral systems, Lack of work standards(FMOH, 2007). Overall, there are many difficulties and problems to facilitate the accessibility of health care services in Sudan especially in the rural area. According to report of national health account one fifth of the population has no access to health facilities and half of the health facilities have minimum requirement like equipment's, medical staff functional infrastructure.

2.3.2. Health finance in Sudan

Health care finance in Sudan has some different public and private source which consist of federal ministry of finance, National Health Insurance Fund. Armed force and very small private insurance. But according to the NHA 2008 the main source of the system depend on household health expenditure the result show that almost 64% of the total fund, whereas 29% contribution from public fund,4% from national donors

and 3% from other private sectors . (NHA, 2008). Also the report illustrate the total number of national health expenditure in Sudan amounted 7.1 billion SDG, (USD3.3 billion) with per capita SDG232 (USD 111).which represent about 5.6% as share of GDP. Table below shows different financing source of national health system.

Table 2-2. Different Financing Source of National Health System

Source		Amount SDG	percent	Per capita
Public source	Federal ministry of finance	734,642,519	10.3%	23.93
	SMOF	1,029,147,641	14.4%	33.52
	localities	92,364,552	1.3%	3.01
	Parasternal funds	51,369,882	0.7%	1.67
	Zakat Chamber	150,633,828	2.1%	4.91
Private Sources	Employer Funds	168,846,947	2.4%	5.50
	National NGOs	7,720,495	0.1%	0.25
	Community Finance	2,231,655	0.0%	0.07
	Household funds (FS.2.2)	4,583,326,532	64.3%	149.30
	Other Private funds	11,816,539	0.2%	0.38
IC	Donors	296,860,914	4.2%	9.67
Total SDG		7,128,961,504	100%	232.22
Total USD		3,394,743,573		USD 110.58

Source: National Health Account –Sudan2008

2.4. National health insurance in Sudan

The National Health Insurance Fund act of 1995 which is consider a national institution based on solidarity that is concerned with providing curative care improve the quality of health care ,participating in poverty reduction and facilitated to access

health care services to insure beneficiaries satisfaction. The vision of National Health Insurance Fund is to achieve the universal health coverage among Sudanese population. The unit of the enrollment in system based-on the family regardless the size of the family members and the different way of payment. The National Health Insurance Fund is decentralization system administrated through head quarter in the center and executive departments at the state level. Health insurance is mandatory through the national system for all governmental or public and private sectors. At the end of 2013 about 10.8 million citizens enrolled in the NHIF, which represent about 30% of the target population .(NHIF, 2013a).

Table 2-3. Main Feature of the Different Sectors in the NHIF

Sector	Target	payer
Public	10% of the salary	6% from employer and 4% from employee
Private	10% of the salary	6% from employer and 4% from employee
Pensioners public sector	Flat rate	100% ministry of finance
Pensioners private sector	Flat rate	100% national social security fund
Informal sector	Flat rate	100% the household
Students	Flat rate	100% ministry of finance and Zakat chamber

Source: (NHIF report 2012).

2.4.1. The benefits package of National Health Insurance Fund

The benefit package provided by nation health insurance fund basically concentrates on curative services. It's covered all level of services, primary, secondary and tertiary and there is referral system to connect between different levels and between the states. The system also gradually expands to cover all the medical services according to the priorities and needs to achieve the accessibility and equity and continue

to develop the health care services.(SAH 2014) . The main services that covered under National Health Insurance Fund are: outpatient services, in patient services, laboratory investigation, diagnostic procedure like X-ray, ultrasound, endoscopy, CT scan and MRI. All the surgical operations except cardiac surgery and plastic surgery. Most of drugs are included; the insured has to pay 25% of the drug cost as co-payment.

2.4.2. The finance of National Health Insurance Fund

According to NHA National Health Insurance Fund represent 2.6% of the total health expenditure, the main source of funds include premium from formal sector members 88%, 6% was contributed by AL zakat 4% by other private fund. government support for the salaries and socially supported members and revenue from cost sharing on medicine (NHA, 2008).

Table 2-4. Sources of NHIF Funds

Sources of National Health Insurance	TOTAL SDG	Share
Federal & state Ministry of Finance	160,923,393	87.6%
Al-Zakat	11,993,474	6.5%
Parasternal Employer Funds	799,565	0.4%
Private Employers Funds	999,456	0.5%
Household Funds	1,199,347	0.7%
other private funds	7,855,725	4.3%
TOTAL	183,770,960	100%

Source: NHA 2008

2.4.3. Payment mechanism from provider perspective in NHIF

Provider payment mechanism has been defined as a way to transmit fund from payers to providers it has a wide ranging effects and incentives on all perspective and many aspects including in the health system such as accessibility to the health care services, provider satisfaction, patient satisfaction, quality of health care, and the cost of health care services as well as the volume of health services. In National Health Insurance Fund –Sudan we have two types of payment mechanism implemented in term of provider prospective:

Fee for service

Fee for service is oldest type of payment mechanism has been used in NHIF to compensate the providers for every services offered to the clients, so as to increase the

revenue of the provider, therefore the provider tend to over utilizing health services event the patient not in need.

Salary

Salaries is the second type of payment mechanism in NHIF the National Health Insurance Fund ,which offered his health services through direct method , where national health insurance owned its health facilities .So, National Health Insurance Fund offers for his staff who works in health care facilities, fixed amount of money monthly as salaries and financing all services related to the health facility, like water , electricity and so on.

2.5 Social protection in Sudan

Health Insurance Fund is a social organization seeks to achieve the universal health coverage on bases of solidarity and social security. Family is a unit of enrolment under the umbrella of this health insurance scheme. Elderly people represent one of the main coverage targeted groups, they considered a vulnerable group and have large probability of getting chronic diseases, which most likely impoverish them. In terms of health insurance condition of elderly households, they are classified in five groups:

1. National Pensioners Fund members, they are covered by health insurance and their premiums paid from Federal Ministry of Finance. They were a civil servants before retirement. Their families characterized by small sizes.
2. National Social Security Fund members, those who covered are sponsored by their institution directly. Most of them were private sectors employees. Thus they are mainly urban dwellers. Some of them had been working in autonomous financing public organizations. Their families characterized by small sizes.

Poor families heads, they are not afford to pay the health insurance premiums, hence the social security funds finance their premiums (fee waivers). They are two groups:

3. Fee waivers through Zakat Chamber, Their families characterized by relatively large sizes.
4. Fee waivers through Federal Ministry of Finance, Their families characterized by relatively large family size.
5. Self-employed households, their participation in health insurance is matter of premium payment from their own pockets. Some of them have willing to opt in health insurance and have ability to pay the premiums, fore that they participated in

health insurance. They represent modest percentage of this group. On the other hand the majority of them either have no willing to enroll in health insurance, have no ability to pay the health insurance contributions, or both.

2.6. Gedarif State

Gedarif state is one of the 18 states of Sudan located in eastern region, it has an area of 75263 Km square, share an international border with Ethiopia to the East. Nationally, the state is bordered by kassala and Khartoum state to the north and ELgezira state to west and Sennar state to the south. The state made up with 12 localities and has total population about 1,728,171 and 329561 households with annual growth rate about 3.87%. The table below shows the total number of Gedarif state population.

Table 2-5. Total Numbers of Population in Gedarif State

locality	Total population	Total household In each locality	Weight of each locality
Al Gedaref City	365071	91267	28%
Al Butana	96292	16084	5%
Central Al Gedaref	151291	25215	8%
Al Faw	239361	36824	10%
Al Rahad	183818	28280	9%
Qalaa Al Nahal	89532	14922	5%
Western Galabat	124431	20738	6%
Al Goreisha	112920	18820	6%
Eastern Galabat	153666	25611	8%
Al Fashaga	163715	27286	8%
Basonda	64682	10780	3%
Elmafazah	82406	13734	4%
Total	1,827,181	329561	100%

Source: Gedaref NHIF statistic report 2014

2.6.1. Health indicators of Gedarif state

Health infrastructures differ from one locality to the other, due to the density of population. In general the total numbers of hospital are 28 while there are 56 health Centers and 13 basic health care units. National health insurance in

Gedarif state provided services through two channels, direct provision through health Centers own by NHIF or purchasing services from Ministry of health. The table below show the health indicator in Gedarif State.

Table 2-6. Health Indicator in Gedarif State

Indicators	Gedarif state measurement	Average in Sudan
Neonatal mortality rate (per 1000 live births)	43	37.3
Post-neonatal mortality rate (per 1000 live births)	43	34.7
Infant mortality rate (per 1000 live births)	86	71.2
Child mortality rate (per 1000 live births)	55	37.3
Under-5 mortality rate (per 1000 live births)	137	105.8
Underweight prevalence (% below -2 SD and -3 SD)	33.8 and 8.7	31.9 and 9.4
Stunting prevalence (% below -2 SD and -3 SD)	38.4 and 16.8	32.9 and 15.1
Wasting prevalence (% below -2 SD and -3 SD)	9.8 and 1.7	13.9 and 3.2
Children who received all vaccinations (DPT1-3, OPV-1-3, BCG and measles)	50.8%	50.3%
Houses with at least one mosquito net	43%	38.5%
Use of improved source of drinking water	37.3%	55.1%
Population using sanitary mean of excreta disposal	14.6%	38.0%
Using improved sources of water and sanitary means of excreta disposal	9.6%	27.7%

2.6.2. National Health Insurance Fund and health facilities in Gedarif state

Gedarif executive directorate is one of 18 directorates in Sudan that act to implement the national policy of NHIF. The directorate was established in October 1997 to ensure the whole population in the state. By the end of 2014, about 700451 citizens are covered by NHIF in Gedarif executive directorate which represents about 38.3% of target population of the state.

Table 2-7. Distribution of Health Services That Provide Health Insurance Localities

Locality	Hospital	Health centers	Community clinic	Specialist clinic	Total
Al Gedaref City	8	22	6	19	55
Al Butana	1	-	-	-	1
C. Gedarif	1	5	2	-	8
Al Faw	2	6	2	-	10
Al Rahad	3	2	-	-	5
Qalaa Al Nahal	2	2	-	-	4
W. Galabat	2	6	1	-	9
Al Goreisha	3	1	-	-	4
E. Galabat	1	7	1	-	9
Al Fashaga	1	3	-	1	5
Basonda	1	1	-	-	2
Elmafazah	3	1	1	-	5
Total	28	56	13	20	117

Source: NHIF statistics report 2014

2.6.3. Elderly in Gedarif state

According to Sudan Central Bureau of statistics (CBS) the number of elderly people in Gedarif 60 years and over about 105842 individual represent about 5.8% from the total number of population 2014.

Table 2-8. Total Number of Elderly in Gedarif State

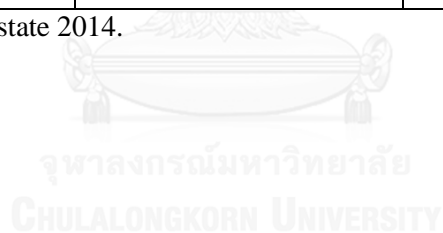
60-64	65-69	70-74	75-79	80+	total
30246	23781	18373	14021	19421	105842

Source: Sudan Central Bureau of statistics

Table 2-9. Distribution of Elderly in Each Locality

locality	TOTAL ELDERLY	Weight of each locality
Gedaref City	29636	28%
Al Butana	5292	5%
Central Gedarif	8467	8%
Al Faw	10584	10%
Al Rahad	9526	9%
Qalaa Al Nahal	5292	5%
W. Galabat	6351	6%
Al Goreisha	6351	6%
E. Galabat	8467	8%
Al Fashaga	8467	8%
Basonda	3175	3%
Elmafazah	4234	4%
total	105842	100%

Source: NHIF Gedarif state 2014.



CHAPTER 3

LITERATURE REVIEW

3.1. Social Health Insurance System

Social health insurance can be defined as a form of health protection coverage which is usually provided by governments to its citizens for utilization in the event of illness. Additionally, health insurance can be provided by other non-governmental organization and agencies which could be both private, for profit and/or not for profit making missions.(Acharya A, 2011).

The concept of health insurance is based on sharing the health risk and the contribution which comes from society throughout the income whereas government financed the system from the general tax.

Moreover, the main objectives of health insurance is implementation of health universal coverage so as to increase the accessibility of health care services and health care utilization regardless of income or social status (Carrin, 2000c).

Also the concept of health insurance try to pools both the health risks and contributions among their members, initiatives, households and government. (Carrin, 2000a)

Furthermore, the aim of health insurance is financial protection for the people who already suffered from shocks to cover their health care cost whether this cost involve some tax financing subsidies or direct payment which keep the premium below the actuarial cost which allow the poor family can or must en mechanism under the cost of package or even free. This type of insurance scheme may be seen as extension insurance health and most likely manage at the community level either through non-governmental body (NGO) or local government. This often called community health insurance. (Arnab Acharya, 2012)

In general social health insurance theory based on risk averse of status persons which identify their needs to enroll whether he or she do not know they will be sick or not, so people would like to pay the premium of health insurance instead of being under the risk of high out –of pocket health expense when they got sick and they have no health insurance. (Acharya A, 2011)

To achieve successful and sustainable health insurance coverage, we have to choose appropriate policy for implement comprehensive programs which enhance the majority

of population to enroll in health insurance if finance solidarity is not so hard. Another situation may arise the coverage when the services are available ,sustainable and affordable for all persons.(Carrin, 2000c).

3.2. Impact of socio –economic, socio cultural and political factors

Social economics status play major roll to determine the enrollment in Health insurance, study conducted in china in 2005 to measure the Net benefits as different between the value of services provided and Amount of premium and co-payment that the persons pays as out of pocket so as to examine the decision of enrollment in community Base health insurance. Study used logistic regression model to investigate the probability of participation and to explore how related Factors like income, health status, health care utilization and health Expenditure per visit. The variables used in this study described as Follow:

In terms of income was classified into three level, high income, medium income and low income whereas the health status of households divided into poor health status, medium health status and good health status.

Health expenditure estimated as an annual figure whereas utilization of the services measured as monthly per visit.

The result of this study come up with low income farmer and good health status are less likely to enroll in health insurance compare with farmer has high and medium income or poor health status.

Additionally, the study investigate high income farmers are more utilized outpatient service than low income farmers ,in contrast poor health farmers are more likely use inpatient services like hospital admission .

In term of health care expenditure study found that the participants with good health status are lower health care expenditure than the poor farmer's health status.

Some studies found that purchasing health insurance is associated with the level of income of household. Therefore households which have lower income are least likely able to pay health insurance premium, whereas the aim of insurance health system is to protect the poor family from catastrophic health expenditure(Bhat & Jain, 2006) .

Studies conducted in Ghana in 2011 aims to Identify and compare the perceptions of insured and uninsured household in country in term of health care providers, service

delivery health insurance. Moreover, it was trying to find out the relationship of these perceptions with household decisions to voluntarily enroll and remain in insurance schemes.

The study analyzed 3301 household and 13865 individuals to evaluate respondent's perceptions. All respondents had same awareness of national health insurance system; regardless of their insurance status whereas the majority knows that insurance health as prepayment for health care. 76% enroll in NHIS, whereas 16% drop out from the scheme. The reasons for not continuation according to unaffordability of pay the premium. 6% were not satisfied with the services of health insurance 8% said that they had not used the services in the last year. The result of this study come up with socioeconomic status has strong effect in the mechanism of enrollment in NHIS (Jehu-Appiah, Aryeetey, Agyepong, Spaan, & Baltussen, 2012). Study done by (Parmar et al., 2014) in Ghana and Senegal used Cross-sectional household survey conducted using logistic regression model to study determinants of enrollment of elderly people. The result of this study include socioeconomics and socio cultural factors. The results of sociocultural exclusion provide the importance of social support and solidarity in influencing enrolment forms in both scheme. For example the increase the principle of social solidarity would increase the enrollment .the solidarity also offered the respect to the older people and having positive perceptions on the respect afforded to older enrolling. But the exclusion appeared when older people needs to obtain an ID card which required to presenting birth certification or taking three witness to confirm their nationality . These requirements may be difficult for some persons to obtain ID card and it is considered isolated in poor health or persons living in rural area. The study also used the concept of political factors as determinant of social exclusion because some people may not have access to the basic needs of living so as to participating with society due to the unavailability of resources or due to the barriers which prevent them to accessing available resources like health care facilities, save housing and easy to access information which include in Ghana information about clinics run by missions and NGOs. Which offered free health care to enroll, in contrast the persons should participating in the recent elections and being member of a political party.

