DETERMINANTS OF PHYSICIAN SERVICES UTILIZATION AMONG PUBLIC INSURED ELDERLY IN CHILE

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ปัจจัยกำหนดการใช้บริการทางการแพทย์ของผู้สูงอายุ ที่ได้รับการประกันสุขภาพโดยรัฐในประเทศชิลี

นางเจนิส มิเชล กอนซาเลซ กูเตียร์เรซ

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เจนิส มิเชล กอนซาเลซ กูเตียร์เรซ: ปัจจัยกำหนดการใช้บริการทางการแพทย์ของผู้สูงอายุ ที่ได้รับการประกันสุขภาพโดยรัฐในประเทศชิลี. (DETERMINANTS OF PHYSICIAN SERVICES UTILIZATION AMONG PUBLIC INSURED ELDERLY IN CHILE)อ. ที่ปรึกษาวิทยานิพนธ์หลัก : รศ. ดร. วรเวศม์ สุวรรณระดา, 74 หน้า.

จากการประมาณการล่าสุดพบว่า ประชากรสูงอายุในประเทศชิลีคิดเป็นร้อยละ26 ของประชากรทั้งหมด โดยกลุ่มผู้สูงอายุเป็นกลุ่มหลักที่มีการใช้บริการทางสาธารณสุข ดังนั้นรัฐบาลชิลีจึงได้จัดบริการทางสาธารณสุขของรัฐให้กับกลุ่มประชากรสูงอายุโดยเป็นบริการที่ไม่เสียค่าใช้จ่าย อย่างไรก็ตามกลับพบว่าในปี 2549 มีเพียงร้อยละ 44 ของประชากรสูงอายุที่ใช้บริการทางสาธารณสุขที่จัดให้โดยรัฐ

การศึกษานี้มีวัตถุประสงค์เพื่อที่จะศึกษาปัจจัยที่มีผลต่อการใช้บริการทางการแพทย์ที่จัดให้โดยรัฐบาลในกลุ่มประชากรผู้สูงอายุในประเทศชิลีและวิเคราะห์ปัจจัยที่มีผลต่อการใช้บริการทางการแพทย์ระหว่างของรัฐและเอกชนในกลุ่มตัวอย่างเดียวกัน

การศึกษานี้ทำในกลุ่มตัวอย่างผู้สูงอายุจำนวน 2,281 คนโดยทำการสุ่มตัวอย่างจากการสำรวจ Social Protection Survey ในปี 2549 โดยทำการเลือกปัจจัยที่ส่งผลต่อการใช้บริการทางสาธารณสุขที่นำมาวิเคราะห์จากทฤษฎีปัจจัยที่มีผลต่อการใช้บริการทางสุขภาพของแอนเดอร์เซนและนำมาปรับให้สอดคล้องกับลักษณะของประเทศชิลี จากนั้นทำการวิเคราะห์ข้อมูลโดยใช้แบบจำลอง logistic โดยมีตัวแปรตามในแบบจำลองแรกคือการใช้หรือไม่ใช้บริการทางการแพทย์ และตัวแปรในแบบจำลองที่สองคือ การใช้บริการทางการแพทย์ของรัฐหรือของเอกชน

ผลการศึกษาพบว่าตัวแปรที่มีผลต่อการใช้บริการทางการแพทย์อย่างมีนัยสำคัญทางสถิติคือ เพศ, การมีระดับการศึกษาสูง การอาศัยอยู่ในภูมิภาคที่ 7 9 และ 10 การรับรู้สภาวะสุขภาพของตนเอง การมีภาวะโรคเรื้อรัง และการมีภาวะพึ่งพาในชีวิตประจำวัน ในขณะที่ตัวแปรที่มีผลต่อการใช้บริการทางการแพทย์ของรัฐหรือเอกชนอย่างมีนัยสำคัญทางสถิติคือ เพศ การมีระดับการศึกษาสูง ระดับรายได้จากบำนาญ การอาศัยอยู่ในภูมิภาคที่ 5, การรับรู้ถึงสภาวะสุขภาพที่ไม่ดีของตนเอง และการมีภาวะโรคเรื้อรัง

ผลการศึกษานี้บ่งชี้ว่าปัจจัยทางด้านเศรษฐกิจและสังคมมีความสัมพันธ์กับการใช้บริการทางด้านสุขภาพ ดังนั้นแล้วผู้กำหนดนโยบายและผู้ให้บริการทางสุขภาพจึงควรคำนึงถึงคุณลักษณะของแต่ละบุคคลในการวางแผนการจัดบริการทางสุขภาพให้แก่ผู้สูงอายุ

สาขาวิชา เศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ ลายมือชื่อนิสิต.....

ปีการศึกษา 2552 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

5285587729: MAJOR HEALTH ECONOMICS AND HEALTH CARE MANAGEMENT
KEYWORDS: DETERMINANTS / PHYSICIAN SERVICES / UTILIZATION / ELDERLY/CHILE

JANISS GONZALEZ: DETERMINANTS OF PHYSICIAN SERVICES UTILIZATION AMONG PUBLIC INSURED ELDERLY IN CHILE. THESIS ADVISOR: ASSOC. PROF. WORAWET SUWANRADA, Ph.D., 74 pp.

Recent estimations have established that elderly population in Chile account for 26% of the population. Elderly are main consumers of health services and are considered as a vulnerable sector of the society. For that reason, since the year 2004, Chilean government has provided health services free of charge to the elderly beneficiaries of the public insurance when they use public sector services. Despite this policy, in the year 2006 only 44% of the elderly have used physician services from the public sector when they needed physician services.

The objective of the study was to identify the determinants of physician services utilization by elderly beneficiaries of the public insurance system in Chile and to analyze the determinants of private versus public physicians' utilization among this same group.

For the previous purpose, a sample of 2,281 elderly beneficiaries of the public insurance was taken from the Social Protection Survey 2006. The factors that determine health services utilization where selected from Andersen's Model of Individual Determinants of Health Services utilization and were modified accordingly to the Chilean reality. Two logistic models where estimated. One used as dependent variable the use or non-use of physician services. The second used as dependent variable the use of private versus public physicians.

As significant variables of physician services utilization were found sex (being female), high educational level, residing in the 7th, 9th and 10th region of the country, own perception of health status, diagnoses of chronic conditions and dependency in daily life activities. As significant variables in the use of private versus public physicians were found being female, having a high educational level, the amount of pension, living in the 5th Region, bad perception of health status and diagnoses of chronic conditions.

The results indicate that there is a relation between socioeconomic factors and the use of health services. Because of this, policy makers and health care providers should consider individual characteristics when planning services for the elderly

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

Academic Year: 2009 Advisor's Signature: Worawet Suwanrada

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CHAPTER I

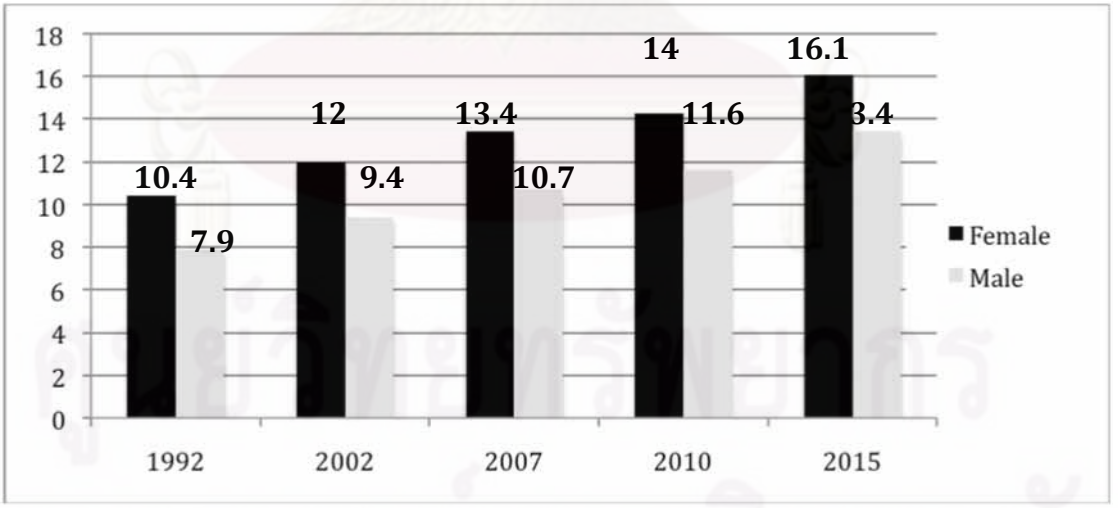
INTRODUCTION

1.1 Rationale:

Chile is in the middle of an advanced demographic transition towards the ageing of its population. Fertility rate has fallen dramatically during the past decades meanwhile; life expectancy has raised and is approaching developed world levels. This increase in the number of elderly population implies a higher prevalence of chronic diseases, and a higher rate of dependency and disability.

According to Chile census data in 2002, the elderly population of the country (more than 60 years old) is 11.4%. Moreover, the National Institute of Statistics of Chile (2007) estimated that for the year 2015, there will be a 29.5% of the population with 60 or more years (see Figure 1). In the next 20 years it is expected that elderly population will grow at a rate of 3.7% per year.

Figure 1 Estimated percentage of elders, 60 years or more, per gender. (National Institute of Statistics, 2007)



The advanced demographic transition faced by the country has also among its consequences a change in the morbidity pattern of the population. There has been an increase in the prevalence of chronic diseases. Hypertension, diabetes and cardiovascular disease are among the most prevalent health conditions of the elderly

in Chile. Together with this, elders have a negative perception of their health status in comparison with younger people. Only 35% of the elders classify their health as good or very good and about 65% of the elders classify their health as bad or very bad. Dependency and disability are also more prevalent among this group. About 21% of the elderly population has shown certain level of dependency. In addition, disability is present in about 40% of the elders (National Service for the Elderly, 2009).

Current demographic situation has brought new challenges for Chilean government and policy makers. In this context, last government program for elders in Chile has established the integrity and dignity of the elders as first priority among its policies. Their objective has been to enhance their human rights and strength their autonomy without discrimination of any kind. Among these policies, one of the most important benefits for the elders is the provision of health services free of charge.

Since the year 2004, elderly beneficiaries of public health insurance receive attention free of charge when they use public sector providers. According to the Social Characterization Survey 2006, only 44% of the people used public physician services when they needed physician services. Therefore, despite getting services free of charge, the use of specialist physicians has been restricted to other factors than the price of services.

In first place the availability of physicians in the public sector is an important factor to determine their utilization. According to recent government estimations, there is a lack of 1500 full time specialists in the public health sector (Ministry of Health, Chile, n.d.). Therefore, it is important to analyze up to which extent other factors, than the number of physicians, determine the use of specialists services among elders in Chile.

Not only the lack of specialists physicians in the public sector has been questioned, but also its uneven distribution trough out the country. According to Table 1, Chile has a dispair distribution of its physicians, with the highest concentration in the Metropolitan Region with 17.3 physicians per 10,000 inhabitants and the lowest in the VI Region with only 5.7 physicians per 10,000 inhabitants.

The number of physicians in each region needs also to be taken into account when studying the determinants of health services utilization, because it represents the availability of the physician supply market to meet the need of services by the elders. Therefore the distribution of physicians in each region of the country will be included in the study of specialist physician services utilization in Chile.

Table 1 Total number of physicians per 10,000 inhabitants, 1996. (Chilean Medical Association, 1996)

Regions	**Total**
I Tarapaca	7.5
II Antofagasta	8
III Atacama	6.5
IV Coquimbo	6.1
V Valparaiso	10.6
Metropolitan Region (Capital)	**17.3**
VI O'Higgins	5.7
VII Maule	4.4
VIII Bio Bio	7.4
IX Araucania	5.9
X Los Lagos	6.3
XI Aysen	5.7
XII Magallanes	9.8

Health care system in Chile is being increasingly questioned in terms of the equity in the provision of health services (Olavarria, 2005). Surveys have found inequalities between public and private services. For example, access to health is faster in the private than in the public sector.

Private system is better evaluated in terms of the time dedicated to each patient and the technical quality of its services. Despite these criticisms, the overall Chilean

health system is considered efficient because of the good health indicators achieved by the country. Chilean life expectancy is above 78 years old for male and over 80 years for women (ECLAC, 2007).

To reduce inequalities in the provision of health services for elder people in Chile it is necessary to pay more attention to the factors that determine the access to medical services (Wallace, 2002). Waiting time after getting an appointment is a factor that determines the use of physician services. It is related to the opportunity and access that different members of the society have to health services. Therefore, it is important to take into account this factor to plan according to population needs and ensure an equal access to health services for all Chilean population.

Chilean health system financing is mixed. According to Pan American Health Organization (n.d.) estimations, public health insurance covers 63% of the population and private health insurances 23%. The remaining 14% of the population is covered by other private plans or has no insurance at all.

Public insurance is provided through Public Health Insurance called FONASA, which receives contributions from its members (7% of monthly salary) and transfers from the national government to cover the indigents and to carry out public health programs. The private sector is represented by Private Health Insurers called ISAPRES.

Services are delivered by public and private providers. The vast majority of primary care establishments are public and depend on municipalities, hospitals are public or private and are under the direction of Health Services. Physicians can freely choose if they want to work as private practitioners or under the control of the government in public facilities.

Another important factor is Chilean pension system, which has been dramatically reformed. Since 1980 it has a new structure based on defined contributions to individual accounts. Due to its importance, the effect of pension system will be also taken into account when analyzing the determinants of physician services utilization in Chile.

Policy implications from this work will be focused on the enforcement of social protection to the elders. The creation of new policies for elders in agreement with their needs will improve their access to health services and their quality of life. The consideration of factors that affect the utilization of health services will help to approach cost escalation and future demands of the population.

Factors that determine the use of physician services need to be known and taken into account when planning policies for the elders. The objectives of Chilean public policies are to give more and better services to the population despite their income level. It is in this context where the knowledge about the factors affecting the utilization of health services among the elders will be helpful for policy makers to implement policies according to population characteristics, needs and expectations.

The framework proposed for this analysis is based on Andersen Behavioral Model of Health Services Use (Andersen & Newman, 1973). There are not other studies using this approach in Chile. The study of health services utilization by the elders in Chile has generated an increasing concern; nevertheless, there are few studies on this topic.

1.2 Research Questions:

Primary Research Question

What are the determinants of physician services utilization by elderly users of public insurance in Chile?

Secondary Research Question:

What are the factors that determine elderly users of public insurance, to use private providers instead of public providers when they need physician services?

1.3 Objectives of the Study

General Objective:

To develop a comprehensive research about the determinants of physician services utilization by elders beneficiaries of the public insurance system in Chile.

Specific Objectives:

(1) To identify the determinants of the use of physician services by elders beneficiaries of the public insurance system in Chile.

(2) To analyze the determinants of private v/s public utilization of physician services by elders beneficiaries of the public system in Chile.

1.4 Scope of the Study

The study will be focused on the use of specialist physicians among Chilean elderly (65 years and above), beneficiaries of the public health insurance in 2006.

1.5 Expected Benefits

Benefits of this study are related to improve health policies to the elderly. The study will lead to know whether other factors different than price of the services determine the utilization of specialist physicians among the elderly in Chile. Another contribution is related to analyze the policy of giving health services free of charge and to study whether it is targeting the elderly beneficiaries of public insurance or not.

Studies focused in elderly population generate a high interest among policy makers and authorities in general. Actual demographic trends show that the increase in elderly population is a phenomenon that is present around the world and that is generating and will generate new challenges for governments in most developing countries. Therefore, improved understanding of the factors affecting health care use among elders in Chile could result in an improving quality of life for them, especially if these factors are taken into account when planning services for this group. The consideration of these factors will help to meet expectations of the elders regarding the delivery of health services.

CHAPTER II

CHILE AND ITS OVERVIEW

2.1 Chilean General Information

Chile is located in southwest South America. It has border with Argentina to the east, Peru and Bolivia to the north, the South Pole to the south and the Pacific Ocean to the west (see Figure 2). Chile measures 4.329 kilometers in length. Placed over a map of Europe, it would extend from Madrid to Moscow (Chilean Government, 2010).

Figure 2 Political map of South America (Maps of the World, 2010).

The long and narrow Chilean shape, has given to the country a wide variety of climates. Ranging from the world driest dessert in the north, to a Mediterranean climate in the center and a rainy temperate climate in the south (BBC Chile Country Profile, 2010).

The capital of the country is Santiago and its official language is Spanish. Since March 2008, the Chilean territory is divided in 15 regions, including the Metropolitan Region, which contains the city of Santiago. Nevertheless, when the study was conducted, Chile was still divided only by 13 Regions. Each region is divided into provinces and each province into districts (Chilean Government, 2010). Despite the division by regions, Chile is not a federal nation, all regions are under the central authority of the government and all have the same laws. Chile has Presidential Government, elected democratically.

In comparison with their neighbor countries Chile is among the most stables and developed countries of the region. It leads Latin American countries in human development index[1] (UNDP, 2009). Chile has also received the honor of being part of the OECD since January of 2010. It is the only and first country in South America to form part of the organization (OECD, 2010).

In terms of economic development, Chilean governments have been concern about the economic exchange of Chile with the rest of the world. During the past years, Chile has signed Free Trade Agreements with Canada, South Korea, China, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, United States, Mexico, Panama, Colombia, Peru, Australia, Malaysia, Turkey, Vietnam and it is in advanced negotiation with Thailand. It has also Economic Cooperation Agreements with the European Union, Mercosur (Common market of the South integrated by Argentina, Brazil, Paraguay and Uruguay) (DIRECON, 2010).

[1] The Human Development Index provides a measure of three aspects of human well-being: living a long and healthy life (measured by life expectancy), being educated (measured by adult literacy and gross enrolment in education) and having a decent standard of living (measured by purchasing power parity, PPP, income).

2.2 Chilean Demographic Situation

Chile's 2002 census reported a total population of 15,116,436. Its growth has been declining since 1990, because of a decreasing birth rate (National Institute of Statistics, Chile, 2007). By 2050 the population is expected to be approximately 20.2 million people. About 85% of the country's population lives in urban areas, with 40% living in Santiago (National Institute of Statistics, 2007). In terms of ethnicity, Chilean population is considered homogeneous.

Chilean population has experienced an accelerated ageing process during the past 30 years. Current life expectancy in Chile is over 78 years for male and 80 years for female. In 1970, people over 60 years old represented an 8% of the country population. On 2002 census, it increases to 11.4% and 4 years later, according to Social Characterization Survey 2006, they represented 13% of the country population. During the next 30 years it is expected that elderly population will increase at a rate of at least 3.7% per year (SENAMA, National Service for the Elderly, 2009).

Furthermore, the distribution of elderly population is uneven in the country. The highest concentration can be found in the central zone and the lowest in the deep south of the country. The reason of this might be explained because of the wide variety of climates that Chile has, from arid deserts in the north to extreme cold weather in the south and deep south of the country. This characteristic gives to the central zone an outstanding location, for the elderly population, because its good location and mild weather

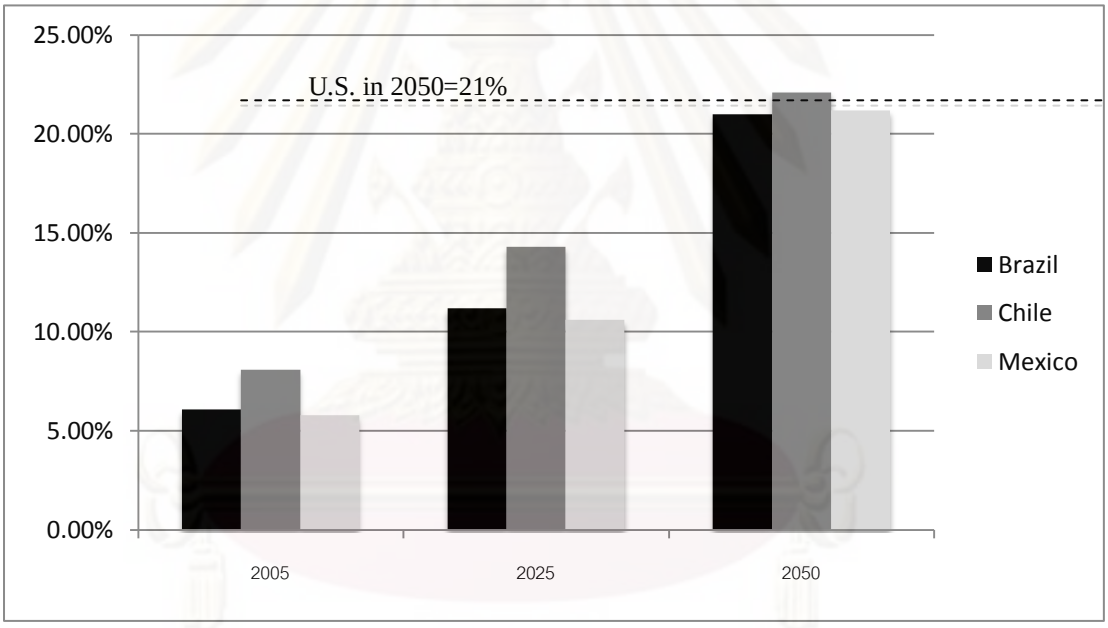
Together with this, fertility has fallen precipitously throughout most of the region over the past several decades meanwhile; life expectancy has soared and is approaching developed-world levels. Chile is among the most aged Latin American countries. It is even estimated that the amount of elderly population by the year 2050 will be higher in Chile than in the United States (see Figure 3).