The result show that Political factor play major role to determine the enrollment of elderly people in NHIS Plan Sesame in Ghana and Senegal respectively .For instance

older people who has activities in civil society and participating in political activities like voting were more likely to enroll. In term of the socioeconomic factors the study show that all unaffordable household were in the first and second socio-economic quintiles with more than half of unfolders lived in urban area. In-contrast high proportion of un- insured household lived in rural area also most of them were male house hold heads. The result further show that the partially insured household had large household size, highest number of children and elderly people. Females were more likely than males to insure also Household members whose health status was perceived to be fair or poor were more likely to be insured.

Lastly, the reasons of un-insured in NHIS, 64% of un- insured and 47% of partially insured mentioned that their members were not insured in NHIS because they were believed that the premium was very expensive while 22% of un-insured and 37% of insured partially mentioned that their member un-insured because they were not fall sick, whereas the rest of household mentioned other reasons like lack of poor quality of health services, registration is difficult, lack of trust in NHIS officers, un adequate of benefits package. Other Study conducted in Ghana by (Anthony Kusi1, 2015) in the year 2015 used cross-sectional household survey in three districts and structured house hold questionnaire was administrated to the household head in a face-to-face interview by ten trained field assistants. The questionnaire include socio economic characteristics, health status (illness during last six month and presence of chronic illness) and health insurance status across insured and non-insured and non-renewal household, moreover the questionnaire include the possibility of access healthcare and household dwelling, assets ownership.

In addition, the data include annual household consumption expenditure consist of food and non-food needs like health care and housing. The study come up with 28% of household were fully insured 26% were partially insured whereas the rest of households were uninsured household. Study also investigate that the fully insured household were older and had high numbers of household members with at least secondary education level and had more formal sector workers. On the other hand the partially insured household had high numbers of children, and elderly people. While the uninsured household had fewer numbers of elderly and fewer number of formal workers.

The rest of household mentioned other reasons like lack of poor quality of health services, registration is difficult, lack of trust in NHIS officers, inadequate benefits package.

Moreover, study conducted by (Babajanian, 2012) Asian region the important finding of this study the social pensioners have been beneficial to improve the older people welfare, in contrast there are some knowledge gaps that need to address in the future.

For example the existing contributory provides income support only to the small number of population, whereas most of this supports went to the large formal and informal sector in the urban area, meanwhile the majority of older people in region rely on their families support and informal relationship for social protection. Moreover contribute toward insurance during their life work; only provide low retirement to the pensioners. This problem also existed in Africa and Latin America as well.

Secondly, the study also tries to address the basic need associated with healthcare expenditure of old persons, for instance in Viet Nam, the cost of health care represent high burden for older people, even though there were high proportion of older people covered by health insurance. Also study run in Asian region in four countries, Mongolia, Sri Lanka, Thailand and Viet Nam conformations a relationship between ageing and poverty .this evidence is very important so as to assess the actual numbers of older people in the region and try to address the poverty among older people through social pensioners.

There is strong evidence that shows substantial reduction in poverty through the delivery of social pensioners.

In contrast, still the coverage of old pensioners was very small, the findings also show that older people feel they are more liable to poverty as they age as result of changing in socio-economics environment. (Mujahid, Pannirselvam, & Doge, 2008).

3.3. The impact of health status factors

Providing protection and affordable health care in most developing countries represent the main challenges for their governments, which suffer from unsustainable health care system because of market failure.

This problem is associated with two major components; the first approach is the standard economic theory which focuses on the role of price, whereas the society

focuses on redistribution of low- income or sick population or address issues such as affordability and expanding the coverage. The second approach is information asymmetry of determining coverage like moral hazard or adverse selection. (Katherine Baicker, 2012)

Adverse selection in which individual who were less healthy join in health insurance whereas the healthier people cannot allow to enroll this will lead to increase the premium and decrease the market too, and extreme case to the collapse of the market. Adverse selection also had another problem in which the insurance company tries to insure the less risk people so as to maximize profits. And try to discourage less risk from purchasing insurance health.

Moral hazard take place when individual start to consume un-necessary services when he or she insured than if he or she were not insured, this behavior will lead to increase the cost of health services. Other problems occur when the provider trying to induce demand when they are request un-necessary services to the patient.

Adverse selection is one of the very serious problems associated with the insurance health market especially voluntary health care market. This problem appear when the high risk person having more knowledge about his health status than the insurer this problem has very serious impact on the financial sustainability when the members of high risk is very big this will indicate that the premium cannot covered the cost of health expenditure.(b. Werner Neudeck a, * Konrad Podczech b, 1996)

Many literature reviews try to investigate the impact of adverse selection towards insurance health coverage. Whether in the developed and developing countries, as an important issue in recent years, because insurers have much incentive to attract heather insured and try to avoid sick insured, therefore the insurer try to avoid high cost of health insurance expense.

Many countries try to address this problem, for example study done by (Werner Neudeck a, 1996)try to solve this problem through offer compulsory insurance health and full coverage for all population and charge all individual same premium to redistribute the high risk among the members.

Other countries allow to their individuals to remove from public insurance if can pay private insurance instead. Some countries introduce and signing contracts with private health care company to offer this contracts and to accept all application for it.

Study done by (Anthony Kusi, 2015) shows that insured households who had high illness and high proportion of chronic illness most likely to be insured, 83% with chronic illness condition

Were insured compare with 51% of those without chronic illness. 37% of insured partially mentioned that their member un-insured because they were not fall sick.

study conducted in china in 2005 to measure the net benefits as different between medical package provided by health insurance and amount of premium paid the study revealed that farmers with good health status are less likely to participate in NHIS compare with other farmers with medium or poor health status (Bhat & Jain, 2006).

Other Study was conducted in Jomaa Town in Ethiopia, used simple and multiple logistic regression was done to find the independent predictors of demand for health insurance. The study found that the respondents prefer to visit private clinics more than government hospital and health care centers in term of quality of services. 16.5% households in this study at least they have one person had chronic illness so presence of chronic illness in the family increased the demand of health. The chronic illness in the study include (diabetes mellitus, hypertension, heart diseases, tuberculosis, asthma, renal problems, bone problems (Fentahun, 2014).)

3.4 The impact of demographic factors

The impact of socio- demographic factors influence the participation of house hold of enroll in Health insurance scheme, study conducted In the Fengshan Township, China 2006 used Socio –demographic factors to measured health services utilization which include age, gender, marital status, level of education and the distance of health facilities from the residence of respondents.

The study found that age has positive impact to join health insurance scheme, also the study revealed that distance from nearest health facilities played major role for enrolment in the scheme, so the farmer who are nearby the health care facilities might be more likely to participate in health insurance than those who live far away from health care facilities. (Zhang, Wang, Wang, & Hsiao, 2006)

Study done by Anderson, (1973) investigate that education is very important factors which has positive impact on the household members in the national health insurance scheme. So, It has been found to be related to health care utilization this finding indicate

that better educational level of population increase the awareness of health care utilizing regularly and most likely the households to be enroll in health insurance scheme, for instance income and education increase markedly when the person has better education also the health care facilities exist in the area where the majority of population is better educated like hospital and health care center.

Also study found age has strong relationship with health care utilization hospital admission rate in average lowest in the children compare with persons 55 and over.

Additionally, Andersen and Anderson indicate in their study the number of admission rate when population utilizing health care is lower in the urban area resident compare with rural area .(Anderson, 1973).

Moreover study conducted by (Saupe, 1987) in eight counties in southwestern Wisconsin and 529 house hold farm selected from eight counties 'are used to describe the distribution of health insurance coverage among households an analysis of health insurance coverage and investigate factors affecting health insurance coverage which include, household size, and education of household and the age .

The study found that the age significantly related to the coverage level, elder people more likely to join in health insurance whereas, and young operators' households are least likely to have health insurance coverage.

Study done by (Hongman Wang, 2008) about the factors associated with enrollment ,satisfaction, sustainability of new cooperative medical scheme program in six study area in rural Beijing , the main finding of this study is individual have better Education have more resources to acquire health care services . Also the study find that male are less likely to be enrolled compare with female in the (NCMS) scheme.

More over the study find that adequate knowledge about the policy increases the likelihood of continuous and participation in the scheme and that participants who are satisfied with the overall performance of the scheme tend to remain in the system.

The study define the knowledge of the scheme or the policy by two methods , first one know very well , the second method know little or do not know.

Study done by (Kong, 2010) the effect of marital status and gender on health care insurance in united states used the human capital theory . Study shows that have a much higher probability of having insurance than single, divorced, and widowed.

3.5 The impact of health insurance factors

The perception of consumer about health insurance scheme feature is very important to compare the rank and different perception between insured and uninsured household in term of price, quality and health care delivery.

Study conducted in Ghana 2011 used multinomial logistic regression was run to determine the association of identified perceptions on enrolment. The study found that the perceptions play major role of household decision to enroll in NHIS which influence by perceptions related to the health care provider in term of quality of health care, convenience, price and the benefits. Evidence from this study found that the insured household members believed that the quality of care were not achieving their expectations and satisfactions. Therefore quality of health care provided by health insurance played major role of increasing or decreasing the enrolment in health insurance..(Caroline Jehu-Appiah & Baltussen1, 2011).

Additionally, if persons are risk averse they should be willing to pay at least as much for insurance health premium as their expected annual health expenditure than the annual cost of flat fee insurance coverage. Therefore the study found that utilization cost and quality concerns were important.

Although lower price of insurance health through subsidies encouraged coverage in health insurance but only one third of participants were willing to pay full price of insurance health once the subsidy is stopped. This policy just increases the demand of insurance health among the previously uninsured household.(Rebecca Thornton1, 2009).

Distance is another important factor that affects the willingness to enroll in insurance health system, since most of individuals are prefer to get their health care services nearby their resident area. Moreover the existing of services near the location of client improve the quality of services, also good reputation of provider play important role in some other cases.(Peter Agyei-Baffour1, 2013).

One of the main factors affecting the enrollment in health insurance negative attitudes when providers' doubt about the impact of health insurance on their incomes. This situation detected in Viet Nam, where some doctors refused to give health care services to some insured patients.

The reason was that doctor wanted to receive under –the- table-payment as compensation for their lower salaries.

Additionally, Factors that help the transition to social health insurance is the level of income, extra income means better capacity to pay health insurance premium that increase the administration ability to run insurance health. More over this situation required sustainable economic growth. (Carrin, 2000b)

Some studies found that the enrollment in health insurance will be determined by different factors as follows:

Study conducted in USA by (Munnell*, 2009) offers the perceptions about what might happen to the pensioners under 65 and 65 years old and over when health insurance were removed.

The paper finds that the loss of health insurance would have deep effects on retirees less than 65 years more than retirees 65 and over and may affect the demand of health insurance especially among the groups such as near elderly who they had poor health condition it is difficult to work longer and also they have limited options to access health insurance.

3.6. Determinants of enrollment in social health protection programme among elderly people

The study done by (Parmar et al., (2014) used Cross-sectional household survey conducted using logistic regression model to study determinants of enrollment of elderly people

This study rely on households survey consist of two parts, Part one administrated to the head of household and collected data on basic demographic, socioeconomic, health status, health care utilization and awareness of scheme.

Part two administrated to ask questions include the concept of social exclusion to understand the enrollment of elderly people among NHIS in Ghana and Senegal 2012 (Parmar et al., 2014)which consist of four diminutions sociocultural variables , political variables and economics variables .

Sociocultural factor associated with persons who join as a member of any social group like sports club, religious groups or social groups and participating in different types of social activities especially among the elderly people so as to feel respected.

Moreover, there were a lot of persons needs help with activities of daily living may have different obstacle to participating in social and cultural activities until they were not feeling isolate from the society.

The results of sociocultural exclusion provide the importance of social support and solidarity in influencing enrolment forms in both scheme

For example the increase the principle of social solidarity would increase the enrollment .the solidarity also offered the respect to the older people and having positive perceptions on the respect afforded to older enrolling.

Bur the exclusion appeared when older people needs to obtain an ID card which required to presenting birth certification or taking three witness to confirm their nationality . These requirements may be difficult for some persons to obtain ID card and it is considered isolated in poor health or persons living in rural area.

The study also used the concept of political factors as determinant of social exclusion because Some people may not have access to the basic needs of living so as to participating with society due to the unavailability of resources or due to the barriers which prevent them to accessing available resources like health care facilities, save housing and easy to access information which include in Ghana information about clinics run by missions and NGOs. Which offered free health care to enroll, in contrast the persons should participating in the recent elections and being member of a political party.

The result show that Political factor play major role to determine the enrollment of elderly people in NHIS Plan Sesame in Ghana and Senegal respectively .For instance older people who has activities in civil society and participating in political activities like voting were more likely to enroll.

Also geographical area play major role of enrollment, people live in rural area less likely to enroll in the scheme, whereas the individual live closed to the health facilities more likely to enroll in the scheme.in addition the individual live in the urban area also increase the likelihood of enrollment.

Whereas Economics variables used the principle of household ownership of durable goods like (TV, radio, car) housing conditions like number of rooms, livestock then

divided household in to quartiles from Q1 which represent the poorest household to quartiles Q4 which represent rich household.

study investigate that 1/4th of the older people they had chronic illness which represent about 28% in Ghana and 25% in Senegal respectively moreover, the study also reported 11% in Ghana and 8% in Senegal visited hospital during last year.

The majority of the respondents lived more than 15 minutes far from health care facilities that represented the common challenge faced the elderly people. Moreover, a high proportion of elderly people were found either single or live alone.

The determinants of enrollment among elderly people in this study when household headed by men, having formal education, living in urban area are more likely enrolling in NHIS. Also study was found strong evidence of adverse selection associated with NHIS for both scheme where elder person who had chronic illness more likely to enroll in NHIS. Rich household also is more likely to enroll in NHIS compare with other old people live in poorest condition.

The study also investigate that there is economic exclusion and economic inequity among older people in term of enrollment in the both scheme in Ghana and Senegal. For example the richest quartiles being more likely to enroll than those in the poorest quartile. So, in Ghana older people who live in family owned house were more likely to enroll in NHIS than those who living in rental house, while in Senegal older people with their own source of income were more likely to enroll in the scheme. This finding indicate that poor family faced the barriers to access health care, in contrast rich persons more likely to access health care even received free enrollment in NHIS .

3.7. Perceived quality of services

Quality of health care services is considered one of the main determinants of enrolment in the health insurance scheme, study done in Burkina Faso consist of 20 focus on groups in five villages aimed to identify the criteria of care. Consist of four sub –scale, like follow up of patients, clinical examination, and reception of patients, admiration, waiting adequacy of resources and services and financial and physical accessibility .the study shows that perception of quality time, staff honesty, the second scale consist of adequate of doctors, equipment, availability of drugs, diagnostics, accessibility of health care.

The results showed that the respondents preferred the clinical practice and personnel attitude, while they were less satisfied about of health services is directly related to the socio demographic factors.(Baltussen, Yé, Haddad, & Sauerborn, 2002) .

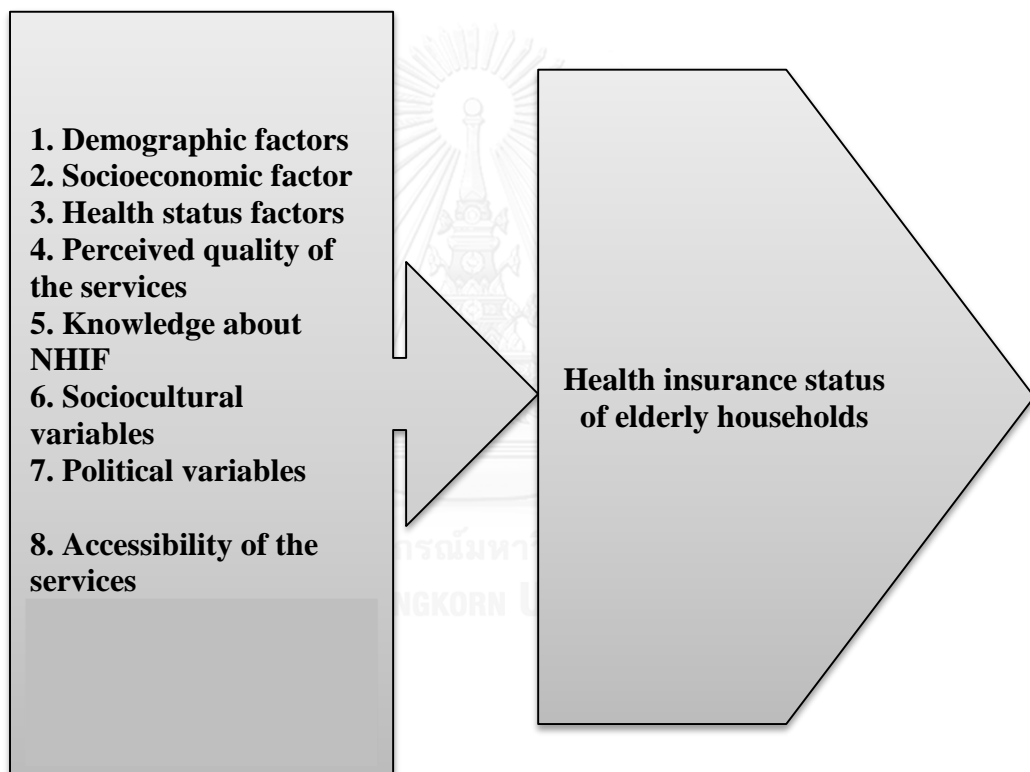


CHAPTER 4

CONCEPTUALFRAMEWORK

4.1. Conceptual framework

The demand for health insurance among elderly household is define by many factors which reflects the households characteristics like demographic factors, socioeconomics factors and health status factors, also investigate whether social exclusion determines enrolment of older people.



CHAPTER 5

RESEARCH METHODOLOGY

5.1. Study design

This is descriptive cross-sectional study we use primary data which was collected in 2015. The study uses semi-structured questionnaire that target elderly households in Gedarif city, Eastern Sudan. In order to classify between five target groups: elderly households Insured through NPF, NSSF, social subsidy, voluntary scheme and never insured households.

5.2. Population of study

The target population is elderly households which defined as those having household head or spouse who is at least 60 years of age. This definition is adapted from (Barry L. Steffen & Keith Fudge, 2011) .

5.3. Sampling size

Since the proportion of insurance status of elderly households were not known in NHIF in Gedarif state and the number of elderly household were not available in Sudan we used Cochran (1977) formula (Boateng, 2014)

To calculate the sample size (for estimated proportion approach) as follow:

$$n = \frac{t^2 p(1-p)}{e^2}$$

Where:

n = the sample size

t =the number relating to the degree of confidence anticipated in the result in this case 95% confidence interval (t=1.96 which is the abscissa of the normal curve).

P = an estimate of the proportion of elderly household who are insured.

In this case Krejcie and Morgan (1970) recommended that researchers use 0.50 as an estimate of the population proportion. This proportion will result in the maximization of variance, which will also produce the maximum sample size. (Boateng, 2014)

e =proportion of the acceptable margin of error (sampling error; 5% anticipated error).

$$n = \frac{(2)^2 50\%(1 - 50\%)}{(0.05)^2} = 400$$

After multiplied this number by (1.5) to take in to consideration design effect when the sample size will not meet the goal of the study therefore researcher has estimated design effect to adjust the required minimum sample size (Salganik, 2006) .

$$= 400 * 1.5 = 600$$

5.4. Sampling methods

To meet the objective of study the Proportionate allocation may not yield a sufficient number of cases for such detailed analyses. Therefore the suitable option is to oversampling the small groups by using disproportional distribution to come up with sufficient number of cases to offer requirement of analysis and provide appropriate sample design as follow:

Table 5-1. Final Distribution of Sample Size Using Disproportionate Allocation Approach

Type of programme	Disproportionate Stratified Sample Using Equal Allocation
NSSF (private sector)	120
NPF (public sector)	120
Social subsidies program	120
Voluntary scheme	120
Noninsured	120
Total	600

5.5. Sampling frame

Accordingly, to the above distribution of sample size, we selected 60 neighborhoods (i.e. two individuals per health insurance status and neighborhood) out of 107 neighborhoods which represent the total number of neighborhoods in Gedarif city Then, the city was divided into 5 geographical areas (North, South, West, East and middle). The number of neighborhoods was calculated according to the weight of neighborhoods in each geographical area. The weight was calculated by dividing the number of neighborhoods in each geographical area by the number of total neighborhoods in Gedarif city. Then the weight of each geographical area was multiplied by 60 to obtain the number of neighborhoods in each geographical area as shown in table 5-2.

Table 5-2. The Target Neighborhoods per Geographical Area

Geographical area	No. of neighborhoods In each geographical area	The weight of neighborhoods in each Geographical area	NO. of selecting neighborhoods according to the weight
North	9	8	$8*60=5$
East	35	33	$33*60=20$
West	42	39	$39*39=23$
south	17	16	$16*16=10$
Middle	4	4	$4*60=2$
Total	107	100%	60

Then we used the excel command to randomize between bottom and top to select the first number of neighborhoods in each geographical area from a list of neighborhoods. Then the rest of neighborhoods follows the selected number interval as shown in table 5-3.

Table 5-3. Selected Neighborhoods in Each Geographical Area

Geographical area	Number of neighborhoods	Target number of neighborhood	Selected neighborhood
North	9	5	8,1,3,5,7
East	35	20	34,1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,,35,32
West	42	23	41,1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,,35,37,39,40,2.
south	17	10	16,1,3,5,7,9,11,13,15,17
Middle	4	2	3,1.
Total	107	60	60

After specified the target numbers of neighborhood ,we selected (10) households from each neighborhood which consist of 2 households per insurance status in each category insured through NPF, insured through NSSF, insured through social subsidy, insured through voluntary scheme and never insured .

(2) Households per insurance status* 60 neighborhood) we got 120 households per insurance status from each category. Then multiple this number by 5 category (120* 5) to obtain 600 observations.

At first we started to select sample size from the north geographical area then West, south, east and lastly from the middle.

The elderly households selected systematically anticlockwise of the corner in the North West in each neighborhood, if no eligible elderly household was found, the next house was selected till an eligible elderly household was found. After that we continued to select the elderly households till reached the target number of participants for each insurance category.

5.6. Inclusion criteria

Before conducted the interview, there is criteria to determine the eligible elderly households from target sample size, and one of these criteria is:

1. Birth certificate
2. Any official documents (ID card –passport, etc.)That include the age of the household head or his/her spouse.
3. Retirement documents associated with the age.

5.7. Data collection

A semi-structured questionnaire was distributed to 600 eligible elderly households' head who are representing the elderly households head in Gedarif City.

The first part of the questionnaire include demographic questions such as age, sex, marital status, education and socioeconomic questions for the participants such as income, occupation, source of live hood, family size, distance from nearest health facilities, and household expenditure.

Then we asked questions about health status of respondents such as, chronic illness, number of visit, health care expenditure.

Moreover, we asked about specific questions to each group to explain their knowledge about the National Health Insurance Fund in Gedarif state. Then we used the concept

of social Exclusion Knowledge network across two dimensions (sociocultural – political-) to identify the domains related to resources and participation that are important for understanding social exclusion.

5.8. Research assistant

Ten Officers from Gedarif NHIF executive directorate were selected and trained to conduct the questionnaire and collect data from the target household.

5.9. Data quality assurance

1. Assign individual accountable for data quality in each site this person should be knowledgeable for all procedures and definitions in questionnaire also should be ensure that all data are valid and accurate
2. Assessment of Training and determine the Competency of Personnel for collecting data through conduct Routine cognitive testing to ensure all collectors understand the procedure.
3. Daily follow-up from the researcher to ensure that all the procedures of collecting data is correct.

5.10. Data management

1. Dependent variables

Table 5-4. Dependent Variables

Category	definition	Measurement
Never insured	Never insured in NHIF	=0
Insured through NPF	Retiree HH from NPF	=1
Insured through NSSF	Retiree HH from NSSF	=2
Insured through social subsidy fund	Poor families	=3
Insured through voluntary scheme	Self-employees	=4

2. Independent variables

Table 5-5 Definition and Descriptive Statistics of Variables

	variables	Definition	Measurement
Demographic factors	1. Age of head of HH	The age of the head of household (in completed years)	Age / year 60+ and over
	2. Gender of head of HH	=1 If male , =0 if female	Male/ female
	3.highest level of Education completed by the head of the household	=1 if secondary or high, =0 other wise	Non- formal /primary /secondary /university or higher
	4.Marital status of head of HH	=1 if married , =0 if otherwise	Married / single /divorced widow
	5.Legal dependents	Number of legal dependents	Number
2. Socio economics factors	6 .Income of the of HH	Average monthly income of the household in Sudanese SDG	SDG per month
	7.Employment status of the head of the household	4 dummy variables: 1= Retiree from NSSF and 0 otherwise 1= Retiree from NPF and 0 otherwise 1= Farmer and 0 otherwise 4= Day labor and 0 otherwise	
	8. food expenditure	Average food expenditure per month in SDG	SDG

	9.Health expenditure	Average family health expenditure per month in SDG	SDG
3.Health status of the of the HH members	10.chronic illness	Dummy variable:1=if there is one of the household member have chronic illness(diabetes mellitus, hypertension, heart diseases, tuberculosis, asthma) 0=if not	Yes /no
	11.Distance of nearest health facility	1= if 5 Km or less , 0 = more than 5Km	Km2
	.12.number of visits	Average number of visit to health facility per month during last 3 months by household members	Average number of medical consultation per month
	13.Health facility type	Dummy variable:1= if direct health care facility , 0 = otherwise	Facility type Operated by NHIF, operated by ministry of health or other entities
4..Perceived quality of services	14.satisfaction	Dummy variable: 1= satisfied, = 0 otherwise	Satisfied from the services provided by NHIF
5. Knowledge	15.Knowledge about health insurance scheme	1= if very well knowledge (answer all three questions) = 0 other wise	Know the purpose of NHIF, the procedure of enrolment and the medical package provided by NHIF
6.Sociocultural variable :	16.Member of any association	= if member , =0 otherwise	a member of any association or club; participating in social events
	17.Respected	=1 If elderly feel are respected these days, =0 other wise	Feel that elders are respected in society

7.political variable	18.Need help	=1 if needs help in activities of daily living; =0 otherwise	Needs help in undertaking daily activities like living, walks alone
	19.Access information	=1 if having TV or Radio , =0 otherwise	access to a television or a radio
	20.Live in safe housing	= 1 if live in safe housing , =0 other wise	Live in safe neighborhoods (Feel that it is safe to walk alone)
	21.Decision making role	= 1 If participating in Decision making role , = 0 other wise	participating in a decision making role in an association

5.10. Data analysis

Multinomial logistic regression:

We used multinomial logistic regression to investigate the relationship between the health insurance status of the health of household elderly household, and the different predictors

Additionally, we run binary logic regression to find out the relationship between insured and never insured elderly household in Gedarif city

Model specification:

As the dependent variables is the health insurance status of the head of elderly households, and it has five categories:

Insured through NPF

Insured through NSSF

Insured through social subsidy fund

Insured through voluntary scheme

Never insured

Accordingly, our model specification was being:

Health insurance status = f(Age, Gender, , Marital status, , Education, income, legal dependent ,chronic illness, health facility type , number of visits , knowledge about NHIF, satisfaction about scheme, distance of nearest health facility , member of any association, respected , need help, access information, live in safe housing, have decision making role

P health insurance status = P (Insured through NPF) + P (Insured through NSSF) + (P Insured through social subsidy) + (Insured through voluntary scheme) + (Never insured) = 1

Where: P = probability of each category. The general model equation as in (Caleb Michael Akers, 2014) is:

The general model equation as in (Caleb Michael Akers, 2014) is:

$$\text{Therefore, } \Pr(y_i = j) = \frac{\exp(\mathbf{x}_i \mathbf{B}_j)}{1 + \sum_i \exp(\mathbf{x}_i \mathbf{B}_i)}$$

So:

$\Pr(y_i = j)$ = is probability of belonging to group j

X_i = vector of explanatory variables

B_j = are the coefficients, which are estimated using maximum likelihood estimation.

Where $Y = 0$ if never insured

$Y = 1$ if insured through NPF

$Y = 2$ if insured through NSSF

$Y = 3$ if insured through social subsidy program

$Y = 4$ if insured through voluntary scheme

Marginal effect

The marginal effect of an independent variable (X) measures the impact of change in an independent variable (X) on the expected change in the dependent variable (Y) in a regression model, especially when the change in the independent variable is substantially small or just marginal. The marginal effects of each independent variable X on the dependent variable Y were computed by taking the partial derivative of $E(Y | X)$ with respect to X if the independent variable is continuous and thus differentiable.

Table 5-6. Independent Variables Measurement and Expected Sign

variables	Definition and measurement	Expected sign	Reasons	Selected references
1.Age of head of HH	The age of the head of household (in completed years)	+	Health utilization based on benefits, age takes U-shaped pattern .among the elderly	(Saupe, 1987),
2.Gender of head of HH	Dummy variable:1= if the gender of the head of the household male and , 0= is female	+/-	Females are more utilized for health care services in compare with male , therefor more likely to be insured in health insurance	(Mustafa, 2013)
3.:Educationa l level completed by the head of the household	Dummy variable: 1= higher education (secondary , university or higher), 0 = other wise	+/-	Educated HH More capable to evaluate the benefits they will get by health insurance	(Anderson, 1973).
4.Marital status of head of HH	Dummy variable:1=married 0 = single, divorced, widows	+	Responsibilities towards the family member push the head households covered their family members more than those single marital status.	(Kong, 2010)

5.Income of the head of HHs	Average monthly income of the household in Sudanese SDG	+	Increase income lead to increase the ability to pay the premium (affordability) specially self-employment who has no sponsor	(Bhat & Jain, 2006) . (Carrin, 2000b)
6.Health status of the head of the HH member	Dummy variable: 1=if there is one of the household member have chronic illness(diabetes mellitus, hypertension, heart diseases, tuberculosis, asthma) 0=if not	+/-	The households with good health status are less likely to participate in HI compare with poor or medium health status.	(Anthony Kusi1, 2015)
7.Legal dependents	Number of legal dependents	+	Households which had numbers of children more likely insured in health insurance	(Anthony Kusi1, 2015)
8.Distance of nearest health facility	1= if 5 Km or less , 0 = more than 5Km	+	Health accessibility increase the participation in HI.	(Peter Agyei-Baffour1, 2013).