The increase in aging population has develop new challenges in terms of health care provision and services delivered to this group, there is a heightened interest in the

best ways to care for older adults and prolong their abilities to live independently with a high quality of life. If this goal is achieved the burden of having an increasing elderly population could be minimized.

The advanced demographic transition experienced by Chile is related with a new morbidity pattern that government and authorities should face. This pattern will required that the Health System reorganized its strategies not only towards new technology, but also towards the enhancement and recovery of the dependency and social integration of the elderly.

Figure 3 Elderly (Aged 65 & Over), as a Percent of the Population, 2005-2050 (Jackson, Strauss, & Howe, 2009).



In addition, this demographic transformation is related with other aspects of the economic and social structure of the country. It includes changes in terms of labor force, social security, and poverty. It has financial, political and social consequences that need to be approached with knowledge about the socio economic characteristics of the elders.

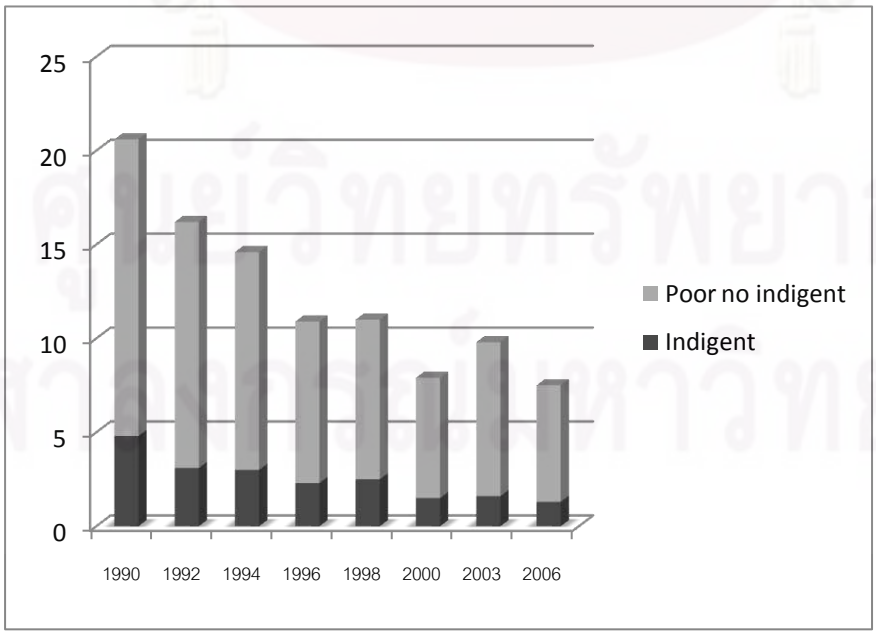
2.3 Social and Economic Situation of Elders in Chile

It has been found that 10.1% of the elderly in Chile are illiterate. This proportion has differences related to age. For example, 13,1% of the elderly between 66 and 75 years are illiterate and 18.2% of the elderly of 76 years and older are illiterate. In average, the amount of studied years by the elderly in Chile is 7 (National Service for the Elderly, 2009).

Most of the elderly live in urban zone and in big cities. Young population has decrease in rural zones and elders have increase because of the demographic phenomenon experienced by the country. This is not happening in urban setting, because there, all age groups are increasing, but a different rate. The elderly are the group that increases at a fastest rate in urban and rural setting.

Between 1990 and 2006 poverty among elders has decrease significantly (see Figure 4). The distribution of the elderly according to the poverty line, indicates that more than 90% of them are not poor in the year 2006. Between the years 1990 and 2006 indigent elderly population decrease from 4.8% to 1.3% meanwhile the poor elder population decrease from 15.8% to 6.2% during the same period.

Figure 4 Poverty incidence evolution among elders 1990-2006, in percentage (National Service for the Elderly, 2007).



National Service for the Elderly (2009) calculated that about 7.5% of the elderly population is poor[2]. Information about households with elderly population in Chile indicates that about 40% of these households are part of the two poorest quintiles. In the year 2006, one quarter of the households of the country were dependent of an elder. Because their income decreases drastically after retirement, those households that were part of the lower income group encounter even worst economic situation after retirement.

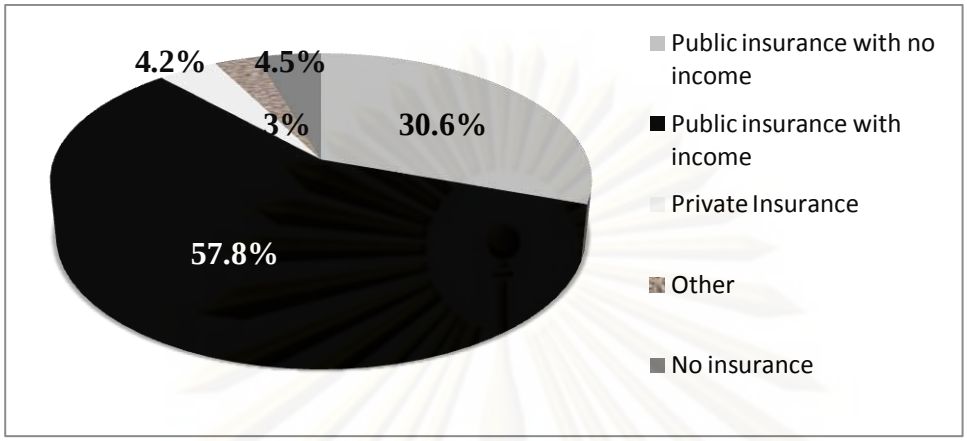
Elderly population in Chile have a high rate of participation in the labor market. This participation has differences between age groups. Among elders of 60-64 years is about 53% which decreases whith age (SENAMA, National Service for the Elderly, 2009). By the other hand, there is an important difference between the labor participation rate of the elderly according to sex. Males have a higher participation than females. It is important to mention that in Chile, there are not legal limitations for elders to keep working.

2.4 Health Situation of Elders in Chile

The economic condition of the elders entails a higher economic burden to the society and government as a whole. Elderly are primary consumers of health services (Bravo, Vasquez, Behrman, Mitchell, & Todd, 2008) and Chilean Government provides and finance health services for the vast majority of them, trough the public health insurance system (see Figure 5). After retirement, there is a massive migration of elders, previously financed by the private system, to the public system. Therefore public system benefits are mostly delivered to high risk and low-income groups, while private system keeps the youngest and wealthier population of the country.

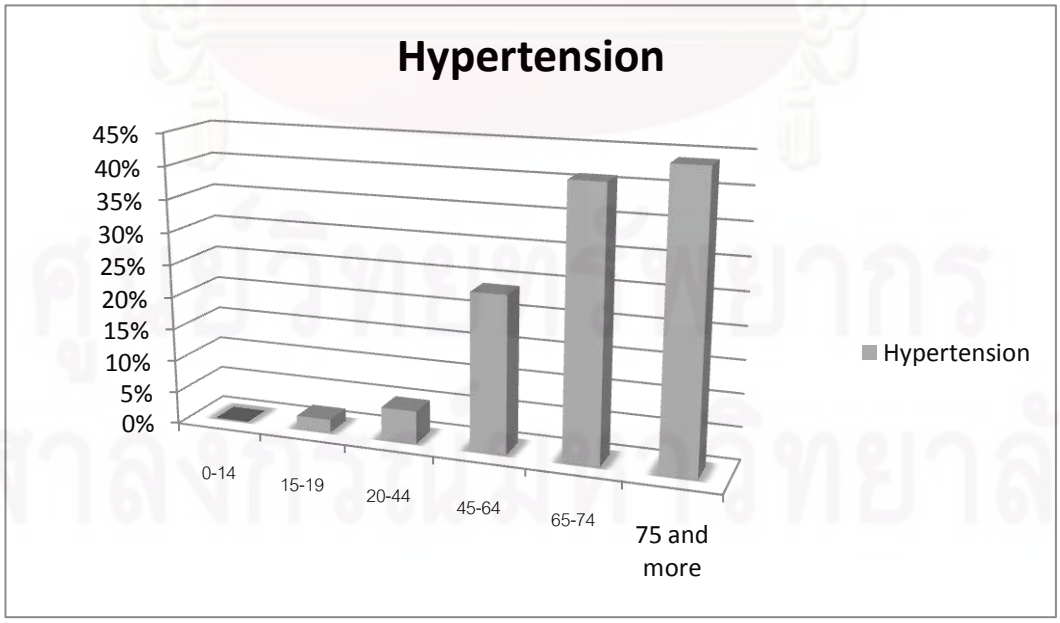
[2] A person is considered poor in Chile when its income per capita is below $47,099 Chilean pesos per month (=94US) in urban zones and $31,756 Chilean pesos (64US) in rural zones. Exchange rate: $1US= 500 Chilean pesos.

Figure 5 Distribution of health care systems among elders (Bravo, et al., 2008).



Elderly have more frequent illnesses episodes than younger population; furthermore there is a change in the pattern of diseases. There is an increase of chronic conditions rather than communicable illnesses among elderly. The most common chronic conditions of elderly in Chile are hypertension, diabetes mellitus and osteoarticular disease. The prevalence of hypertension is 41% between 65 and 74 years old and 44% among elderly of 75 and above.

Figure 6 Prevalence of Hypertension per age groups (SENAMA, National Service for the Elderly, 2009).



Cardiovascular disease is the primary cause of medical utilization by the elderly in Chile. Among the most frequent diagnosis are: heart attack, stroke and hypertension. Gastrointestinal disorders are common, especially gallbladder surgery. Urinary infection in women and prostate pathology are also frequent illnesses among elderly in Chile. The primary cause of death among elderly is cardiovascular disease, followed by cancer and respiratory illness.

Furthermore, dependency and disability are more prevalent among elderly population. According to the Social Protection Survey 2004 (Bravo, Behrman, Mitchell, & Todd, 2006), 21.4% of the elderly needed help of third parties or presented certain degree of difficulty in their daily life activities. 27% of women and 16% of males declared difficulty or the need of help in daily activities. In addition, about 13% of elderly showed certain degree of impairment in their cognitive abilities. This prevalence increases with age, being 43% for elders of 80 years and more (National Service for the Elderly, 2009).

Disability has a high prevalence among elderly in Chile. From the total group of people with disability, 45.2% of them are 60 or more years. About 39% of the elderly in Chile present some kind of disability. They are unevenly distributed among income levels. Most disable elderly are among the lowest income groups (National Fund for Disability, 2004). The most common disability among the elderly is physical disability.

2.5 Health System in Chile

Chilean health system is financed by a mandatory monthly contribution of dependent workers, who are required to purchase health insurance with 7% of their income. There are basically two main systems, the Public Health Insurance managed by the National Health Fund (called FONASA) and the Private Health Insurance, composed by institutions called ISAPRES. The Government provides Pubic Health Insurance for all those who have no income through FONASA.