9..numberof visits	Average number of visit to health facility during last 3 months by households members	+	Households utilized health services several times more likely insured in HI	(Hongman Wang, 2008)
10..Knowle dge about health insurance	1= if very well knowledge (answer all three questions) 0= little or do not Know	+/-	Adequate knowledge about health insurance scheme increase the likelihood of participation in HI	(Hongman Wang, 2008)
11.Perceive d quality of services	Dummy variable: 1= satisfied, 0= not satisfied	+/-	High quality of health care services increase the probability of enrolment in the scheme, while bad quality will reduce the demand of HI	(Caroline Jehu-Appiah & Baltussen1, 2011)
12.Health facility type	Dummy variable: 1= if direct health care facility , 0 = otherwise	+/-	Health facilities operated by NHIF	(Mustafa, 2013)

Table 5-7. Dimensions and Variables

Dimension	Domain	Variables	Expected sign	Reasons	Citation
Sociocultural	13.Social and community participation	1=if Member of an association, 0= not	+/-	To reflect whether elderly household were member of any association or not.	(Parmar et al., 2014)
	14 .Social discrimination	1= if Feel that elders are not respected in society, 0= not	+/-	To indicate whether elderly household feel respected	
	15..Social dependence	1=if Require help in undertaking activities of daily living, 0=not	+/-	Elderly who required help may cannot participate in the social and cultural events	(Parmar et al., 2014)
<i>Political variables</i>	16..Access to information	1= if have television or a radio in the house, 0= not	+/-	Elderly households may not have access to the necessary resources like TV or radio	
	17..Decision making role	1=if have a decision making role	+/-		

	in an association, 0= not have		are possible to participate with communities in terms of decision making , access information or live in safe housing	
18..Access to safe housing	1= if live in safe neighborhood 0= not have	+/-		



CHAPTER 6

RESULT AND DISCUSSION

6.1. Result:

In this part the study describe the health status of elderly households, demographic and socioeconomic factors then we ask specific question about health insurance knowledge among five different group of participants (never insured- insured through NPF- insured through NSSF- insured through social subsidy program- insured through voluntary scheme.) in Gedarif city –Sudan.

The survey was conducted in June 2015 in Gedarif city include 60 neighborhoods.

Semi- structure questionnaire was distributed to 600 elderly household, questionnaire consist of questions about health status , demographic, socioeconomics and the knowledge about health insurance fund in Gedarif city then we asked questions about sociocultural and political variables to determine whether elderly suffered from social exclusion or not

6.1.1 Descriptive analysis:

1. Heath status of elderly households

Table 6-1. Heath Status of Elderly Households

Health insurance status	no have chronic illness		have chronic illness	
	freq	percent	freq	percent
never insured	73	60.83	47	39.17
insured through NPF	70	58.33	50	41.67
insured through NSSF	41	34.17	79	65.83
insured through social subsidy fund	68	56.67	52	43.33
insured through voluntary scheme	42	35.00	78	65.00
Total	294	49.00	306	51.00

The indicators of measured the health status of the head of the elderly households in this study by the presence or absence of chronic illness among the respondents, from the table above the result shows that 306 (51%) of the respondents suffered from chronic illness, while 294 (49%) have no chronic illness within elderly households member.

Never insured group is considered better health status in compare with insured groups only 39.17 % have chronic illness, whereas NSSF group and voluntary scheme group considered worse health status groups represent by 65.83% and 65% respectively

2. Gender of the head of the elderly household:

Table 6-2. Distribution Gender among the Participants

gender	Freq.	Percent
female	74	12.33
male	526	87.67
Total	600	100

Table 17 shows that males are dominant as ahead of elderly households compare with the female, since represent 526 (87.67) from the total respondents whereas, the female represent only by 74 (12.33) .

3. Education level of the head of the household:

Table 6-3. Education Level of the Head of the Households

Educational level	freq	Percent
Non-formal	149	24.83
primary	151	24.17
secondary	178	29.67
University or higher	122	20.33
total	600	100

The table 18 shows that the most frequent level of the head of the elderly households is secondary level which represent about 178 (29.67) of the total respondents then

followed by primary education 151 (24.17), non-formal education 149 (24.83) lastly university or higher level which represent by 122 (20.33) .high representative of secondary school among respondents due to the presence of two categories of retiree from NPF and NSSF most of them are personnel's in public and private sector before retired .

4. Marital status of elderly household:

The majority of respondents are married represent about 531 (88.5) whereas the rest of respondents either divorced or widows represent 26 (4.33%) and 43 (7.17%) respectively as shown in the table below.

Table 6-4 Marital Status of Elderly Household

marital status	Freq.	Percent
married	531	88.5
Divorced	26	4.33
widows	43	7.17
total	600	100

Income of health insurance status:

Table 6-5 Income of The Elderly Households

	Mean	Std.Err
Over Income of HHS		
Never insured	1687.917	124.8262
Insured through NPF	1679.042	60.74973
Insured through NSSF	1071.733	50.76353
Insured through social subsidy fund	1159.167	66.95399
Insured through voluntary scheme	1956.917	117.9794

From table 20 the result shows that the members of voluntary scheme group represent highest income among different groups, since the mean of income equivalent 1956.9 SDG, this finds reflect the nature and characteristics of this group (self-employed) in terms of their ability to pay the premium, while NPF, NSSF and social subsidies represent social protection groups since their income less than never insured group. Therefore, some entities paid their premium on behalf like Zakat fund and FMOF for poor family, NPF for retiree of NPF and NSSF for retiree of NSSF.

5. Occupation of respondents among different group

Table 6-6 Occupation of Respondents Among Different Group

occupation	Freq.	Percent
NPF	120	20
NSSF	120	20
Farmer	116	19.33
Day labor	244	40.67
Total	600	100

Among different groups, 244 (40.7%) are day labor from the total number of respondents who works in different type of jobs like tailors, hawkers. The second type of the respondent's occupation is farmers represent by 116 (19.33%)

The rest of the respondents are pensioners of NPF and NSSF represents about 120 respondents in each group respectively.

Table 6-7 Cross Tabulation Between Day Labor And Never Insured Group, Social Subsidy Fund and Voluntary Program

occupation	Never insured	Insured through voluntary scheme	Insured through social subsidy program	Total
Day labor	80 (32.79)	73 (29.92)	91 (37.3)	244 100

From table (6-7) above the study shows that 80(32.79%) respondents from day labor from never insured group, 73 (29.92%) are insured through voluntary scheme and 91(73.3%) insured through social subsidy fund.

6. Distribution of respondents among Health care facility in Gedarif city

Table 6-8 Distribution of Respondent among Health Facility in Gedarif City

Type of health provision	freq	percent
in -direct prevision	226	37.67
direct prevision	374	62.33
Total	600	100

According to the system of NHIF in Gedarif city which providing health care for insured people the health Care facilities divided into two types, direct provision of health services and indirect provision.

The direct provision owned and operated by NHIF which consist of 14 health care center, 6 community clinic, and main center for poly-clinics used for sophisticated diagnostics. The other healthcare facilities operated by state ministry of health consist of 8 hospitals and 7 health care Center, and 19 specialist clinics .The study found that 374 (62.33) access medical services from direct health care facilities which operated by NHIF

. Distribution of legal dependents among health insurance status

Table 6-9 Distribution of Legal Dependents among Health Insurance Status

legal dependents	Mean	Std.Err
never insured	4.925	0.2552426
insured through NPF	3.191667	0.1416667
insured through NSSF	4.008333	0.1842905
insured through social subsidy fund	4.65	0.2489896
insured through voluntary scheme	4.141667	0.1849732

Table 25 illustrate that the average number of legal dependents among never insured group is large in compared with those insured groups. The never insured families most likely belonged

to informal sector which is characterized with low education level and poor families. In Sudan context on average the educated and well-off families always have low average number of legal dependents. According to NHIF database the average number of families for those insured families are 3.5 members, while 2008 Sudan census revealed that the overall family size was 5.99 members. (CBC, 2008)

8. Number of visits among different group

Table 6-10 Number Of Visits

Number of visits	Mean	Std.Err
never insured	3.108333	0.150068
insured through NPF	2.491667	0.133366
insured through NSSF	3.441667	0.142897
insured through social subsidy fund	3.533333	0.132279
insured through voluntary scheme	3.458333	0.10775

Table 26 shows the average number of visit about 3 times per month, insured through social subsidy, voluntary scheme and NSSF are the most frequent, while NPF is least frequent among the different groups. This result confirms that the average number of family members in this group lower in compared with other groups, as shown in Table 23 above.

9. Distance of nearest health facility

Table 6-11 Distance Of Nearest Health Facility

Distance of nearest health facility	freq	percent
More than 5 Km	113	18.83
Less than 5 Km	487	81.17
Total	600	100.00

In term of distance of nearest health care facility the study found that, 487 (81.17%) from the respondents were access medical services from facilities less than 5Km,

whereas the rest of respondents 113 (18.83%) they were access medical services more than 5 Km far from nearest health facilities.

10. Perceived quality of services:

1. Waiting time

Table 6-12 Waiting Time

waiting time	Freq.	Percent
less than 30 minutes	91	15.45
from 30-60 minutes	263	44.65
more than 60 minutes	235	39.9
Total	589	100

Waiting time is consider one of the main aspect to measure perceived quality of services in term of the time which the households spent it before seeing by the providers . The table 28 shows that the average waiting time before the respondents seeing by the providers, 44 .65% of the respondent said they need between 30-60 minutes until received the provider, while 39.9 % participants wait more than 60 minutes so as to access medical services, the remaining respondents 15.45% said they were wait less than 30 minutes only before getting access to the provider.

Although the medical service is available for the respondents as a result of the above table 27, but access to medical service requires a long waiting time, the reason for this is due to the limited number of medical staff.

2. Satisfaction of respondents from medical services

Table 6-13Satisfaction with Provider Services

satisfaction	Freq.	Percent
no satisfied	269	44.83
satisfied	331	55.17
Total	600	100

The study measured the satisfaction of the participant from the provider services according to the specific aspects like Staff attitude, presence of full medical staff, price of services , availability of drug and laboratory service to investigate whether the respondents were satisfied or not. The table below shows that 331 (55.17%) of respondents were satisfied from the health services provided by NHIF facilities whereas 269 (44.83) respondent were not satisfied.

Beside examine the satisfaction of target groups, the study also come up with the reasons of dissatisfaction of the respondents depend on the perceptions of participants towards specific considerations as shown in the table below:

Table 6-14 Reasons of Dissatisfaction

reasons of dissatisfaction	Freq.	Percent
bad attitude of staff	14	5.2
long waiting time	124	46.1
high cost of drug	14	5.2
Inadequate staff	12	4.46
Lack of drug in pharmacy	45	16.73
Lack of laboratory investigation	14	5.2
Low quality of service	46	17.1
total	269	100

The study found that 46.1% suffered from long waiting time 17.1 % complaining from low quality of the services provided by NHIF , 16.73 respondents said there is lack of drug in pharmacies , 5.2% mentioned bad attitude of staff, high cost of drug and Lack of laboratory investigation respectively , while 4.46% said there is no enough staff in the health services.

11. Knowledge about NHIF scheme:

Study examined the Knowledge of scheme among different target groups.

In term of the purpose of national insurance fund, procedures of enrollment and services package provided by national insurance fund.

Surprisingly, 54.83% respondents have little or not have any well information about NHIF in Gedarif city, whereas 45.17% they have very well knowledge about scheme.

Although the majority of the respondents are insured.

Table 6-15 Knowledge about NHIF Scheme

Knowledge	Freq.	Percent
Not Knowledge	329	54.83
Knowledge	271	45.17
Total	600	100

Because the Knowledge about scheme is an important determinant for participation in the scheme, we run cross- tabulation between dependent variable health insurance status and independent variable knowledge to investigate the level of knowledge among different target groups as shown in the table 29.

Cross tabulation between health insurance status and Knowledge

Table 6-16 Cross Tabulation between Health Insurance Status and Knowledge

Health Insurance status	no knowledge		knowledge	
	Freq	percent	Freq	percent
never insured	75	62.5	45	37.5
insured through NPF	56	46.67	64	53.33
insured through NSSF	58	48.33	62	51.67
insured Through social	76	63.33	44	36.67
insured through voluntary scheme	64	53.33	56	46.67
Total	329	54.83	271	45.17

From the table 29 above we found that never insured group, insured through social subsidy and insured through voluntary scheme are less knowledgeable about the scheme compare with insured groups from NPF and NSSF, This finding confirm that the level of Education play major role to determine the knowledge about the scheme when more educated groups like NPF and NSSF are more knowledgeable about the scheme in compare with other group.

4. Reasons for not enroll according to the never insured perspectives:

Table 6-17 Reasons for Not Enroll according To the Never Insured Perspectives

Reason for not enrolling	Freq.	%
They did not know how to enroll in the NHIF	20	16.67
Am healthy	8	6.67
I have no heard about the scheme	17	14.17
Financial hardship	25	20.83
Health facility is far from my residence	11	9.17
Public local committee did not select me to enroll through social subsidy fund	30	25.00
Medical package is not enough	5	4.17
Other	4	3.33
total	120	100.00

When we asked never insured participants about why did not enroll in the scheme, 25% said the public local committee did not select us to enroll in the scheme, while 20.83% respondents reported they have financial hardship, 16.67 said they did not know how to enroll in the scheme, 14.17% said have no heard about the scheme, 9.17% health facility is far from their residence., 6.67% said they are healthy.

4. Cross tabulation between insurance status and health expenditure

Table 6-18 Cross Tabulation between Insurance Status and Health Expenditure

health insurance status	Mean	Std. Dev.	Freq.
Never insured	135.9583	110.0216	120
Insured through NPF	69.95833	76.16462	120
Insured through NSSF	43.95	24.68043	120
Insured through social subsidy	57.41667	50.71333	120
Insured through voluntary scheme	74.91667	72.56693	120
Total	76.44	78.98018	600

From table 30 the study shown that the mean of health expenditure among never insured group about 135.9 SDG almost double compare with insured groups. Insured through NSSF lower health expenditure among different groups spend only 43.9 SDG per month.

Tabulation between insured and un-insured VS. Member of any association:

Table 6-19 Tabulation between Insured and Un-Insured VS. Member of Any Association

	Not member	member	Total
Never insured	106	14	120
insured	367	113	480
Total	473	127	600

From table 31 our study shows that 127 respondents participating as a member of association. 113 respondents are insured and 14 never insured, while the majority of respondents did not joined with any association. This finds indicate that when the elderly households participate in any association more likely to be insured in NHIF.

6.1.2. Statistical measures for continuation variables

From the table above, the mean of the age of respondent is 66 years old. Minimum age of respondent is 60 years old where maximum age is 98 years old. The legal dependent of the elderly household is 4 members. The average monthly income is 1510.96 where the average monthly food expenditure is 1244.96 SDG represent about 83.4 % of respondents income spent on food only with medical expenditure 75 SDG. This result indicate that there is low Socioeconomic Status among elderly households and low financial Protection. The average monthly number of visit is 3 time per month this funding Confirm that Elderly people seeking for medical services more than other people.

Table 6-20 Descriptive Analysis of the Continuous Variables

Variable	Orbs	mean	medians	deviation	min	max
HHS Ag	600	66.05333	66	6.589856	60	98
Legal dependent	600	4.183333	4	2.343546	1	15
Income of HHS	600	1510.955	1000	1036.721	300	7000
Food expenditure	600	1244.958	1000	688	300	5000
Health expenditure	600	75.315	75	74.47135	10	500
Number of visits	600	3.206667	3	1.51364	1	10

Premium payment

Table 6-21 Premium Payment

Groups	Sponsor	Payment Mechanism	amount	Freq.
NPF		monthly based Deduction	20 SDG	120
NSSF	NSSF	monthly based Deduction	20 SDG	120
Social subsidy fund	FMOH	Flat rate monthly based	40SDG	120
	Zakat fund	Flat rate monthly based	35 SDG	64
Voluntary scheme program	Their own-pocket	Flat rate monthly based	40 SDG	56

Interestingly, those who have some entities pay the premium on behalf of them pay less than those pay from their own pocket, which is not equitable manner. Thus the enrolment of self-employed sector elderly households persist prominent challenges to achieve their universal coverage. The cross-subsidization and the consideration of vertical and horizontal equity are very crucial concepts in protection of this important limited income social layer.

6.1.2 .Binary logistic model:

We run binary logic regression to find out the relationship between insured and never insured elderly household in Gedarif city.