Public Health Insurance premiums are directly related to income; meanwhile Private Insurance premiums are related to socioeconomic characteristics. In the public system, people buy insurance simply paying 7% of their income, independent of their age, number of beneficiaries or health status. It has four levels according to household income[3].

The delivery of services in the Public Health Insurance has a unique health system with two modalities of assistance. The first is called Institutional Modality, which can be used by any beneficiary that prefers to be attended in Public Hospitals that depend on the Health Services. Elderly receive this assistance free of charge. The second kind of assistance is called Free Choice Modality, by which beneficiaries decide to be attended by public or private health care entities that have subscribed agreements with Fonasa. In this case the user pays out of pocket.

Current Health System in Chile has among its main priorities the wellbeing of the elderly in the country. Therefore there are several benefits for this age group, which entail those beneficiaries of the Public Insurance, especially those with lower economic resources, to have access to medical services. One important benefit is the delivery of health services free of charge for elderly part of the Public Insurance when they use Public Hospitals and Public Health Centers. As it was mention before in Chapter I, regardless of this policy, the majority of elderly used private providers when they needed physician services in the year 2006.

[3] Pubic Insurance levels are: A, for those without income. B for those with minimum salary, 165,000 Chilean pesos (= $ 320 US), C for those with income between 165,000 and 240,900 Chilean pesos (=$320-$480 US) and D for those with income higher than 240,900 Chilean pesos (= $480 US). Values updated on June 1st, 2009. Exchange rate: $1US= 500 Chilean pesos.

CHAPTER III

LITERATURE REVIEW

Health services utilization is an important topic to be studied. Its understanding will help to estimate demand for health care and appreciate it accessibility (Chunhuei, 1998). Health services utilization is defined as obtaining health care, provided by the health care service, in the form of health care contact (Borras, 1994).

3.1 Health Service Utilization Models

Different approximations have attempted to explain health services utilization behavior, involving a large number of variables interrelated in a complex way. In general terms the model that a researcher select to analyze his data depends on the objectives of the study and on the kind of information available.

The variables chosen to estimate health services utilization depend on each scenario, including characteristics of the individual and the health system that covers his needs. In general terms socioeconomic factors are always considered in the estimations (Taylor, Larson, & Correa-de-Araujo, 2006), (Chunhuei, 1998), (Fernandez-Olano, C., Lopez-Torres, J., Cerda-Diaz, R., Requena-Gallego, M., Sanchez-Castano, C., Urbstondo-Cascales, L., Otero-Puime, A. 2006). Together with this, characteristics of the resources available and its distribution among the health system are also considered. Health insurance and income are present in most researches as well as the perception of health status made by the individual and the presence of illness.

3.1.1 Help Seeking Behavior Model

Help seeking behavior model was proposed by Mechanic in 1978, this Model has been broadly used as a predictor of health service utilization. In his general theory of help seeking behavior, Mechanic identified two major factors that explain individual health service utilization behavior. These include (1) an individual's perception of the situation at hand and whether the individual considers the condition

abnormal and (2) the individual's ability to cope with the condition Mechanic 1978 (in Chunhuei, 1998). According to this, an individual will seek professional help only when his ability to cope with the abnormal condition is inadequate.

3.1.2 Health Belief Model

Another model was developed in the 1950s by social psychologists Strecher and Rosenstock (1997) and since then, it has been adapted and modified to explore a wide variety of health behaviors. The Health Belief Model is based on the understanding that a person will take a health-related action if that person: (1) feels that a negative health condition can be avoided (2) has a positive expectation that by taking a recommended action, he or she will avoid a negative health condition (3) believes that he or she can successfully take a recommended health action.

The model was created in terms of four constructs representing perceived threat and net benefits:

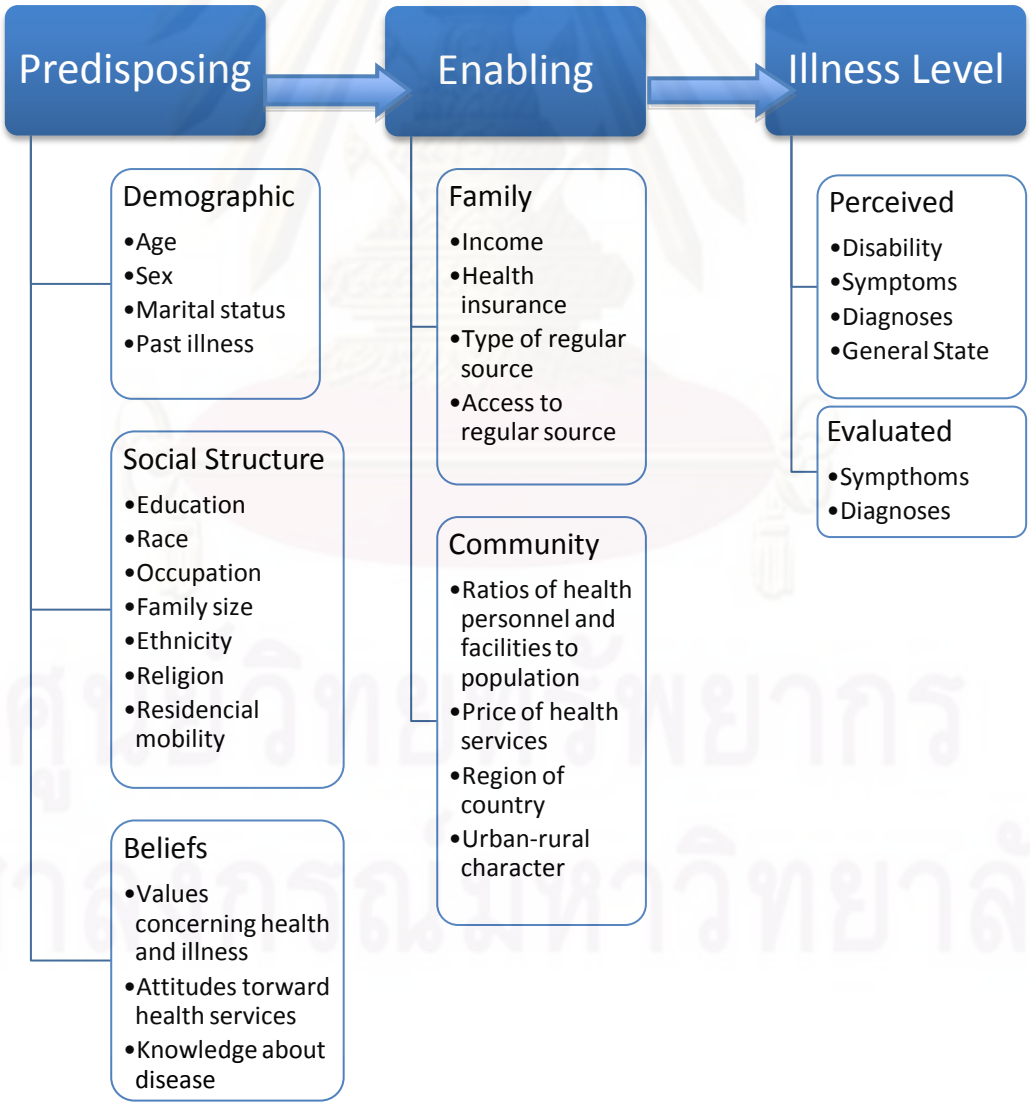
- Perceived susceptibility: own opinion regarding the chance of getting certain condition.
- Perceived severity: own opinion about how serious a condition is and its consequences
- Perceived benefits: own opinion in the efficacy of the health action to reduce the risk or seriousness of the impact of certain health condition
- Perceived barriers: tangible and psychological costs of the health action

Two concepts were added later to the previous constructs, (1) cues to action, which refers to different strategies or factors that influence the action and (2) self-efficacy, which refers to the confidence that an individual have on his or her ability to take action.

3.1.3 Individual Determinants of Health Service Utilization Model (Andersen & Newman, 1973)

This model was developed by Andersen and Newman (1973). Since then, has been applied in different settings. It has the quality of organize together health and health behavior characteristics using sociology, psychology, economics and medicine background (Aday & William, 1997). It classifies the factors that determine health services utilization into three groups: predisposing, enabling and illness level or need factors (see Figure 7).

Figure 7 Individual Determinants of Health Service Utilization (Andersen & Newman, 1973)



Among the predisposing factors, demographic characteristics (age, gender, marital status) reflect the propensity of certain individuals to use health services. The social structure (education, occupation, ethnicity) measures the ability of the individual to cope with the problem, the resources available in the community, and the state of the physical environment (Thind & Andersen, 2003).

Enabling factors represent the ability of the individual to obtain health services. Personal enabling factors include income, health insurance, regular source of care, and travel and waiting times; organizational enabling factors include the availability of health care providers and their spatial distribution.

The most immediate cause of health services utilization is need. The judgment about need can be made by the individual himself, and can be estimated by a self-assessment of health status. Need is also related to the presence of disability and diagnoses of chronic conditions.

3.2 Reasons for using Individual Determinants of Health Service Utilization Model

The selection of this model was based on the availability of information on the data set used for the study. Regarding the Chilean reality, this Model has the ability to include the most important factors that determine health service utilization. There are some minor aspects that need to be modified, for example the original model includes as predisposing factors race and ethnicity. These two factors will not be included in the model, because Chile is considered homogeneous country.

In addition, Andersen Model has 3 advantages for examining the use of health services by old adults: it is the prevailing conceptual frame work for investigating services use, especially for determining whether or not access to and use of health services are equitable, it is eclectic in its interdisciplinary approach; and it is the most amenable model for framing secondary data analysis (Burnette D. & Mui A. 1999). Furthermore, this is the model that better fits the data available for the research of elders' health utilization in Chile.

The theoretical justification for applying this model and for using such explanatory variables is because health services utilization can be analyzed as a type of individual behavior. Therefore is can be explained using characteristics of the individual himself in relation with the environment and the organization of health services.

Individual characteristics can explain the way and frequency that individuals utilize health services. Basically, the use of health services depends on the predisposition of the individual to use services, his capacity to access to the services and his illness level (Andersen & Newman, 1973). These three factors can be explained using variables as sex, age, marital status, education, occupation, income, diagnoses and symptoms among others.

3.3 Previous Researches Using Health Service Utilization Model by the Elderly

Most researches have performed a multivariate analysis in their estimations when using Andersen Behavioral Model. Physician visits and hospital utilization have been the most common measures of health service utilization. Table 2 shows the factors associated with Health Services Utilization by other studies of elders.

When Andersen Model has been applied to elders it have has some modifications to its original form. Some studies have given a high importance to living arrangements because of the high dependency related with aging (Tarler, Namazi, & Wykle, 1988). Other studies have put special attention to the own concern of health status and the requirement of help to perform daily life activities (Parboosingh & Larsen, 1987). In addition, the used of medication, mental health state, life style habits like physical activities and the use of alcohol and tobacco has been important consideration in other studies (Fernandez-Olano, et al., 2006).