Table 6-22 Binary Logistic Model

Insured and never insured	dy/dx
HHs Age	0.004912**
Gender (male)	-0.09877*
Education (secondary or higher)	0.098046
Marital status(married)	0.07084
Income of HHS	-0.00005
Facility type(direct provision)	0.179546
Legal dependent	-0.02133
Chronic illness(have chronic illness visits	0.03808
	0.009958
Distance(less than 5Km)	0.069351**
satisfaction	0.072492***
Knowledge(very well Knowledge)	0.031695
Member (member of association)	0.0672
Respected(if believe is respected)	0.015564

Need help(need help in daily live)	0.051868
Have TV(received information)	0.211272***
Safe housing	-0.03789
Decision making role	0.03892
_cons	0.03892

Number of obs = 600

LR ch2 (18) = 161.96

Log likelihood = -219.25935

Prob> ch2 = 0.000

The outcome of logit model shows there are many significant factors reflect the relationship between insured elderly household and never insured like, Age, gender, education, income, distance, satisfaction and access information.

An increase the Age of head elderly household by one year the probability of being covered by NHIF would increase by 0.5%.

The head of household being educated most likely covered by NHIF by 9.8% more than never insured elderly household.

Increase income of head of elderly household by one thousand Sudanese SDG the probability of being insured would decrease by 0.05%

The accessibility of health care facility near the residence of elderly house hold (5Km or less) more likely increase the probability of insured in NHIF by 6.9%

Insured elderly household head more likely satisfied from the services provided by NHIF than never insured elderly household by 7.2%.

The elderly house hold head being have TV more likely insured in National Health Insurance Fund by 21% more than house hold that cannot access TV.

6.1.3. Multinomial regression result: Model (A) basic sample

Number of obs	=	600
LR chi2 (48)	=	486.23
Prob > chi2	=	0.0000
Pseudo R2	=	0.2518
Log likelihood	=	-722.5498

Table 6-23 Model (A)

Health ins	M.effect1	M.effect2	M.effect3	M.effect4
HH Age	0.002811	0.0015539	0.0015147	-0.0001494
gender	-0.0430625*	-0.0145596	0.0335579	-0.087532***
education	0.2623506***	0.0166856***	-0.0936158	-0.0517238***
Marital status	0.1920092***	-0.0239022	-0.0972991	0.0203769
Income of HHS	0.0000427	-0.0001634***	-0.0000605***	0.0001069
Facility type	0.0302443***	0.0023814***	0.0618078***	0.1650218***
Legal dependent	-0.032309***	0.0044208**	0.0146499	-0.0093054***
Chronic illness	-0.0185019	0.1102126***	-0.0946813	0.0747619**
visits	-0.0474649*	0.0131085	0.0485313***	-0.0055973
Distance	0.159263***	-0.0156004	0.0140509**	-0.0669379
satisfaction	0.1224911***	-0.0080536	0.0906809***	-0.1514799*
Knowledge	0.0194581*	0.0926862***	-0.0139749	-0.0312274
_cons				

Never insured is reference group

* Significant at% 10 significant level

** Significant at %5 significant level

*** Significant at %1 significant level

Marginal effect1 for NPF group

Marginal effect 2 for of NSSF group

Marginal effect 3 for social subsidy group

Marginal effect 4 for voluntary scheme group

In comparison with never insured group, we found that many variables are significant among different insured group in compare with never insured group.

Gender is statistically significant at $P < 0.01$ with coefficient and marginal effect negative sign. The head of household being male less probability being insured in NHIF through voluntary scheme by 8.8 percent relative to never insured group.

Education is statistically significant with coefficient and marginal effect positive sign. High educated head households most likely insured through NPF, NSSF and voluntary scheme by 26.2 percent, 1.7 percent and 5.2 respectively in compare with reference group. Given other variables are held constant.

Marital status was statistically significant the coefficient and marginal effect were positive this result indicate that the head of elderly household member the relative probability of being married insured in NHIF would increase by 14.8 percent in compare with never insured group, given other variables are kept constant.

Income was statistically significant the marginal effect and coefficient were negative the result reflect that the head of elderly households from NSSF group the relative probability of their income would decrease by 0.016 percent in compare with reference group.

The type of health care facility statistically significant the marginal effect and coefficient are negative the finding of this result indicate that the head elderly households members of NPF and NSSF groups who utilized medical services in the nearest health care facilities operated by NHIF the relative probability of being insured would decrease by 3 percent and 0.2 percent respectively in compare with reference group. Given other variables are kept constant.

Whereas, facility type statistically significant the marginal effect and coefficient are positive this result revealed that the head of elderly household from social subsidies fund and voluntary scheme who utilized medical services provided by NHIF the relative probability of being insured in NHIF would increase by 6 percent and 16.5 percent respectively in compare with never insured group. Given other variables are kept constant.

Legal dependent was statistically significant, the coefficient and marginal effect were negative, the result shows that the number of legal dependents of the NPF and voluntary scheme groups the relative probability for being insured in NHIF would decrease by

3.2 percent and 0.9 percent respectively in compare with never insured group , given other variables are held constant.

While, the legal dependent of NSSF was statistically significant the coefficient and marginal effect were positive , this that mean the number of legal dependents of NSSF the probability of being insured in NHIF would increase by 1.5 percent in compare with reference group , given other variables are kept constant.

Number of visits was statistically significant the coefficient and marginal effect were negative, the result shows that the number of visits of the NPF members less likely utilized health services by 4.7 percent in compare with reference group. While the number of visits was statistically significant, the coefficient and marginal effect were positive, the result indicate that the number of visits of social subsidies fund more likely utilized health care services by 4.9 percent relative to never insured group, given other variables are held constant.

Distance from nearest health facility is dummy variable (1= 5Km or less, 0= more than 5Km) the coefficient and marginal effect were positive and significant in NPF and social subsidy fund, the study shows that member of NPF and social subsidy fund who live 5Km or less from nearest health facilities the probability of insured in NHIF are higher by 15.9 percent and 1.4 percent respectively in compare to the reference group. Satisfaction was statistically significant in both group NPF and social subsidy fund the coefficient and marginal effect were positive this finding indicate that the NPF and social subsidy member the relative probability of being insured would increase by 12.2 percent and 9 percent respectively in compare with never insured group, given other variables are kept constant.

While, the probability of satisfaction among voluntary scheme member would decrease by 15 percent in compare with reference group.

Knowledge was statistically significant in both group NPF and NSSF the coefficient and marginal effect were positive this finding indicate that the NPF and member who have well knowledge about NHIF the relative probability of being insured would increase by 1.9 percent and 9.2 percent respectively in compare with reference group. Given other variables are kept constant.

6.1.4. Multinomial logistic regression Model (B) full sample model

Number of obs = 600
 LR chi2 (72) = 610.79
 Prob > chi2 = 0.0000
 Log likelihood = -660.26821 Pseudo R2 = 0.3163

Table 6-24 Model (B)

HI status	M.effect1	M.effect2	M.effect3	M.effect4
HH Age	0.003476***	0.001631	-0.00063	0.000503
gender	-0.01865	-0.01623	0.040219	-0.09551***
education	0.218171***	0.004578	-0.08857	-0.04278
Marital status	0.147705***	-0.02814	-0.07775	0.036228
Income of HHS	0.000413	-0.00016***	-0.0000598***	0.0001
Facility type	0.02297***	0.013222***	0.034063***	0.160723***
Legal dependent	-0.02814***	0.000167***	0.017376	-0.01118***
Chronic illness	-0.01951	0.102953***	-0.1154	0.071057***
visits	-0.04107***	0.010586	0.04906***	-0.0071
Distance	0.123886***	-0.00438	-0.00289	-0.05834
satisfaction	0.113794***	-0.02319	0.121289***	-0.14169
Knowledge	0.039959*	0.072528***	-0.03193	-0.044
member	-0.07061	0.005567	0.116645***	0.019402
respected	0.032027*	0.033022	-0.02852	-0.02091
Need help	-0.04071	0.095489	-0.03006	0.021673
Have TV	0.079598***	-0.11106***	0.212758***	0.037131***
Safe housing	0.081254	0.086804	-0.17815***	-0.02111
Decision making role	-0.0704	0.063195*	0.023475	0.024713

Never insured is reference group * Significant at% 10 significant level

** Significant at %5 significant level

*** Significant at %1 significant level

Marginal effect1 for NPF group

Marginal effect 2 for of NSSF group

Marginal effect 3 for social subsidy group

Marginal effect 4 for voluntary scheme group

The result of model B shows that most independent variables are significant.

Age which is continuous variable, the sign is positive and its statistically significant at the model show that holding other variables are constant, any additional year in members of NPF the probability of being insured in the scheme would increase by 0.3 percent in compare to the never insured group given other variables are kept constant. Gender is statistically significant with coefficient and marginal effect negative sign. The head of household being male less probability being insured in NHIF through voluntary scheme by 9.6 percent relative to never insured group Education is statistically significant with coefficient and marginal effect positive sign. High educated head households most likely insured through NPF would increase by 21.8 percent, in compare with never insured group given other variables are kept constant.

Marital status was statistically significant the coefficient and marginal effect were positive this result indicate that the head of elderly household member of NPF the relative probability of being married insured in NHIF would increase by 14.8 percent in compare with never insured group, given other variables are kept constant.

Income is statistically significant ,The coefficient and marginal effect were negative among NSSF and social subsidies members which shows that the relative probability of being insured in NHIF would decrease by 0.016 and 0.006 respectively in relative to the reference group, given that other variables are kept constant.

The type of health care facility statistically significant the marginal effect and coefficient are negative the finding of this result indicate that the head elderly households members of NPF, groups who utilized medical services in the nearest health care facilities operated by NHIF the relative probability of being insured in NHIF would decrease by 2.3 percent in compare with reference group. Given other variables are kept constant.

While, NSSF, social subsidies fund and voluntary scheme groups. The marginal effect and coefficient were positive, which mean that these three groups which utilized medical services from nearest health care facilities operated by NHIF, the relative probability of being insured would increase by 1.3 percent, 3.4 percent and 16 percent respectively in compare with never insured group, given other variables are held constant.

Legal dependent was statistically significant the coefficient and marginal effect were negative in NPF and voluntary scheme, the result shows that the number of legal dependents of the NPF and voluntary scheme groups the relative probability for being insured in NHIF would decrease by 2.8 percent and 1.1 percent respectively in compare with never insured group, given other variables are held constant.

While, the legal dependent of NSSF was statistically significant coefficient and marginal effect were positive, which mean the number of legal dependents of NSSF the probability of being insured in NHIF would increase by 1.5 percent in compare with reference group, given other variables are kept constant.

Chronic illness was statistically significant the coefficient and marginal effect were positive among NSSF and voluntary scheme program member, the relative probability of being insured in NHIF would increase by 10.2 percent and 7.1 percent respectively in compare with never insured group, given other variables are kept constant.

Number of visits was statistically significant at $P < 0.01$ the coefficient and marginal effect were negative, the result shows that the number of visits of the NPF members of medical consultation would decrease by 4.1 percent in compare with reference group.

While the number of visits was statistically significant the coefficient and marginal effect were positive, the result indicate that the number of visits of social subsidies fund more likely utilized health care services would increase by 4.9 percent relative to never insured group, given other variables are held constant.

Distance from nearest health facility is dummy variable (1= 5Km or less, 0= more than 5Km) the coefficient and marginal effect were positive and significant in NPF, the study shows that member of NPF who live 5Km or less from nearest health facilities the probability of insured in NHIF are higher by 12.4 percent respectively in compare to the reference group.

Satisfaction was statistically significant in both group NPF and social subsidy fund the coefficient and marginal effect were positive this finding indicate that the NPF and social subsidy member the relative probability of being insured would increase by 11.4 percent and 12.1percent respectively in compare with never insured group, given other variables are kept constant.

Knowledge was statistically significant in both group NPF and NSSF the coefficient and marginal effect were positive this finding indicate that the NPF and NSSF member

who have well knowledge about NHIF the relative probability of being insured would increase by 4 percent and 7.3 percent respectively in compare with reference group. Given other variables are kept constant.

Being Member of association, statistically significant the coefficient and marginal effect were positive this finding indicate that the social subsidy elderly households who are participating of any association the relative probability of being insured in NHIF would increase by 11.7 percent in compare with never insured group .Respected statistically significant the coefficient and marginal effect were positive this finding shows that the member of NPF group who are respected the relative probability of being insured in the scheme would increase by 3.2 percent in compare with reference group .

Having TV statistically significant in all insured groups , the coefficient and marginal effect were positive this finding shows that the member of NPF, NSSF, social subsidy fund and voluntary scheme groups. The relative probability of being access information and insured in NHIF would increase by 8 percent, 11.1 percent, 21.3 percent and 3.7 percent respectively in compare with never insured group, given other variables are kept constant.

Live in save housing statistically significant the coefficient and marginal effect were negative this finding shows that the member of social subsidy group who living in unsafe housing they have limited access information channels relative probability of being insured in NHIF decrease by 17.8 percent in compare with reference group.

The elderly household member of NSSF who Participating in decision making roll statistically significant the coefficient and marginal effect were positive this finding shows that the member of NSSF group relative probability of being insured in NHIF would increase by 6.3 percent in compare with never insured group, given other variables are kept constant.

6.2 Discussion:

The study tries to examine the main factors that affecting participation in National Health Insurance Fund among elderly households in Gedarif city –Sudan.

Study represent significant efforts to remove financial and social barriers to healthcare access for elderly people.

The health insurance status of the head of elderly household in this study is defined by five possible categories (never insured –insured through national pensioner fund, insured through national social security fund, insured through social subsidy program, and insured through voluntary scheme.

In this chapter we are going to discuss the main finding of the study by investigate the relationship between different five groups.

6.2.1. The impact of health status on participation in the scheme:

From previous study done by (Fentahun2, 2014.), health status of the elderly households measured by presence or absence of chronic illness among the respondents. Our descriptive analysis shows that 51% out of total respondents with chronic illness. 15.36 % from never insured group, 16.34% from NPF, 25.82% from NSSF, 16.99 % social subsidy fund and 25.49% from voluntary scheme program this result confirm that there are strong relationship between chronic illness and the participation on the NHIF in Gedarif city . Clearly from the result voluntary scheme and NSSF group had higher proportion of chronic illness compare with other groups, this finding indicate that the head households member from voluntary scheme and NSSF shows that most likely to be insured in the scheme . Moreover, both model A and B shows that there is significant relationship at 99% level with positive expected sign between health status and being insured in the NHIF through voluntary scheme and NSSF This fact shows health status of elderly households is one of the main determinant of participation in the scheme in Gedarif city , also this finding matched with study conducted in Ghana by (Anthony Kusi1, 2015) .

The study also confirms the hypothesis of the study which stated, health status of elderly households affects the participation in NHIF in Gedarif city.

Additionally, the study shows that 51 % from respondents have chronic diseases, this finding lead the scheme affected by adverse selection in which chronic disease group

join the NHIF whereas the healthier cannot participate in the scheme like study done by (KATHERINE BAICKER, 2012).

6.2.2. The impact of demographic factors:

The study focus on the following variables to reflect the demographics characteristic of participants which are: Age, gender, Marital status (dummy –married or otherwise) Education level (dummy – higher education or otherwise).

The mean age of the respondents is 66 years old, minimum age of respondent is 60 years old where maximum age is 98 years old. The outcome model B Shows that age are significant at 99% level with positive expected sign among the NPF in compare with never insured group, So any increasing in age of the head of elderly households would increase the probability of enrolment in the scheme like what found in the study of (Saupe, 1987). More over the result from binary Logit regression also confirms this fact, increase the age by one year the probability of insured in national health insurance would increase by 0.5%.

Marital status have no strong significant impact in the respondents, since it was significant at 90% level among NPF in both model when they compared to the reference group.