Some researchers have shown their concern regarding some aspects of Andersen Model. For example, some of them consider that it is necessary that the model take into account more precise measures of health insurance benefits; because of its potential importance as personal enabling factor for the use of medical services.

There is no doubt in the influence of health insurance benefits in health services utilization. Nevertheless, in the case of this study insurance participation is not an issue. This is because all the elderly in the sample are beneficiaries of the public health insurance.

In addition, a common criticism is because of the overemphasis that need factors have as prime determinants of use at the expense of health beliefs and social structure. Nevertheless, any comprehensive effort to model the use of health services must consider how people view their own general health and functional state as well as how their experience symptoms of illness, pain and worries about their health. In the original model, was hypothesized that predisposing, enable and need factors would have differential ability to explain use depending on what type of service was examined (Andersen R. , 1995). Despite these criticisms, health status, no matter how it is measured, has consistently been shown to be the best predictor of the use of health services (Johnson & Wolinsky, 1993).

Table 2 Factors Associated with Health Service Utilization in Previous Studies

Health Service Type	**Significant Variables**	**Sample**	**Method of Analysis**	**Authors**
Physician utilization	Enabling factors, especially insurance coverage and adult children.	Hispanic Elders in the U.S. (65 years and over)	Logistic Regression	Burnette & Mui (1999)
Physician utilization	For Portuguese, being married, for Vietnamese, being unmarried, and satisfaction with medical care. For Hispanic, being unmarried. For all 3 groups, illness level.	Vietnamese, Portuguese, and Hispanic Elderly (Over 60 years old)	Univariate and Multiple Regression Analysis	Cox (1986)

Table 2 (Continue)

Health Service Type	Significant Variables	Sample	Method of Analysis	Authors
Physician visits and hospital stay	Need and structural social support	Chinese Elders (65 years and older)	Logistic Regression and OLS	Earl, Yu, (1998)
Physician services, hospitalization, ambulatory care home care and dental services	Need for physician services, hospitalization and ambulatory care. Predisposing for dental services.	U.S. Elders (65 years and older)	Zero order correlation and Multiple Regression Analysis	Evashwick, Genevieve, Diehr, & Branch (1984)
General practitioners, nursing visits, specialist visits, lab test, radiological examinations, emergency visits and hospitalization	Need, negative self-reported health status and lower educational level.	Spanish Elders from Albacete City (64 years and above)	Logistic Regression	Fernandez-Olano, et al., (2006)
Emergency room	Attitude towards health care, prior experience with hospital system and number of sources	Canadian elders (over 65 years old)	Multiple Linear Regression and Logistic Regression	Parboosing, Larsen, (1987)
Physician use	Income and perceived severity of symptoms	US Elders (75 years and older)	Path Analysis trough a series of structural regression equations	Tarller, Namazi, & Wykle, (1988)
Western medicine, Chinese medicine, emergency and hospitalization	Need factors and enabling factors such as monthly household income percapita.	Non institutional Hong-Kong elders (60 years and above)	Poisson and Negative Binomial Regression	Yam, Mercer, Wong, Chan, & Yeoh, (2009)

CHAPTER IV

RESEARCH METHODOLOGY

4.1 Conceptual Framework

This research attempted to explain the utilization of health services by the elderly in Chile. To achieve this objective, several aspects were considered as determinants of health services utilization. According to the proposed outline, based on several models revised during the literature review, the utilization of health services depends on factors that can be classified in three different levels: (1) The predisposition of the individual to use services; (2) his ability to secure services; (3) his illness level.

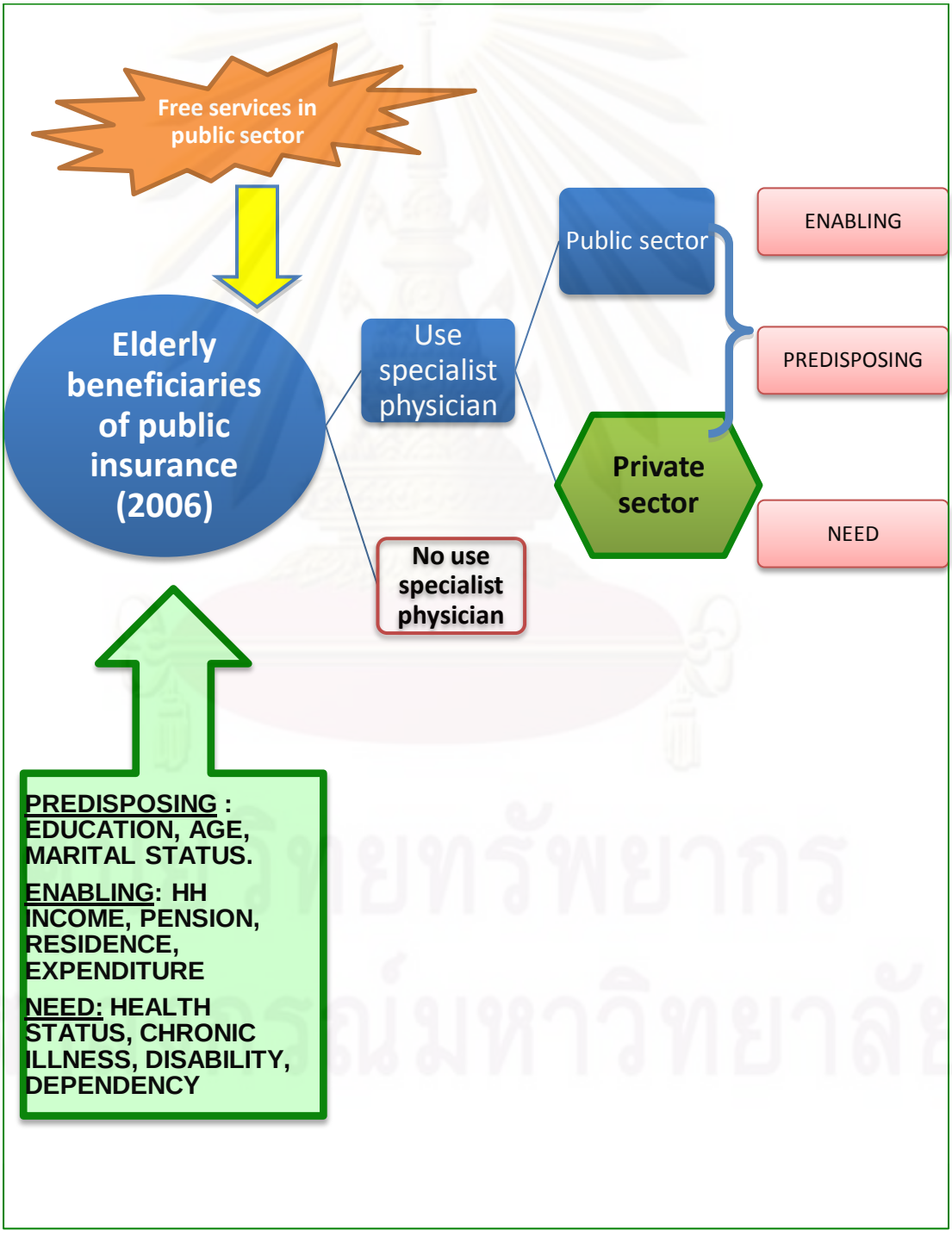
Therefore, using the models of health services utilization mentioned on the literature review, this study intended to establish the factors that determine the use of physician services by the elderly in Chile. The utilization of health services was measured as physician consultations. As elderly the research included every person of 65 years or older.

According to the law 19.828, which created the National Service of the Elderly in the year 2002, an elderly in Chile is every people that have 60 years or more, without difference between men or women (General Secretariat Ministry of the Presidency, n.d.). Nevertheless the retirement age is 60 years old for women and 65 years old for men. The model that will be explained in the further paragraph considers the amount of pension as a factor that determines the use of specialist physician services. Therefore, the study included elders of 65 years and older, because at this age both men and women should be retired in Chile. As specialist physician services the study will include those services provided by non generalist physicians.

The clasification of the individual determinants of health services utilization in predisposing, enabling and need factors; was based on the model of Individual Determinants of Health Service Utilization (Andersen & Newman, 1973). This model was created more than 30 years ago in United States, therefore it needs some

modifications to suit into the Chilean reality of health services utilization. Figure 8 shows the proposed framework to analyze specialist physician utilization among the elderly in Chile. This model was created specially for this study.

Figure 8 Individual Determinants of Physician Services Utilization Among Elders in Chile



As it is possible to observed in Figure 8, the target population of the study are elderly beneficiaries of the public health insurance in the year 2006. Their health behavior is influenced by different factors which make some of them use and some of them no use physician services. According to the literature review the determinants of their individual decision to seek health services can be related to socio demographic factors of the elder, characteristics of the environment and their health situation. For the purpose of the study, those factors where classified into predisposing, enabling and need factors.

Once the elderly decide to utilize physician services there is a second decision that needs to be made. It is related to the use of physicians from the public or private sector. At this point, it is important to remember two facts about the provision of health services to the elderly in Chile. First, the elderly beneficiaries of the public insurance receive public physician services free of charge. Second, when they use physician services form the private sector it implies certain amount of out of pocket expenditure. Therefore, the decision of using physicians from the public or private sector is determined by factors that can be classified as predisposing, enabling and need such as age, gender, education, household income, amount of pension, zone of residence and health status.

The aim of this study is to discover which of this factors are significant in their decision of seeking physician services and after the decision has been made, which factors are determinants in the decision of use private or public services. Consequently, two models were estimated. One used the whole sample of elderly beneficiaries of the public insurance and has as dependent variable the use or non-use of physician services. The second model used as a sample only those elderly who utilized physician services and has as dependent variable the use of private or public services.

The model showed in Figure 8 has the advantage that fits the Chilean reality and that consider important factors that need to be taken into account by policy makers when planning health services for the elderly. For example, it considers not

only household income, but also amount of pension as a single variable capable of determine the use of physician services.

An other contribution of the model is to consider as separate variables chronic illnesses, disability and dependency which will lead to a better understanding of how the illness level determine the use of physician services. In the literature review was highlighted the importance that most researchers gave to need factors which where expressed mainly by the perception of health status, nevertheless in this study need factors included not only own perception of health status but also chronic conditions, dependency and disability.

4.2 Research Design

This was a quantitative study of a nationally representative sample. The study population was people over 65 years from all over the country on the year 2006. Health utilization was measure as use of specialist physician services.

4.3 Sources of Data

Primary Data about Chilean elderly population was taken from Chilean Social Protection Survey (version 2006). This is a longitudinal survey that provides information to develop a microeconomic analysis of Chilean pension system. It was initiated in 2002 and it have has additional survey waves in 2004, 2006 (Arenas, Bravo, Behrman, Mitchell, & Todd, 2006). The survey utilizes a randomized representative sample of the total country population of 15 years and above (Bravo, Behrman, Mitchell, & Todd, 2006).