Also from descriptive analysis 88.5% from the total respondents are married, 7.17% Widows and 4.33 are divorced. This funding this study corresponded with previous study in Ghana done by (Kong, 2010) in USA which reported household married more likely to be insured in the scheme.

As expected our study found that, there is positive impact of education on participation in the health insurance , Education has positive sign and significant at 99% in both model among NPF .

This relationship was found in previous study done in Ghana and Senegal by (Parmar et al., 2014). Also study done by (Anderson, 1973) showed that education have positive impact on the enrolment in health insurance scheme , all this funding reflect that when the level of education increased the probability of enrolment also increase and the individuals more likely to be insured in the scheme.

Additionally, our result from binary logistic regression confirm this fact.

With regard to variable gender was significant in model A among NPF and voluntary scheme at 90% level and 99% level respectively with negative sign, while it is also

significant at 99% in model B in voluntary scheme. Only significant at 90% level in the binary logistic model.

The result indicate that being female is more likely to be insured in health insurance scheme, This result is consistent with the study conducted in Sudan by (Mustafa, 2013) in Sudan.

6.2.3. Impact of socioeconomics factor:

Our descriptive result shows that average monthly income 1510.96 where the average monthly food expenditure is 1244.96 SDG This result indicate that there is low Socioeconomic Status among elderly household and low financial Protection. This situation might increase the burden of financial and medical expenditure.

From the result of model A and model B Income is significant at 99% level with negative sign among, NSSF and social subsidy fund this finding reflect that the elderly households from these two group their monthly income is very low in compare with reference group , in addition the result of descriptive analysis confirm this result in table (6.5).

However, income has no significant impact among these two groups in term of participating in the scheme, because elderly households in this tow groups already they have sponsor pays their premium on behalf like Zakat fund, FMOH which pays for poor families, NSSF pay for retiree of NSSF.

6.2.4. The impact of nearest health facility on participation in NHIF:

The study used the dummy variable direct and indirect health care facilities to investigate the impact of health facility type on the enrolment in health insurance the result from descriptive study shows that 62.33 % from respondents preferred to access their health services from the health services operated by NHIF.

Also from multinomial regression result the variable health facility type was significant at 99% level in both model among whole insured groups with positive sign.

Result from binary Logit regression found that health facility type operated by NHIF increase the probability of enrolment by 18% compare with never insured group. This finds corresponded with study done in Sudan by (Mustafa, 2013) which state, more than 65 % of the patient utilized health services through direct health care center which are owned by NHIF .

Regarding the distance of nearest health facilities the study show that from descriptive analysis 81.17% from the participants live near the healthcare facilities. Also Variable distance significant in both model at 99% and 95% among NPF and NSSF respectively. this result also supported from binary Logit regression result which stated health facilities being near the household's residence the probability of being insured would increase by 7% compare with the households live from nearest health facility far more than 5Km. So, the availability of health care services increase the participation in the scheme like Study done in Ghana by (Peter Agyei-Baffour¹, 2013) confirms our study result, which revealed that the health facility being nearby those eligible to be participated in health insurance facilitated significantly their enrolment in health insurance scheme.

The NPF households' members exhibited low average number of visits regarding the never insured group, which is mainly attributed to relative large family size of never insured groups (Table 6-9). Thus, the effect of number of visits on the enrollment of NPF members was a significant negative co-efficient sign.

6.2.5. The impact of knowledge about the NHIF scheme:

Our study found that, 271 (45.2%) from the total respondents have very well knowledge about National Health Insurance Fund. whereas 329 (54.8) respondents have little or not have no knowledge about the scheme. The highest level of knowledge found among NPF group and NSSF group member which was 53.33 and 51.67 respectively.

Furthermore, the regression model shows that there was strong relationship between the knowledge and participating in scheme. This finding came up with (Hongman Wang, 2008) which state , increase the level of knowledge about the scheme will lead to motivate the participation mechanism.

6.2.6. Impact of perceived quality of the services:

Quality of health care services provided by health insurance played major role to increase or decrease the enrolment in the health insurance (Caroline Jehu-Appiah & Baltussen¹, 2011). Our study shows that 331 (55.17) respondents satisfied from the service provided by NHIF, whereas 269 (44.83) respondents dis-satisfied from the services. Among each group voluntary scheme program have the highest number of dis-satisfied members 65% followed by never insured group 58.33%.

The main causes of dis-satisfaction are long waiting time, low quality of services and unavailability of drug in the pharmacies.

The study also revealed that in both model, satisfaction is significant among NPF and social subsidy fund groups.

6.2.7. The impact of sociocultural variables

like study done in Ghana by (Parmar et al., 2014).our study shows that 127 respondents participated as a member of association. 113 members insured and 14 members not insured, most of insured members from social subsidy fund.

The study also revealed from model B the variable member is significant at 99% level with positive sign among social subsidy program. This finding indicate the member of any association among elderly households might increase the probability of enrolment in the scheme. Especially when the government introduce social protection program to insure the poor families like what found in Sudan through Zakat fund and FMOF.

Although this policy lead to increase the participation in scheme, but may reflect negative impact on selecting the real target households for different considerations. This fact has been revealed through the descriptive result when 25% of respondents mentioned that they were not selected to enroll in NHIF because of the local committee. The elderly households who felt that are respected more likely to be enrolled in the scheme. The variable respected is significant among NPF group with positive expected sign.

6.2.8. Impact Political variables:

Regarding political variables, our result show that the political dimension is an important determinant of enrolment in NHIF.

Have TV variable was significant at 90% level among whole insured groups with positive sign the result indicate there is no information barriers , thus all respondents can access information about scheme .

While, the variables living in safe housing and decision making role are significant among social subsidy and NSSF with negative sign among social subsidy and positive sign among NSSF.

The result show that social subsidy households member who live in an unsafe housing less likely to be enroll in the scheme due to the absence of health care center nearby their residence this finding corresponded with what found in (Parmar et al., 2014).

CHAPTER 7

Conclusion recommendation and limitation

In this the study, will discuss the following, conclusion of the result our analysis, the recommendation then the limitation of the study.

7.1 Conclusion:

Although of the exerted effort to cover all the citizens under the umbrella of National Health Insurance Fund, but, still there are low continuation enrollment of elderly people in Sudan. Thus, there is a big debate about factors affecting the continuation of elderly to enroll in NHIF. Therefore the main reason to conduct this study the challenges that face the National Health Insurance Fund in Gedarif state in expanding the coverage among elderly households. The researcher used Gedarif city as scope of this study due to presence of the different health insurance status.

The present study aimed to answer the questions related to elderly households' health insurance coverage. The study was carried over the reference period from May to June 2015, using 600 questionnaires completed by elderly households in Gedarif city.

Descriptive statistics analysis

Concerning the primary data the study found that:

Males represent the majority of respondents as a head of the households with (87.7%) age mean 66 years.

Most of the participants have married and represents about 88.5% from the total respondents.

The most frequent level of education was secondary, which represented by 29.67%, while the lower education level is university or higher represented about 20.33%.

In terms of occupation the majority of respondents were day labor represented by 40.67%, farmer 19.33%, whereas the rest of respondents are retirees of NPF and NSS.

The average monthly income was 1510.96SDG, where the average monthly food expenditure was 1244.96 SDG, while the average monthly health expenditure was 90SDG

The health status of the elderly households in term of chronic illness 51% from the elderly households member have chronic diseases, the most common chronic diseases were Diabetes and hypertension.

In terms of types of health facilities and health services accessibility, 62.33% respondents received their health services from facilities affiliated to NHIF. Regarding the distance from the nearest health facilities the study found 81.17% of participants received their primary health need from health facilities placed within less than 5 km. Perceiving quality of the services, the study revealed that 55.17% of respondents are satisfied with provider services, while 44.83% are not satisfied. The main reasons of dis-satisfied is long waiting time 46.1% , low quality of services 17.1% unavailability of services 16.73% , 5.2% bad attitude of medical staff , 5.2 % high cost of drug ,5.2% lack of laboratory investigation lastly 4.46 % inadequate staff.

The knowledge about the NHIF In terms of the aim of NHIF, the procedure of enrolment and the medical benefits package provided by the NHIF, the study found that 54.83 % of respondents have little or do not have knowledge about scheme, whereas 45.17% have very well knowledge about scheme.

The main significant feature of NPF group, the study finds that, they are more educated, less number of legal dependents, more satisfied from the services provided by NHIF, very well knowledge about NHIF.

For the NSSF group, they are more educated, have less legal dependents, infected with chronic illnesses, know well about NHIF, they have decision making role, believe they are respected.

For the subsidized group, the main significant feature were, they have low income more utilize the health services, satisfied from the health services provided, live in an un-safe housing.

Regarding voluntary scheme group, infected with chronic illness, less satisfied from the services, less educated

From results of multinomial regression, which was confirmed by binary regression we can conclude the result as follows:

The main factors that increase the participating in the scheme:

1. Knowledge about scheme
2. Accessibility of the health services
3. Exposing to advocacy information.
4. Health status of the household
5. The type of health facility, which might indicate the quality of services.

Social interactivity most likely to be enrolled.

7.2 Recommendations:

To expand the coverage of elderly households in Gedarif city, in terms of motivation of participation in national insurance fund, the study suggests the following:

1. The knowledge has influential effect on the enrolment in health insurance fund, thus health insurance fund has to set and conduct regular promotional activities to elevate the target group knowledge.
2. The accessibility and quality of health services revealed significant impact on enrolment of households in health insurance, expand of health services network is very important of expansion of umbrella, moreover the quality of services should critically considered, the National Health Insurance Fund facilities reflect the importance of quality on households enrolment.

7.3 Limitation of study:

The limitation of this study can be summarized in the following:

The study was focus in Gedarif city, so, it is difficult to generalize the outcome, therefore we need further studies should focus to examine these factors on the state level and National level because is difficult to determine the number of population of study and weight of each health insurance group therefore, sample size was calculated with recourse to Cochran (1977).

The sampling conducted not reflecting the proportions of study group distribution, that to avoid few number for some sub-group we oversampling them.

APPENDIX

APPENDIX A

Participation information sheet (English)

Household survey of elderly household in Gedarif city –Sudan

Thesis title: Factors affecting participation in national health insurance fund among the elderly households in Gedarif City –Sudan.

Researcher Name: Mr. Elwaleed Ahmed Eltoun

Position: I am student in the M.Sc. in Health Economics and Health Care Management programme, Faculty of Economics, Chulalongkorn University, Bangkok, Thailand.

Office address: NHIF Gedarif State

Home address: Karfiss neighborhood- block- No. 2 - Street 89

Telephone (office): 4342189

Cell phone 0918286399 **E-mail:** weli.72279@gmail.com

I would like to invite you to participate in my research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or would like more information. Take time to decide whether or not to take part.

This thesis consist questions about demographic, socioeconomic and health status of the elderly household. Besides, questions about sociocultural variables and political variables are also asked. Additionally, questions will be asked to explore the factors behind elderly households and their current health insurance status (Insured through NSSF, Insured through NPF, Insured through voluntary scheme, Insured through social subsidy fund, uninsured)

Thesis objectives: To identify the main factors influence the elderly households to enroll in NHIF in Gedarif city Eastern Sudan.

Characteristics of participants:

The target population consists of elderly households, defined as households in which the **household head** or his/her spouse is aged 60 or over.

Number of participants needed:

We need about 600 observations as minimum sample size to conduct this study, 120 observations for each of the categories, Insured through NSSF, NPF, voluntary scheme, social subsidy fund, or uninsured.

The rights of respondents:

Participation of this survey is voluntary, respondents have rights to withdraw at any time without given any reasons.

Why chose these segment of population?

We chose this segment of population because elderly household in Gedarif state Eastern Sudan because elderly household face large and uncertain medical expenditure without guarantee of public insurance coverage.

Risk from participant:

There is no expected risk from participant in this survey, the collected data will be kept confidential during the research process.

Benefits for participant and community:

The benefits of this study are directed to the elderly households in Gedarif state- Sudan by identify the main factors affecting the enrollment in health insurance. Accordingly NHIF will be able to implement the policy that lead to cover all elderly households in NHIF to access finance protection and eliminate uncertain medical expenditure.

Name.....		
Signature.....	Date.....	

Data collector name.....	date.....	Questionnaire NO.....
Locality.....	City.....	

1. How old is the head of the household (in completed years)?
2. How old is the spouse of the head of the household (in completed years)?

Interviewer: If the household head (or his/her spouse) is aged 60 or over, interview the household head. If less than 60 years old go to the next household. Also, if the household head is not available go to the next household.

3. What is the head of the household's gender? Male Female.
4. What is the highest educational level completed by the head of the household?
 Un- formal Primary Secondary University or higher.
5. What is the marital status of the head of the household?
 Married Single or Live alone Others, specify.....
6. What is the average monthly income of the head of the household? -----SDG
7. What is the average monthly income of the household? -----SDG
8. What is the employment status of the head of the household?
 Retiree from NSSF Retiree from NPF Farmer Day labor
 Others, specify.....
9. What is the type of household dwelling?
 Mud Hut Brick Other, specify.....

10. What is the main tenure status of this dwelling?

Owned Rented Other, specify-----

11. What is head of household's Main source of livelihood?

Pension Sale Crop farming Support from Zakat chamber
 Other, specify-----

12. What is your family's size? -----person/s

13. How many dependents are there in your family? (Number of legal dependents according to NHIF***)persons.

14. What is your household's size? -----person/s

15. What are your average monthly household expenditures? -----SDG

16. How much does this household spend on average on food per month? -----SDG

17. How much does this household spend on average on health care per year? -----SDG

18. Does any member of your family suffer from chronic illnesses (which are defined as long Term conditions which can be treated but not cured) and which include diabetes mellitus, Hypertension heart diseases, tuberculosis, asthma, renal problems, bone problem

Yes NO if yes specify members, Relationship with the household head and type of illness?

Household member	Relationship to the head of household	Type of chronic diseases
1.		
2.		
3.		
4.		
5.		
6.		

19. How many times did the household members seek for health services per month during the last three month? -----time.

20. What is the type of the nearest health facilities from your residence usually goes to?

❖ Primary health care Centre :

Direct provision In-direct provision Other, specify-----

❖ Hospital :

Direct provision In-direct provision Other, specify-----

21. What is distance of the nearest facility to your house?

1 Km or less 1-5 Km more than 5 Km

22. What type of transportation do you usually use to go to the facility mentioned above?

On foot By taxi Public transportation Others, specify-----
 1 Km or less 1-5 Km more than 5 Km

23. How much does it cost? -----SDG.

24. How long did the household members wait in the facility before being seen by the provider on average?

Less than 30 min from 30-60 min more than 60 min

25. Did the doctor prescribe any medication in the last visit for you or one of your house hold members?

Yes NO

26. If yes how many drug did you get from the total prescription? -----

27. Did the services provided by the facilities mentioned in question (20) satisfy you?

Yes NO

28. If no, what are the most important factor that cause dissatisfactions?

Interviewer: Read out loud the response options:

Staff attitude Long waiting time High cost of drug (co-payment)
 Inadequate staff Lack of drug in pharmacy Lack of laboratory investigation
 Low quality of service Other, specify-----

NOW I would like to assess your awareness and knowledge of health insurance:

29. Have you ever heard about NHIF?

Yes NO Interviewer: if yes, continue with question 30. If no, go to questions in part 2

30. What is the purpose of NHIF? -----

31. What are the procedures of enrollment in NHIF? -----

32. What is the services package provided by NHIF? -----

33. Are you insured in NHIF? Yes NO Interviewer: If no, go to question 41

34. If yes, insured through:

NPF NSSF social subsidy voluntary scheme

✦ Interviewer ask if insured as Dependent^{***} - if yes, ask:

Insured as dependent from your wife. Insured as dependent from your sons

Insured as dependent from your husband daughter's

35. For how long have you been insured in NHIF? -----month /year

36. If you are insured by NPF or NSSF how do you pay your premium?

As contribution deducted from the monthly pension NSSF bears all insurance

Premium NPF bears all insurance

37. If you insured through social subsidy, who pays the premium?

Subsidy from Zakat fund Subsidy from FMOF

38. If insured through voluntary scheme, have you continuously paid the premium?

Yes NO

39. Interviewer: If yes in question (33) continue: Why did you choose to enroll in NHIF?

High medical spending per year Large household size One of the household

Member has chronic illness or illness in general High quality of health insurance

Services I believe on the concept of NHIF Others, specify -----

40. IF no (in question (38)) what reasons lead you to drop out from the scheme?

Unaffordable to pay premium Quality of services is very bad

I did not get sick Medical package is not enough

None of my family get sick Health facilities is far from my residence

Quality of drug is not good Other, specify -----

41. If no insured in question (33) have you ever been insured through NHIF?

Yes NO Interviewer: If no go to question 44.