The information used to develop this research was obtained from the Chilean Social Protection Survey 2006. The Social Protection Survey and the sample, taken from this survey, to elaborate the study will be described with more detailed in the next section.

Social Protection Survey 2006

Target Population: Chilean population of 15 years and more

Population sampled: People of 15 years and more from all over the country on the year 2006

Sample: The total sample used in the Social Protection Survey 2006 was conformed by 19,873 people (Bravo, Vasquez, Behrman, Mitchell, & Todd, 2008). Among this number, the survey includes 2,640 interviewees over 65 years old.

Sampling technique: The sample was chosen from two sources, first from the universe of people affiliated to the pension system and from the data of census 2002. To get a representative sample of the country population, it was used a design in two stages. In the first stage, there were selected representative communes[4] of the country. In the second stage, the people from the selected communes were stratified according to their condition in relation to the pension system, sex and age (Bravo, 2002).

Population and Sample of the Research **(taken from the Social Protection Survey 2006)**

Target Population of the research: retired Chilean population of 65 years and more who are beneficiaries of the public health system

Sample: People over 65 years beneficiaries of public insurance were selected for the study. The survey included 2,640 people over 65 years old. Among them 2,281 were users of the Public Insurance System.

4.4 Data Analysis

Accordingly to the objectives and the research questions that have motivated this study, there were estimated two models. The first model was related to the first specific objective, which was to identify the determinants of the use of physician

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[4] In the year 2006, when the study was conducted Chile was divided into 13 regions. Current Chilean political division is conformed by 15 regions, 53 provinces and 346 communes

services. Therefore, the dependent variable in the first model was the use or non-use of physician services and the sample included all elderly beneficiaries of the public health insurance.

The second estimated model was related to the second specific objective, which was to analyze the determinants of private v/s public utilization of physician services. Consequently, the dependent variable in the second model was the use of private or public physician services. The sample of this model was conformed only by those elders who went for physician consultations.

Logistic regression was used to estimate the parameters specified in these models. The choice of the dependent and independent variables was based on the model of individual determinants of physician services utilization among elders in Chile (Figure 8) and was driven by the potential effect that the variables can have on the users of medical services.

In the following logistic equation, P is the probability of the desired outcome. α represents the constant term and βi are the estimated regression coefficients. The β coefficients indicate the expected log odds on the dependent variable associated with a unit change in the independent variable. The odds are defined by the ratio between the probability of success outcome and the probability of failure outcome.

$$Ln\left(\frac{P}{1-P}\right) = \alpha + \beta iXi + \varepsilon$$

Logistic regression model was chosen to analyze physician services utilization by the elderly in Chile, because the intention of this research is to compare those elders who use physician services with those who do not use their services and to compare those who utilize private instead of public physicians. This model was the most suitable to the objectives of the study.

4.4.1 Definition of Dependent Variables:

Use or non-use of physician consultations: Probability of using outpatient specialist physician visits from private or public sector. This variable will be used in the first model.

Use or non-use of private providers when using physician consultations: Probability of using outpatient private specialist physician visits. Private providers will be defined as all providers working outside the direct control of the state (Hanson & Berman, 1998). This variable will be used in the second model.

4.4.2 Definition of Independent Variables:

The independent variables utilized in this research can be classified into predisposing, enabling and need variables.

Predisposing variables: were those variables that make some individuals more likely to use health services. Among them were:

- Educational Level (EDU): it was measured as four dummy variables. According to the last complete educational level achieved by the interviewee. The possibilities were: complete primary education, complete secondary education, technical professional education and complete university education and above.
- Age: measured in years, only individuals of 65 years and above at the time of the survey were included in the study.
- Sex: was measured as a dummy variable where female was equal to 1 and male equal to 0.

- Marital status (MT): was measured as three dummy variables. The possible answers for this variable were married or consensual union, widow, divorced, separated or single.

Enabling variables: were those variables that make some individuals more capable than others to secure their access to health services. Among them were:

- Monthly percapita household income (HINC): this variable was calculated using information about monthly salary in the primary occupation of each member of the household. Each salary was sum up and then divided per the amount of persons in the household. This was measure in Chilean pesos.

- Amount of individual pension per month (PE): this was obtained directly from the survey. Those interviewees who were eligible for pension at the time of the survey respond to the question of how much do they received monthly in terms of retirement pension. It was measured in Chilean pesos.

- Region of residence (RE): Chile is divided into 13 regions, the distribution of physicians among its regions is uneven, therefore regions were considered in the estimations. There were 12 dummy variables, the reference region was the Metropolitan region, where the capital of the country is located and which concentrates more than 40 percent of the total country population.

- Expenditure on physician services (EX): it was calculated using a proxy of expenditure according to age, sex, different illnesses and region of residence. It was measured in monetary terms.

Need variables: were those variables related with the illness level perceived and diagnosed. Among them were:

- Own perception of health status (OP): The possible answers in the survey were: excellent, very good, good, reasonable, bad and very bad. It was

measured as two dummy variables: good or reasonable, and bad or very bad. The reference variable was to have a good or very good health status.

- Diagnosis of chronic illnesses (DG): this variable included the presence of asthma or emphysema, depression, diabetes, hypertension, cardiac problems, cancer, arthritis or arthrosis, renal disease, brain hemorrhage, mental illness, HIV AIDS diagnosed by a physician. To include this variable in the model the answers to this question were transform into two dummies: one chronic condition or more than one chronic condition. The reference variable was to not have any chronic condition.

- Presence of disability (DIS): this variable included hearing disability, speaking disability, visual disability, mental disability, physical disability and psychiatric disability. To include this variable into the model, it was transformed in a dummy variable; if the person have disability it was equal to 1 and 0 if otherwise.

- Dependency in daily life activities (DAC): this variable includes difficulty in doing demanding or intense exercise, walking long distances, going up stairs, bathing, getting dressed, eating and getting out of bed. To include this variable in the model it was transformed into a score according to the amount of activities where the elderly needed help of others. The score range from 0 to 7. 0 is equivalent to not dependency and 7 to dependency in 7 daily activities.

Extended information about the variables can be found in Table 3, which shows each variable, how it was measured and its expected sign. Table A1 in the Appendix shows the questions of the Social Protection Survey where the information of each variable was obtained. In addition, in point 4.4.4 it is explained with further detail the explanation of each expected sign.

Table 3 Definition, measurement and expected sign of each independent variable

Abbreviation	Variable	Measure as	Expected Sign
PC	Physician Consultation	Dummy 1= Use physician consultation 0= No use physician consultation	
PRPC	Private Physician Consultation	Dummy 1= Use private physician consultation 0= No use private physician consultation	
EDU	Educational Level	Dummy	+/_
		EDU_1: 1= Complete Primary Education 0= Otherwise	
		EDU_2: 1= Complete Secondary Education 0= Otherwise	+/-
		EDU_3: 1= Technical Professional old and new system 0= Otherwise	
		EDU_4: 1= Complete University Education and above 0= Otherwise	
		If all EDU_1, EDU_2, EDU_3, EDU_4=0, it means illiterate	
AGE		Measure in years. Using the answer of each individual to the question: how old are you?	+

Table 3 (Continuation)

Abbreviation	**Variable**	**Measure as**	**Expected sign**
SEX	SEX	Dummy 1= Female 0= Male	+/_
HINC	Per-capita household income	Monetary terms in Chilean pesos	+
PE	Amount of monthly individual pension	Monetary terms in Chilean pesos	+
RE	Region of residence	Dummy RE_1: 1= Region I 0= Otherwise RE_2: 1= Region II 0= Otherwise RE_3: 1= Region III 0= Otherwise RE_4: 1= Region IV 0= Otherwise RE_5:1= Region V 0= Otherwise RE_6: 1= Region VI 0= Otherwise	+/-

Table 3 (Continuation)

Abbreviation	Variable	Measure as	Reference
RE	**Region of Residence**	RE_7: 1= Region VII 0= Otherwise	+/
		RE_8: 1= Region VIII 0= Otherwise RE_9: 1= Region IX 0= Otherwise RE_{10}:1= Region X 0= Otherwise RE_{11}: 1= Region XI 0= Otherwise RE_{12}: 1= Region XII 0= Otherwise If all Regions (RE)=0, it means Metropolitan Region	+/-
EX*	Expenditure on physician services	Proxy in monetary terms	-
OP	Own perception of health status	Dummy OP_1 : 1= Good or reasonable 0= Otherwise OP_2 : 1= Bad or very bad 0= Otherwise If OP_1, OP_2=0, it means a very good health status	+

Table 3 (Continuation)

Abbreviation	Variable	Measure as	Expected sign
DG	Diagnosis of chronic illnesses	Dummy DG_1: 1= One chronic condition 0= Otherwise DG_2: 1= More than one condition 0= Otherwise If DG_1, DG_2=0, it means no have chronic conditions	+
DIS	Presence of disability	Dummy 1= Have disability 0= Otherwise	+
DAC	Dependency in daily life activities	Score from 0 to 7 0= No dependency 1= Dependency in 1 activity 2= Dependency in 2 activities 3= Dependency in 3 activities 4= Dependency in 4 activities 5= Dependency in 5 activities 6= Dependency in 6 activities 7= Dependency in 7 activities	+

*EX: The sample to calculate the estimated expenditure in physician services was conformed for those elders that went to private physician consultation. This estimated value was used to complete the information about expenditure on physician services for those elders who went to public physicians. Public services are free of charge for the elderly; therefore this estimated value will fill the missing data about expenditure on physicians for those elders who used public services. The following equation was used:

$EX_{physician} = \beta_1 + \beta_2 AGE + \beta_3 SEX + \beta_4 RE + \beta_5 DG + \varepsilon$

$EX_{physician} = \beta_1 + \beta_2 AGE + \beta_3 SEX + \beta_4 RE_1 + \beta_5 RE_2 + \beta_6 RE_3 + \beta_7 RE_4 + \beta_8 RE_5 + \beta_9 RE_6 + \beta_{10} RE_7 + \beta_{11} RE_8 + \beta_{12} RE_9 + \beta_{13} RE_{10} + \beta_{14} RE_{11} + \beta_{15} RE_{12} + \beta_{16} Asthma + \beta_{17} Depression + \beta_{18} Diabetes + \beta_{19} Hypertension + \beta_{20} Cardiac + \beta_{21} Cancer + \beta_{22} Arthritis + \beta_{23} Renal + \beta_{24} Brain + \beta_{25} Mental + \beta_{26} HIV + \varepsilon$

Therefore, estimated $EX_{physician}$ is the proxy average cost "if" the elder go to private physician for those elderly who went to public physicians. More detail about the estimated expenditure on physician services can be found on Table A2 of the Appendix.

Using this new estimated value, there was calculated an estimated expenditure for those observations who used public physicians.

When using expenditure in the estimations, it was used the real expenditure for those who used private physicians and estimated expenditure for those who used public physician services.

4.4.3 Equations

(1) Use/no use physician consultation:

$$Ln\left(\frac{PC}{1-PC}\right) = f(EDU, AGE, SEX, MT, HINC, PE, RE, EX, OP, DG, DIS, DAC)$$

(2) Use/ no use of private providers when using physician consultations:

$$Ln\left(\frac{PRPC}{1-PRPC}\right) = f(EDU, AGE, SEX, MT, HINC, PE, RE, EX, OP, DG, DIS, DAC)$$

where PC = Probability of use Physician Consultations

PRPC = Probability of use Private Physician Consultations

EDU = Educational Level

MT = Marital Status

HINC = Household Income

PE = Amount of pension

RE = Region of residence

EX = Expenditure on physician services

OP = Own perception of health status

DG = Diagnosis of chronic illnesses

DIS = Presence of disability

DAC= Dependency in daily life activities

In the first equation, the whole sample of elders of 65 years old beneficiaries of public insurance was used. The sample of the second equation was conformed by those elders who went for physicians' consultations during the study period.

4.4.4 Expected Relation Between Dependent and Independent Variables

According to the literature review, the behavior of each variable will differ in each model. The effect of certain factor will affect in a different manner the use or non-use of physicians and the use of private or public sector services. Table 3 shows a summary about the expected signs for each explanatory variable.

In a first approach to the econometric calculations of this research, all independent variables were included in both models. Nevertheless, the final estimations used only some variables. The reason of this is because some variables were appropriate to explain the use or non-use of physicians and other variables were appropriate to explain the use of private versus public services. The criteria used in the decision of keeping certain variables and dropping others was taken from the

literature review and the expected performance of each variable in terms of health services utilization.

Among predisposing factors, the role of education is not clear, because it could increase or decrease the utilization of physician services. A well-educated person could have more ability to produce efficient home care and seek less professional health services. By the other hand, a person with high educational level could be more aware of a certain disease and look without hesitation for medical care (Chawla, et al., 2007). Related to the use of private or public physician services it is expected that higher educational level will have a positive relation with the use or private physicians (Hanson & Berman, 1998).

It is believed that age increases the utilization of physician services until certain level, which after an advanced age, will start to decline. According to Santerre & Neun (2007) as age increases the health stock decrease, therefore elders tend to utilize more medical services. However, it has also been found that health services utilization among elders decline for the very old (Chawla, et al., 2007). In terms of the effect of age in the use of private or public physician services it has been found that age has a positive effect in the probability of using private health care until the age of 65 years, after which the probability declines (Machnes, 2006).

It is also expected that being female increase the probability to use physician services, because females tend to use more health services. Some diseases are more prevalent in females than in males, as is the case of osteoporosis, immunologic diseases (rheumatoid arthritis), mental disorders and Alzheimer's disease (Miller, 1994).

The role of marital status has shown to be more important in relation with hospital care, which is not the concern of this study. A married individual is likely to demand less health services because of his higher ability to secure home care.

It is expected that price pays an important role in the probability of using physician services, because of the law of demand. As price increases, the probability of using physician services decrease. Income is another important factor, which

represents the purchasing power of the individual. Because health care is considered a normal good, if income increases, it is expected that the probability of using physician services will also increase (Santerre & Neun, 2007).

Other significant variables expected in the model are the own perception of health status, diagnosis of chronic illnesses, presence of disability and dependency in daily life activities because they reflect the need of the person to seek physician services. It is more likely that sicker people demand more medical services than healthier people. In addition, a multi-morbidity status has been found as highly predictive of the use of private physician services (Yam, Mecer, Wong, Chan, & Yeoh, 2009).

Furthermore, it is also expected to face some problems because of the possible interrelation between variables.

4.4.5 Test for Significance of Each Factor

P-Value was used to test the significance of each coefficient. P-Value tells the lowest level of significance at which it is possible to reject the null hypothesis. To reject a null hypothesis it is neccesary to have a low p-value.

The hypothesis was

$H_0 : \beta_i = 0$

$H_1 : \beta_i \neq 0_i = 1, 2, 3, \ldots$

The interpretation of this test is that if the nullhypotheis H_0 is true, the corresponding independent variable is not related with the dependent variable, and its value can not be used to make any conclusion. On the other hand, if H_1 is true, it implies that there is a relationship between that variable and the dependent variable.

CHAPTER V

RESULTS AND DISCUSSION

The sample included in the research was taken from the Social Protection Survey 2006 and it was conformed by 2,281 elders of 65 years and older, users of the Public Insurance System in Chile. The unit of analysis was the elder himself. The individual data was studied using the methods described in the previous chapter.

5.1 Data Description

To get a better understanding of the results, it is important to know the main characteristics of the sample used in the research. Therefore in the following points, it will be provided a brief description of the sample according to different criteria. In addition, Table 4 provides the profile of the 2281 individuals that formed the sample.

1) Distribution of the sample according to age: 64.5% of the sample is between 65 and 75 years and 35.5% are over 75 years old.

2) Distribution of the sample according to gender: 48.7% of the sample are males while 51.3% are females.

3) Distribution of the sample according to marital status: 50.7% of the sample is single, 39.6% is married or are under consensual union, 4.7% are divorced, 4% are widow.

4) Distribution of the sample according to educational level: 11.9% of the sample is illiterate, 57.8% have primary education, and 24.9% have high school education. Only 4,9% have some kind of higher educational level (university or technical institute).

5) Distribution of the sample according to amount of pension: 49.6% of the sample does not receive any pension. 50,4% receive pension. Among those who receive pension, 1.8% receive less than $47,000 Chilean pesos (94US). This amount is relevant because this amount of income percapita established the poverty line in Chile. 55.7% receive between $47,001 and $96,000 Chilean pesos (94US-192 approx.). 20.5% receive between $96,001 and $145,000 Chilean pesos (193US-

290US). 6.9% receive between $145,001 and $ 194,000 Chilean pesos (291US-388US). 4% receive between $194,001 and $ 245,000 Chilean pesos (389US-490US). 3.8% receive between $245,001 and $300,000 (491US-600US). The rest 7.8% receive between $300,001 and $870,000 (600US-1740US).[5]

6) Distribution of the sample according to region of residence: 35.3% of the sample live in the metropolitan region, followed by 15.2% in the 8th Region, 10.6% in the 5th Region, 7.4% in the 10th Region, 6.9% in the 7th Region and 6.5% in the 6 and 9 region. The rest of the regions (1, 2, 3, 4, 11, 12) have all together an 11.6% of the sample population.

7) Distribution of the sample according to expenditure on physician services: 1149 people in the sample went for physician services. Among them 63% did not pay for the consultation. 37% of them pay, among those who pay, 22.2% pay between $1,000 and $10,000 Chilean pesos (2US-20US), 8.7% pay between $10,000 and $50,000 (20US-100US) and 6.1% pay more than $50,000 Chilean pesos (100US).

8) Distribution of the sample according to own perception of health status: 5.7% of the sample described their health as excellent or very good. 70.1% described their health as good or reasonable and 24.2% classified their health as bad or very bad.

9) Distribution of the sample according to diagnoses of chronic illnesses: 51% of the sample have hypertension, 20.6% arthritis, 17.7% cardiac problems, 16.1% diabetes, 12.5% depression, 8.7% asthma or emphysema, 4% renal disease, 2.8% cancer, 1.2% brain hemorrhage, 1.2% mental illness, none of the sample have HIV.

10) Distribution of the sample according to presence of disability: 6.7% have hearing disability, 1.1% speaking disability, 8.1% visual disability, 1.5% mental disability, 16.5% physical disability, 0.5% psychiatric disability and 1.6% have other kind of disability.

11) Distribution of the sample according to dependency in daily life activities: 25.5% of the sample presented difficulties to do demanding exercise, 26.7% have difficulties

[5] Exchange rate:1US= 500 Chilean pesos

to walk long distances, 24.9% have difficulties to go up stairs, 12.1% have difficulties to bath, 8.2% have difficulties to get dressed, 3.9% have difficulties to eat, 6.8% have difficulties to get out of bed.

Table 4 Profile of the sample composed by elderly of 65 years and above beneficiaries of the Public Health Insurance

	Total (N=2,281)	
	Frequency	**Percent**
Age		
65-74 years	1,368	60%
75-85 years	742	32.5%
More than 85 years	171	7.5%
Gender		
Female	1,171	51.3%
Male	1,110	48.7%
Marital Status		
Married or consensual union	1,168	51.2%
Single, widow, divorced	1,113	48.8%
Education		
Illiterate	271	11.9%
Primary Education	1,320	57.9%
High School	568	24.9%
University or technical educ	122	5.3%
Pension		
No pension	1,131	49.6%
Less than 94US	21	0.9%
94US-192US	634	27.8%
193US-290US	235	10.3%
291US-388US	79	3.5%
389US-490US	45	2%
491US-600US	44	1.9%
601US-1,740US	92	4%

Table 4 (Continued)

	Total (N=2,281)	
	Frequency	**Percent**
Region of residence		
Metropolitan Region	806	35.3%
Region 1	30	1.3%
Region 2	48	2.1%
Region 3	37	1.6%
Region 4	118	5.2%
Region 5	242	10.6%
Region 6	148	6.5%
Region 7	157	6.9%
Region 8	347	15.2%
Region 9	149	6.5%
Region 10	169	7.4%
Region 11	12	0.5%
Region 12	8	0.8%
Expenditure on physician		
Not use physician services	1,132	49.6%
Use physician service but no pay	725	31.7%
2US-20US	270	11.8%
20US-100US	92	4%
More than 100US	62	2.7%
Perception of health		
Excellent or very good	130	5.7%
Good or reasonable	1,598	70.1%
Bad or very bad	553	24.2%

Table 4 (Continued)

	Total (N=2,281)	
	Frequency	**Percentage**
Chronic illnesses		
Hypertension	1164	51%
Arthritis	470	20.6%
Cardiac problems	404	17.7%
Diabetes	368	16.1%
Depression	286	12.5%
Asthma	199	8.7%
Renal disease	92	4%
Cancer	65	2.8%
Brain Hemorrhage	28	1.2%
Mental illness	28	1.2%
Disability		
Hearing disability	153	6.7%
Speaking disability	26	1.1%
Visual disability	184	8.1%
Mental disability	34	1.5%
Physical disability	376	16.5%
Psychiatric disability	12	0.5%
Other	37	1.6%
Dependency		
Demanding Exercise	581	25.5%
Walking long distances	609	26.7%
Going up stairs	567	24.9%
Bath	276	12.1%
Get dressed	187	8.2%
Eat	89	3.9%
Get out of bed	155	6.8%

5.2 Determinants of Physician Services Utilization Among Elderly

The consideration of the factors affecting health services utilization will lead to policy makers to pursue appropriate health services policies that fit in a better manner population needs. Is in this aspect, were the establishment of factors that determine health services utilization will be useful.