42. If yes which scheme did you belong to?

NSSF NPF Voluntary scheme Social subsidy scheme formal sector

43. When was the last time you belonged to scheme? -----/yea

Questions (44) for non-insured elderly households:

44. Why have you not enroll in NHIF?

- Don't know how to enroll in health insurance scheme? Am healthy
- I have no heard about the scheme ~~Financial~~ hardship
- Health facility is far from my residence
- Public local committee did not select me to enroll through social subsidy scheme
- Medical package is not enough ~~Other~~ specify-----

Part (2) sociocultural questions:

45. Do you member of any association like (social club-sport club-religious associations –women group)?

- yes NO

46. Does older people are respected these days?

- Strongly agree ~~Agree~~ Neutral Disagree strongly disagree

47. Do you need help with activity daily living such as walking, bathing and so on?

- Yes NO

Political questions:

48. Do you have TV or radio in your house?

- Yes NO

49. Do you living in the safe housing in your neighborhood and feel it is safe to walk alone in the night?

- Yes NO

50. Do you have any a decision making role in your community?

- Yes NO

51. In general, are you fully prepared to take risks or do you try to avoid risks?

Please circle the appropriate number on the scale below, where the value 0 means "risk averse" and 10 means "fully prepared to take risks" (i.e. like to take risks).

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Thanks for participating in this survey

- ☞ definition of dependent***: according to NHIF in Sudan the definition of legal dependents consist of :parents , the wife/s, the sons up to 18 years old, and unmarried daughters

APPENDIX B

Participation information sheet (Arabic)

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

إِسْتِئْذَانٌ تَعْطِيَةٌ (كِبَارِ السِّنِّ) بِمَدِينَةِ الْقَضَارِفِ

توضيح وإقرار للشخص المستطلع

ملحوظة: يجب استطلاع رب الأسرة فقط وتلويح إجابته حسب الأسئلة أدناه

عنوان هذا البحث: العوامل المؤثرة على الإشتراك في الصندوق القومي التأمين الصحي ولاية القضايف –دراسة حالة كبار السن بمدينة القضايف

اسم الباحث : الوليد احمد التوم عبد الرحمن

طالب ماجستير بجامعة جولوتكورن- تايلاند برنامج اقتصاديات الصحة وإدارة الرعاية الصحية

العنوان : التأمين الصحي ولاية القضايف : عنوان المنزل : كرفس مربع (2)

تلفون المكتب: 41480 : موبائل رقم : 0918286399

إيميل : weli72279@gmail.com

اطلب منك المشاركة في هذه الدراسة. وقبل ان تقرر في الإشتراك في هذه الدراسة نطلب منك فهم الاسباب التي دفعت الباحث للقيام بهذه الدراسة وماذا تعني مشاركتك فيها. لذلك نرجو منك اخذ الزمن الكافي لقراءات المعلومات أدناه يدقه ولك الحق في تقديم اي سؤال او استفسار عن اي معلومة غير واضحة او تريد مزيد من المعلومات الاضافية – اخذ كامل وقتك وبعدها قرر اذا ترغب في المشاركة ام لا.

هذا البحث يشتمل على اسئلة تتعلق بالجوانب الديمغرافية والاقتصادية والاجتماعية والحالة الصحية لاسر كبار السن بمدينة القضايف إلى جانب المتغيرات الثقافية والاجتماعية والسياسية في المجتمع بالإضافة لاسئلة تتعلق باكتشاف الجوانب الكافية وراء الحالة الصحية الراهنة لاسر كبار السن المؤمنين وغير المؤمنين بمدينة القضايف .

اهداف البحث: الهدف من هذا البحث هو معرفة العوامل والاسباب التي تؤثر على اشراك الاسر خاصة (كبار السن والمعاشين) في التأمين الصحي بولاية القضايف ويتم تمثيلها في هذا الاستبيان برب الأسرة.

خصائص المشاركين: السكان المستهدفين في هذا البحث اسر كبار السن والتي تتالف من واحد او اكثر من شخص ، واحد منهم على الأقل عمره 60 عام او اكثر.

حقوق المشاركين : المشاركة في هذا الاستطلاع اختياري لذا المشاركة له الحق في الانسحاب من هذا الاستطلاع في اي وقت يشاء دون تقديم اي اسباب.

لماذا اختار الباحث هذه الشريحة من المجتمع: تم اختيار هذه الشريحة من المجتمع لان هذه الشريحة اكثر عرضة للمرض خاصة الامراض المزمنة وتعاني ايضا من النفقات الطبية المتزايدة لذا تتطلب توفير الحماية سوي كانت هذه الحماية طبية او مالية.

مخاطر المشاركة في هذا الاستطلاع: لا توجد اي خاطر بالنسبة للمشاركين في هذا البحث وسوف تظل المعلومات المقدمة من جانب المشارك في سرية تامة أثناء عملية البحث.

الفوائد التي تعود على المشاركين والمجتمع : الفوائد المتوقعة لسكان ولايه القضايف بصورة عامة و كبار السن بصفة خاصة : تحديد العوامل الرئيسية التي تؤثر على الإشتراك في التأمين الصحي اذا تساعد متخذ القرار في التأمين الصحي لتبني وتنفيذ السياسات التي تساهم في زيادة التغطية بالولاية وتوفير الحماية الطبية لكبار السن .

بيانات الطيار:

الاسم:

التاريخ:

اسم جامع البيانات: التوقيع: التاريخ: رقم الاستبيان:

العنوان: المدينة: الحي:

1. كم يبلغ عمر رب هذه الأسرة ؟

2. ما هو عمر زوجة /زوج ارب هذه الأسرة ؟

(انا كان عمر رب الأسرة او الزوج/الزوجة 60 عام فلكثر طي المستطلع مواصلة الاستطلاع مع رب الأسرة ، اما اذا كان أقل من 60 عام او رب الأسرة غير متاح في زمن العقبلة طي المستطلع الذهاب إلي أسرة اخرى).

3. ما نوع رب هذه الأسرة ؟ ذكر أنثى

4. ما هو المستوى التعليمي لرب الأسرة؟

 لم يتلقى اي تعليم حكومي امان ثانوي عالي جامعي او فوق الجامعي

5. ما هي الحالة الاجتماعية لرب الأسرة ؟

 متزوج عازب او ساكن وحيد اخرى حدد

6. ما هو متوسط الدخل الشهري لرب الأسرة؟ جنيهه سوداني

7. ما هو متوسط الدخل الشهري للأسرة؟ جنيهه سوداني

8. ما هو الوضع الوظيفي الحالي لرب الأسرة؟

 معاشي تكافئ اجتماعي معاشي صندوق قومي للمعاشات مزارع اعمال حرة أخرى حدد

9. ما نوع السكن الحالي للأسرة ؟

 طوب اخضر قطية طوب مسلح اخرى حدد

10. ما نوع الملكية لهذا المنزل ؟

 ملك حر إيجار أخرى حدد

11. ما نوع مصدر الرزق الاساسي لرب هذه الأسرة ؟

 معاش شهري بيع فائض منتجات المحاصيل الزراعية دعم من ديوان النكاة اخرى حدد

12. ما هو عدد أفراد اسرتك الذين تعولهم ؟/شخص
13. ما هو عدد المعالين في هذه الاسره حسب قانون التأمين الصحي؟.....شخص
14. ما هو حجم اسرتك؟...../شخص
15. ما هو متوسط الانفاق الشهري للأسرة؟.....جنيه سوداني.
16. ما هو متوسط الانفاق الشهري لتاكل والشرب بالنسبة للأسرةجنيه سوداني
17. ما هو متوسط الانفاق الشهري علي الصحة للأسرة؟.....جنيه سوداني
18. هل هناك اي فرد من افراد الاسرة يعاني من مرض مزمن ؟ مثل (سكري-ضغط الدم- قلب-سل-ازيماء- امراض الكلي- امراض عظام)

(إذا كانت الاجابة بنعم حدد عدد الافراد ونوع العلاقة مع رب الاسرة ونوع المرض)

اسماء افراد الاسرة الذين يعانون من مرض مزمن	نوع العلاقة برب الاسرة	نوع المرض
1.		
2.		
3.		
4.		
5.		
6.		
7.		

19. كم عدد المرات التي احتاج فيها افراد الاسرة علي الخدمات الطبية في اخر ثلاث اشهر؟.....مرات

20. ما هو نوع اقرب مرفق صحي لمكان سكن الاسرة؟اسم المرفق

مركز صحي يتبع له: التأمين الصحي وزارة الصحة اخري حدد.....

مستشفى يتبع له: التأمين الصحي وزارة الصحة اخري حدد.....

21. كم تبعد المسافة من منزلك إلي اقرب مرفق صحي بالكيلو مترات تقريبا؟

اقل من واحد كيلو متر بين واحد وخمسه كيلو مترات أكثر من خمسة كيلو مترات

22. ما هي وسيلة العواصلات التي تستخدمها دائما للوصول للمرفق الصحي حاله

تاكسي مواصلات عامة بالارجل اخري حدد.....

23. كم تبلغ تكلفة المواصلات حاله؟.....جنيه سوداني

24. كم متوسط فترة الانتظار التي يستغرقها افراد الاسرة لحين تلقي الخدمة الطبية بالمرفق الصحي ؟

اقل من 30 دقيقة بين 30-60 دقيقة أكثر من 60 دقيقة

25. هل الطبيب المعالج في المرفق الصحي وصف اي علاج لك او ل احد افراد اسرتك خلال اخر زيارة للمرفق الصحي؟

نعم لا

26. إذا كانت الإجابة بنعم كم عدد الأدوية التي وجدتھا بالصيدلية من جملة عدد الأدوية الموصوفة؟-----
27. هل أنت راضي عن الخدمة المقدمة في العرفق الصحي المذكور في السؤال رقم (20) الذي تتعالج فيه أنت وأسرتك ؟
- نعم لا
28. إذا كانت الإجابة بلا ماهي العوامل الأكثر احتمالاً من عدم رضاك عن الخدمة المقدمة من العوامل المذكورة أثناء؟
- معاملة غير جيدة من قبل العاملين بالمرفق الصحي طول فترة الانتظار بالمركز الصحي
- ارتفاع تكلفة ريع القيمة عدد العاملين بالمرفق الصحي غير كافي لتقديم الخدمة الطبية
- عدم توفر الأدوية بالصيدلية التشخيص غير دقيق في العرفق الصحي ضعف جودة الخدمة الطبية المقدمه
- عوامل أخرى حدها -----
29. هل سمعت بالتأمين الصحي من قبل؟ نعم لا (إذا كانت الإجابة بنعم على المستطلع الاستمرار من السؤال 30)
30. ما هو الهدف من الاشتراك في التأمين الصحي؟-----
31. ما هي الإجراءات المتبعة ذاتشراك في التأمين الصحي؟-----
32. ما هي حزمة الخدمات الطبية التي يقدمها التأمين الصحي؟-----
33. هل أنت مؤمن في التأمين الصحي؟ إذا كانت الإجابة بلا على المستطلع الذهاب إلى السؤال رقم(41)
- نعم لا
34. إذا كنت مؤمن ، هل أنت مؤمن بواسطة
- الصندوق القومي للمعاشات صندوق التأمين الاجتماعي شرائح الدعم الاجتماعي التأمين الحر
- المستطلع يسأل رب الأسرة هل أنت مؤمن كمستفيد من احد اقربائك ؟ إذا كانت الإجابة بنعم يواصل السؤال هل أنت مؤمن مستفيد من ؟
- زوجتك زوجك ابنك ابنتك
35. منذ متى وانت مؤمن في التأمين الصحي؟-----شهر-----سنة
36. إذا كنت مؤمن من قبل الصندوق القومي للمعاشات او التأمين الاجتماعي كيف تسد اشتراكات التأمين الصحي ؟
- مساهمة تستقطع من معاشي يتحمل الصندوق القومي للتأمين الاجتماعي سداد كل الاشتراكات
- تتحمل وزارة المالية الاتحادية سداد كامل الاشتراكات
37. إذا كنت مؤمن من قبل شرائح الدعم الاجتماعي من الذي يسد لك الاشتراكات ؟
- ديوان النكلا المالية الاتحادية
38. إذا كنت مؤمن من قبل التأمين الحر هل أنت مستمر في سداد الاشتراكات ؟
- رب الأسرة : نعم لا

39. اذا كان مؤمن في السؤال رقم (33) لماذا اخترت الاشتراك في التأمين الصحي ؟

- ارتفاع تكلفة العلاج في العام كبر حجم الأسرة احد افراد الأسرة يعاني من مرض مزمن
 وجود المرض بين افراد الأسرة بصورة عامة. زوجتي حامل وتحتاج لعملية جراحية في كل مرة
 جودة الخدمة الطبية المقدمة من قبل التأمين الصحي أو من برسالة التأمين الصحي
 اخرى حدد-----

40. اذا كنت لا تسدد اشتراكات التأمين الحر في السؤال (38) ما هو السبب الذي جعلك تتساقط من التأمين الحر؟

- غير قادر على سداد الاشتراكات الخدمات الطبية المقدمة غير جيدة الأسرة بصحة جيدة
 حزمة الخدمات المقدمة غير كافية كل افراد الأسرة اصحاء مناقذ تقديم الخدمة بجيدة من مكان سكني
 الادوية غير جيدة اخرى حدد-----

41. اذا كنت غير مؤمن في السؤال رقم (33) هل سبق لك الاشتراك في التأمين الصحي من قبل ؟

رب الأسرة : نعم لا (المستطع إن كانت الإجابة بلا يذهب للسؤال رقم (44)

42. اذا كانت الإجابة بنعم في اي قطاع من قطاعات التأمين الصحي انذاك كنت مؤمن عليه ؟

- الصندوق القومي للمعاشات صندوق التأمين الاجتماعي شرائح الدعم الاجتماعي التأمين الحر
 القطاع العام

43. ماهي اخر فترة كنت مؤمن عليه في التأمين الصحي؟-----بينة

السؤال (44) لخبر المؤمن عليه :

44. لماذا لم تشترك في التأمين الصحي؟

- لا اعلم. كيف اشترك في التأمين الصحي انا واسرتي بصحة جيدة لم اسمع من قبل بالتأمين الصحي
 لدي مشاكل مالية المرافق الصحية بعيدة من مكان سكني
 لم يتم اختياري من قبل اللجان الشعبية للاشتراك في التأمين الصحي ضمن شرائح الدعم الاجتماعي
 الخدمة الطبية المقدمة من قبل التأمين الصحي غير كافية اخرى حدد-----

45. هل انت عضو في اي جمعية اجتماعية مثل (الائنية الاجتماعية-الائنية الرياضية-جمعية دينية-جمعية نسوية)؟

نعم لا

46. هل تعتقد بان كبار السن ينالون الاحترام والتقدير في هذه الايام؟

اوافق بشده اوافق محايد لا اوافق لا اوافق بشده

47. هل تعتقد بان كبار السن يحتاجون للمساعدة في انشغله الحياة اليومية مثل المشي لوحدهم -الحمام- الي اخره

نعم لا

48. هل لديك تلفزيون او راديو في المنزل لتتلقى الاخبار اليوميه؟

نعم لا

49. هل لديك مسكن امن في الحي الذي تسكن فيه وتحس بالامان عند الخروج لوحده؟

نعم لا

50. هل لديك اي دور في اتخاذ القرارات في المجتمع من حولك؟

نعم لا

51. هل انت علي استعداد لتحمل المخاطر(كالمخاطر الصحية او جميع المخاطر) او تجنب تلك المخاطر ؟

يرجى وضع دائره حول الشكل اثناء حيث:

القيمة (0) تحني تجنب المخاطر والقيمة (10) تحني علي استعداد تام لتحمل المخاطر

0	1	2	3	4	5	6	7	8	9	10
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شكرا جزيلاً علي مشاركتك في هذا الاستطلاع

*** (المستفيد/المعالج) في قانون التأمين الصحي يشمل : الوالدين، الأبناء الذكور اقل من 18 عام، البنات غير المتزوجات



APPENDIX C

Correlation table: model (A)

	HI status	HH Age	gender	Education	Marital	income	Facility	Legal de	Chronic	visits	Distance	
HI status	1											
HH Age	0.0261	1										
gender	-0.0394	0.1562	1									
education	-0.066	-0.245	0.0101	1								
Marital status	-0.0443	-0.0169	0.4527	0.0784	1							
Income of HHS	0.0025	-0.1927	0.1396	0.2448	0.1324	1						
Facility type	0.2967	0.0214	0.0327	-0.0069	0.0217	-0.0464	1					
Family size	-0.0065	-0.1855	0.0856	-0.047	0.1732	0.166	0.052	1				
Chronic illness	0.1509	-0.0042	0.0582	0.0667	0.0856	0.1532	0.05	-0.0044	1			
visits	0.1629	-0.0676	-0.0158	0.0044	0.0665	0.1978	0.0062	0.1964	0.4712	1		
Distance	0.0693	-0.0349	0.0267	0.0384	0.0134	-0.0161	0.2414	0.0086	-0.0202	-0.0385	1	
satisfaction	-0.0758	0.0414	-0.0324	0.057	-0.0203	-0.0188	0.0393	-0.0711	0.0147	-0.0497	0.0972	
Knowledge	0.0047	-0.1528	0.096	0.2311	0.0752	0.2632	-0.0202	0.0162	0.1728	0.1461	-0.0511	
	Satisfaction		knowledge									
Satisfaction	1.0000											
Knowledge	0.0640		1.0000									

APPENDIX D

Correlation table: model (B)

	HI status	HH Age	gender	Education	Maritals	income	Facility	dependen t	chroni c	visits	Distance
HI status	1										
HH Age	0.0261	1									
gender	-0.0394	0.1562	1								
education	-0.066	-0.245	0.0101	1							
Marital status	-0.0443	-0.0169	0.4527	0.0784	1						
Income of HHS	0.0025	-0.1927	0.1396	0.2448	0.1324	1					
facility type	0.2967	0.0214	0.0327	-0.0069	0.0217	-0.0464	1				
Dependent	-0.0065	-0.1855	0.0856	-0.047	0.1732	0.166	0.052	1			
Chronic illness	0.1509	-0.0042	0.0582	0.0667	0.0856	0.1532	0.05	-0.0044	1		
visits	0.1629	-0.0676	-0.0158	0.0044	0.0665	0.1978	0.0062	0.1964	0.4712	1	
Distance	0.0693	-0.0349	0.0267	0.0384	0.0134	-0.0161	0.2414	0.0086	-	-	1
satisfaction	-0.0758	0.0414	-0.0324	0.057	-0.0203	-0.0188	0.0393	-0.0711	0.0202	0.0385	0.0972
Knowledge	0.0047	-0.1528	0.096	0.2311	0.0752	0.2632	-0.0202	0.0162	0.1728	0.1461	-0.0511
member	0.1644	-0.1467	-0.0042	0.1836	-0.0051	0.1715	0.0744	0.0431	0.2141	0.118	0.02
respected	-0.1103	-0.1038	-0.0314	0.141	0.0923	-0.0206	-0.0684	0.0299	0.0019	-	0.0305
Need help	0.0187	-0.0289	-0.0011	0.1519	0.068	0.0713	-0.0197	0.0776	0.0517	0.0108	0.0554
Safe housing	-0.0126	-0.1492	-0.0181	0.2683	0.0631	0.229	0.0123	0.0312	0.17	0.138	0.0019
Decision	0.0713	-0.1461	0.0948	0.168	0.0465	0.2625	-0.0374	0.1255	0.1258	0.138	-0.0375
satisfaction	1										
Knowledge	0.064	1									
member	0.0487	0.2348	1								
respected	0.1034	-0.0184	-0.0347	1							
Need help	0.0879	0.0865	0.0757	0.1701	1						
Safe housing	0.0644	0.2711	0.166	0.11	0.1625	1					
decision making	-0.0002	0.2586	0.3022	0.039	0.0337	0.2254	1				

APPENDIX E**Multinomial logistic regression**

Log likelihood = -722.5498
 Number of obs = 600
 LR chi2 (48) = 486.23
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.2518

1/ (NPF) : model (A)

Health insurance	Coef	Std.Err	Z	P> z	M.effect2
HH Age	0.027394	0.023588	1.16	0.246	0.0015539
gender	-0.81445	0.560742	-1.45	0.146	-0.0145596
education	1.045846	0.319486	3.27	0.001***	0.0166856
Marital status	0.499635	0.515653	0.97	0.333	-0.0239022
Income of HHS	-0.00145	0.000252	-5.75	0.0000***	-0.0001634
Facility type	1.243189	0.307118	4.05	0.0000***	-0.0023814
Legal dependent	-0.12863	0.064963	-1.98	0.048**	0.0044208
Chronic illness	1.08112	0.335592	3.22	0.001***	0.1102126
visits	0.127066	0.113502	1.12	0.263	0.0131085
Distance	0.565067	0.349744	1.62	0.106	-0.0156004
satisfaction	0.377263	0.292983	1.29	0.198	-0.0080536
Knowledge	0.985905	0.317673	3.1	0.002***	0.0926862
_cons	-2.14321	1.723062	-1.24	0.214	

2. (NSSF) : model (A)

Health insurance	co.ef	Std.Err	Z	P> z	M effect
HH Age	0.044825	0.028652	1.56	0.118	0.002811
gender	-1.17154	0.622142	-1.88	0.06*	0.0430625
education	3.342593	0.433665	7.71	0.0000***	0.2623506
Marital status	2.41514	0.682972	3.54	0.0000****	0.1920092
Income of HHS	-9.5E-05	0.000172	-0.55	0.582	0.0000427
Facility type	1.017865	0.350099	2.91	0.004****	0.0302443
Legal dependent	-0.45459	0.094304	-4.82	0.0000***	-0.032309
Chronic illness	0.380291	0.397456	0.96	0.339	0.0185019
visits	-0.39775	0.14916	-2.67	0.008*	0.0474649
Distance	2.054309	0.537717	3.82	0.0000***	0.159263
satisfaction	1.425401	0.349352	4.08	0.0000***	0.1224911
Knowledge	0.645516	0.354907	1.82	0.069*	0.0194581
_cons	-6.76852	2.280017	-2.97	0.03	

(3)Social protection: model (A)

HI status	co.ef	Std.Err	Z	P	M. effect
HH Age	0.008972	0.023863	0.38	0.707	0.0015147
gender	-0.50469	0.564474	-0.89	0.371	0.0335579
education	0.313337	0.322669	0.97	0.332	-0.0936158
Marital status	-0.00116	0.507811	0	0.998	-0.0972991
Income of HHS	-0.0009	0.000212	-4.25	0.0000***	-0.0000605
Facility type	1.555841	0.308102	5.05	0.0000***	0.0618078
Legal dependent	-0.05409	0.058498	-0.92	0.355	0.0146499
Chronic illness	-0.05082	0.327899	-0.15	0.877	-0.0946813
visits	0.339857	0.108999	3.12	0.002***	0.0485313
Distance	0.650204	0.363508	1.79	0.074**	0.0140509
satisfaction	0.870636	0.291132	2.99	0.003***	0.0906809
Knowledge	0.386206	0.319353	1.21	0.227	-0.0139749
_cons	-1.83738	1.724108	-1.07	0.287	

(4)voluntary scheme: model (A)

health insurance	co.ef	Std.Err	Z	P	Effect
HH Age	0.018018	0.025044	0.72	0.472	-0.00015
gender	-1.26651	0.573369	-2.21	0.027	-0.08753
education	0.680163	0.318227	2.14	0.033	-0.05172
Marital status	0.809598	0.545508	1.48	0.138	0.020377
Income of HHS	0.00019	0.000135	1.41	0.159	0.000107
Legal dependent	-0.21717	0.067021	-3.24	0.001***	-0.00931
Chronic illness	0.927278	0.333577	2.78	0.005**	0.074762
visits	-0.00964	0.111538	-0.09	0.931	-0.0056
Facility type	2.206073	0.333247	6.62	0.0000***	0.165022
Distance	0.24357	0.35526	0.69	0.493	-0.06694
satisfaction	-0.53464	0.297952	-1.79	0.073*	-0.15148
Knowledge	0.256935	0.321073	0.8	0.424	-0.03123
_cons	-2.22958	1.803834	-1.24	0.216	

Multinomial logistic regression

Number of obs = 600
 LR chi2 (68) = 577.86
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.2992

Log likelihood = -676.73198

1/ (NPF) : model (B)

health insurance	co.ef	Std.Err	Z	P	M.effect
HH Age	0.074338	0.031431	2.37	0.018	0.003476
gender	-0.90261	0.670159	-1.35	0.178	-0.01865
education	3.014377	0.457875	6.58	0	0.218171
Marital status	2.17295	0.73305	2.96	0.003	0.147705
Income of HHS	-0.00017	0.000194	-0.89	0.372	4.13E-05
Legal dependent	-0.46815	0.098785	-4.74	0	-0.02814
Chronic illness	0.167205	0.43071	0.39	0.698	-0.01951
visits	-0.36904	0.158191	-2.33	0.02	-0.04107
Facility type	1.144319	0.376794	3.04	0.002	-0.02297
Distance	1.73112	0.553501	3.13	0.002	0.123886
satisfaction	1.640896	0.380654	4.31	0	0.113794
Knowledge	0.71442	0.385583	1.85	0.064	0.039959
member	-0.26574	0.514	-0.52	0.605	-0.07061
respected	0.469726	0.177581	2.65	0.008	0.032027
Need help	-0.04979	0.819217	-0.06	0.952	-0.04071
Have TV	2.3512	0.695879	3.38	0.001	0.079598
safe housing	0.7186	0.705629	1.02	0.308	0.081254
Decision making role	-0.4329	0.461322	-0.94	0.348	-0.0704
_cons	-12.5885	2.805982	-4.49	0	

NSSF) : model (B)

health insurance	co.ef	Std.Err	Z	P	M.effect
HH Age	0.046925	0.02487	1.89	0.059**	0.001631
gender	-0.73707	0.590216	-1.25	0.212	-0.01623
education	0.765421	0.337954	2.26	0.024***	0.004578
Marital status	0.43736	0.551912	0.79	0.428	-0.02814
Income of HHS	-0.00159	0.000266	-5.98	0.0000***	-0.00016
Legal dependent	-0.1633	0.0681	-2.4	0.016***	0.000167
Chronic illness	0.861864	0.357127	2.41	0.016***	0.102953
visits	0.13843	0.118512	1.17	0.243	0.010586
facility type	1.391118	0.323701	4.3	0.0000***	0.013222
Distance	0.450796	0.363322	1.24	0.215	-0.00438
satisfaction	0.450774	0.311701	1.45	0.148	-0.02319
Knowledge	0.713257	0.33576	2.12	0.034***	0.072528
member	0.533935	0.448118	1.19	0.233	0.005567
respected	0.320725	0.146909	2.18	0.029***	0.033022
Need help	0.881232	0.611111	1.44	0.149	0.095489
Have TV	0.9751	0.407585	2.39	0.017***	-0.11106
Safe housing	0.299462	0.45823	0.65	0.513	0.086804
Decision making role	0.645737	0.386007	1.67	0.094*	0.063195
_cons	-6.10572	2.011355	-3.04	0.002	

3. social subsidy fund : model (B)

health insurance	co.ef	str. Err	Z	P	M.effect
HH Age	0.031223	0.026426	1.18	0.237	-0.00063
gender	-0.37494	0.617754	-0.61	0.544	0.040219
education	0.031507	0.353036	0.09	0.929	-0.08857
Marital status	0.009212	0.563123	0.02	0.987	-0.07775
Income of HHS	-0.00104	0.000225	-4.64	0.0000****	-6E-05
Legal dependent	-0.0352	0.063862	-0.55	0.581	0.017376
Chronic illness	-0.46147	0.359079	-1.29	0.199	-0.1154
visits	0.417193	0.116362	3.59	0.0000***	0.04906
Facility type	1.549818	0.332884	4.66	0.0000****	0.034063
Distance	0.377545	0.391755	0.96	0.335	-0.00289
satisfaction	1.286927	0.327191	3.93	0.0000***	0.121289
Knowledge	0.061156	0.353459	0.17	0.863	-0.03193
member	1.293937	0.451606	2.87	0.004***	0.116645
respected	-0.07458	0.138612	-0.54	0.591	-0.02852
Need help	0.160377	0.529116	0.3	0.762	-0.03006
Have TV	2.932324	0.484545	6.05	0.0000***	0.212758
Safe housing	-1.39783	0.431732	-3.24	0.001***	-0.17815
Decision making role	0.474336	0.394325	1.2	0.229	0.023475
_cons	-4.68481	2.05757	-2.28	0.023	

(4)voluntary scheme: model (B)

health insurance	co.ef	str.Err	Z	P	M.effect
HH Age	0.040125	0.026571	1.51	0.131	0.000503
gender	-1.23548	0.605279	-2.04	0.041**	-0.09551
education	0.490573	0.334998	1.46	0.143	-0.04278
Marital status	0.847252	0.579216	1.46	0.144	0.036228
Income of HHS	4.23E-05	0.000146	0.29	0.772	0.0001
Legal dependent	-0.23671	0.07007	-3.38	0.001***	-0.01118
Chronic illness	0.702876	0.351766	2	0.046**	0.071057
visits	0.01858	0.115891	0.16	0.873	-0.0071
Facility type	2.29043	0.347411	6.59	0.0000***	0.160723
Distance	0.115271	0.369844	0.31	0.755	-0.05834
satisfaction	-0.31548	0.315433	-1	0.317	-0.14169
Knowledge	0.007888	0.336305	0.02	0.981	-0.044
member	0.590579	0.429496	1.38	0.169	0.019402
respected	-0.00255	0.133931	-0.02	0.985	-0.02091
Need help	0.442023	0.556407	0.79	0.427	0.021673
Have TV	1.820553	0.478348	3.81	0.0000***	0.037131
Safe housing	-0.31454	0.461985	-0.68	0.496	-0.02111
Decision making role	0.408743	0.380186	1.08	0.282	0.024713
_cons	-5.05132	2.081214	-2.43	0.015	

Appendix F



NO/NHIF/rd/TC/2015

Date 17/06/2015

Certification

This is to certify that the National Health Insurance Fund is accepting the request of **Mr : Elwaleed ahmed Eltoum Abdelrahman** from the **Chulalongkorn University** to undertake these study entitled (**Factors affecting participation in National health insurance fund among elderly households in Gedarif city – Sudan**) to be carried in Sudan.



Abdalla
Prof. Abdalla Elkhawad
Chair of committee

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VITA

Author : Elwaleed Ahmed Eltoun
Country : Sudan
Nationality : Sudanese
Education : Bachelor of economics
High Diploma in Public Management
Experience : Manager in Population Coverage since 2000 to now.
Address : Gadarif State – Health Insurance