Out of all the elders included in the research, approximately 50% of them did not use specialist physician services. Among the users of physician services about 40% of them preferred to utilize private instead of public physicians. Based on this figures, two logistic models were estimated. The dependent variable in the first model was the use or non-use of physician services. In the second model, the dependent variable was the use of private versus public physicians.

The resulting output for the first model is shown in Table 5. The dependent variable in this first model is the probability of using physician services (either private or public sector). First, it is possible to observe that the model has 13 significant coefficients. Educational level, sex, residence in Regions 7, 9, 10, own perception of health status, diagnoses of chronic conditions and dependency in daily life activities were significant variables.

Predisposing variables of physician's services utilization have shown different values and significances in the model (see Table 5). The four dummy variables representing different educational levels (EDU1: complete primary education, EDU2: complete secondary education, EDU3: technical professional old and new system, EDU4: complete university education) were significant and all their coefficients had a positive sign. According to the literature review, it was possible to expect a positive sign in the variables related to educational level, which indicates that as education increases, the probability of using physician services also increases.

Table 5 Logistic Regression Results of Model Predicting Use versus Non use of Physician Services among elders in Chile.

Variable	Coefficient	z-statistics	Prob	Odds Ratio
C	-2.0335	-3.5454	0.0004*	0.1308
EDU1 (primary education)	0.3597	2.4599	0.0143*	1.4328
EDU2 (secondary education)	0.8111	4.8482	0.0000*	2.2503
EDU3 (Technical education)	0.8340	3.2548	0.0011*	2.3025
EDU4 (University)	0.9265	3.9694	0.0001*	2.5256
AGE	0.0113	1.7753	0.0758	1.0113
SEX	0.2074	2.3382	0.0194*	1.2304
MT1	-0.0502	-0.3355	0.7372	0.9510
MT2	-0.0061	-0.0381	0.9695	0.9939
MT3	0.2181	1.0014	0.3166	1.2437
HINC	-7.82E-10	-1.3710	0.1704	0.9999
PE	5.40E-09	1.4011	0.1612	1
RE1	0.1507	0.3941	0.6934	1.1626
RE2	0.0313	0.1020	0.9187	1.0317
RE3	-0.4778	-1.3482	0.1776	0.6201
RE4	0.2254	-1.0907	0.2754	1.2528
RE5	0.0881	0.5837	0.5594	1.0920
RE6	-0.3238	-1.6887	0.0913	0.7233
RE7	-0.4965	-2.6383	0.0083*	0.6086
RE8	-0.0589	-0.4406	0.6595	0.9428
RE9	-0.4877	-2.5554	0.0106*	0.6140
RE10	-0.5930	-3.2339	0.0012*	0.5526
RE11	-1.4614	-1.8559	0.0635	0.2319
RE12	0.1290	0.2664	0.7899	1.1376

Table 5 (Continued)

Variable	Coefficient	z-statistics	Prob	Odds Ratio
EXPENDITURE	-1.02E-05	-1.8523	0.0640	0.9999
OP1 (percep. of health status: good or reasonable)	0.4962	2.4631	0.0138*	1.6424
OP2 (percep. of health status: bad or very bad)	1.0612	4.8362	0.0000*	2.8898
DG1 (diagnose of chronic condition: 1 chronic condition)	0.0043	0.0462	0.9631	1.0043
DG2 (diagnose of chronic condition: more than 1 chronic condition)	0.3110	2.9284	0.0034*	1.2748
DAC (Dependency in daily life activities)	0.0596	2.0375	0.0416*	1.0614
McFadden R-squared	0.0461			
N	2281			

*Significant Coefficients at 5%

According to the odds ratio value, those elders with higher education are more likely to seek physician services than those with no education. This increases together with the educational level. For example, there are 1.43 times more chances that an elder with primary education use physician services than an elder with no education. An elder with secondary education has 2.25 more chances to use physician services, an elder with technical education has 2.30 times more chances of utilize the services and an elder with university education have 2.52 times more chances of using physicians services in comparison with someone with a lower educational level. The reason of this might be explained for several factors. The first is related to the higher income level that accompanies higher education. In second place it is well known that people with higher education seek more frequently health service because they can make a better decision related to their need of services and they are more aware of their illnesses.

The variable sex was also significant with a positive sign, as it was expected. Which indicates that females are more likely to use physician services than males. The odds ratio value indicates that being a female increase in 1.23 the odds of using physician services.

The predisposing variables of age and marital status were insignificant. It indicates that among the elders of this sample, the age do not increases the probability of using physician services. According to the literature review, it was expected to find a positive relation between age and the use of physicians, which was not found in this data set. The reason for this might be because the sample was conformed only by elderly who already have the higher utilization rate of physician services, thus among them, there were not big differences related to age. In terms of marital status, it was also expected that being married increases the probability of using physician services, which was not found on this research.

Enabling variables, which make individuals more capable to secure their access to physician services, have shown different results in the previous table. Household income and amount of pension were not significant. Regions 1 to 6, 8, 11 and 12 were also not significant. By the other hand, Regions 7, 9 and 10 showed significant coefficients. The coefficients of these Regions had negative sign. Therefore, living in the 7^{th}, 9^{th} and 10^{th} Regions of the country have decreased the odds of physician services utilization. Living in the 7^{th} Region decreases the odds 0.60 times, living in the 9^{th} Region decreases the odds 0.61 times and living in the 10^{th} Region decreases the odds 0.55 times. This could be explained by the low number of physicians per inhabitant that these regions have in comparison with the other regions of the country, especially if we compare them to the Metropolitan Region. Another important factor to consider is Chilean long and narrow geographical shape which concentrates the majority of the population and resources in the center of the territory. Regions 7^{th}, 9^{th} and 10^{th} are part of the south of the country.

Estimated expenditure was not significant, nevertheless it had the expected negative sign. Thus, if expenditure in physician services increases, the probability of using physician services decreases.

The variables of region of residence and expenditure are important, because they have policy implications. Even though they represent individual realities, they are possible to be changed. For example the variable region represents the availability of physicians for each zone of the country, which differs greatly from one area to the other. This could be modified with the redistribution and reorganization of physicians trough out the country. Expenditure could be managed with more subsidies for those with a precarious economic situation.

Among need factors, the two variables of own perception of health status showed significant coefficients with positive signs. Having a good or reasonable perception of their own health status increases the odds of using physician services in 1.64. Having a bad or very bad perception of their own health status increase the probability of using physician services in 2.88.

Diagnosis of one chronic condition was no significant, but diagnoses of more than one chronic condition was significant and with a positive sign. Therefore, having more than one chronic condition increases the odds of using physician services in 1.04. This indicates that people with more illnesses are more likely to seek physician services than those people with better health. Also dependency in daily life activities has a significant coefficient with a positive sign which indicates that being dependent for the performance of daily life activities increases the chances of using physician services in 1.06 times. This could be explained because dependent people are more likely to have higher need of health services. These coincide with the literature review which indicates that need factors are relevant in the decision of using health services.

It is important to notice that having a bad perception of their health status together with a high educational level (secondary, technical or university) are the variables that increase more the odds of physician services utilization. This should be consider when planning policies for the elders because while time pass in the Chilean society, together with the aging of its population, also the educational level of the people increases, therefore it is possible to expect an increasing demand of health services. Especially if the elderly have negative life styles which will tend to increase a bad perception of their health status.

5.3 Determinants of Private Physician Services Utilization among Elders in Chile

As it was explain in the introductory chapter, elderly beneficiaries of the public insurance in Chile have access to health services free of charge. Nevertheless, according to the Social Protection Survey 2006, 40% of the cases went to private practitioners instead of public when they seek physician services. It is important to remember that half of the elders do not receive any pension at all, so it is likely that the support to get private physician services comes directly from their families.

As it was explained before, there was estimated a second model about the utilization of private versus public physician services. The dependent variable in this second model is the probability of using private specialist physician services. It is possible to observe that 9 of the estimated coefficients were significant. Technical and university education were significant. Together with these sex, amount of pension, residence in Region 5, own perception of health status, diagnoses of one chronic condition and diagnoses of more than one chronic condition were also significant.

Among predisposing variables, higher educational levels were significant in the decision of private versus public physician' utilization. As it was expected, when educational level increases the probability of using private physician also increases. According to the odds ratio value, those elders with higher educational level, like technical education or university have a higher chance of using private physician services. Having technical education increases the odds of using private physician services in 3.32 times more than those elders without this kind of education. In addition, having university education increases the odds of using private physician services in 5.02 times more than those elders without this kind of education. This could be explained because education is normally related to income level. Therefore elders with higher educational level could possibly have higher income, which will lead them to a better access to private physician services. By the other hand, it is also believed that people with higher education have more probabilities to seek medical care because they have better knowledge of sickness and health.

Age had a positive sign, which means that as age increases, also does the probability of using private physicians; nevertheless, it was not significant in this data set. Sex was significant with a positive sign, which is related to the literature review, where was established that women have a higher probability of using medical services. According to the odds value, being female increase the odds of using private physician services in 1.5.

Table 6 Logistic Regression Results of Model Predicting Use of Private versus Public Physician Services among elders in Chile.

Variable	Coefficient	z-statistics	Prob	Odds Ratio
C	-2.1134	-2.2019	0.0277*	0.1208
EDU1 (primary education)	0.0536	0.1831	0.8547	1.0550
EDU2 (secondary education)	0.5173	1.6616	0.0966	1.6774
EDU3 (Technical education)	1.2027	3.0978	0.0019*	3.3290
EDU4 (University)	1.6147	4.4569	0.0000*	5.0263
AGE	0.0177	1.5716	0.1160	1.0178
SEX	0.4405	2.8261	0.0047*	1.5534
MT1	-0.0888	-0.3745	0.7080	0.9150
MT2	-0.3344	-1.2746	0.2024	0.7157
MT3	-0.1118	-0.3168	0.7514	0.8942
HINC	7.62E-10	-0.8962	0.3701	1
PE	1.41E-08	3.4798	0.0005*	1
RE1	1.0163	1.1022	0.2355	2.7629
RE2	-0.0269	-0.0525	0.9581	0.9734
RE3	-0.2690	-0.4409	0.6592	0.764
RE4	0.3682	1.1506	0.2499	1.4451

Table 6 (Continue)

Variable	Coefficient	z-statistics	Prob	Odds Ratio
RE5	0.6323	2.9002	0.0037*	1.8819
RE6	0.2470	0.6779	0.4978	1.2801
RE7	-0.0172	-0.0512	0.9591	0.9829
RE8	-0.1458	-0.5642	0.5726	0.8643
RE9	-0.0407	-0.1070	0.9148	0.9601
RE10	-0.1390	-0.4344	0.6640	0.8702
RE11	-0.1473	-0.0990	0.9211	0.8630
RE12	0.1837	0.2078	0.8353	1.2016
EXPENDITURE	-4.13E-07	-0.0765	0.9390	1
OP1 (percep. of health status: good or reasonable)	-0.3400	-1.2479	0.2121	0.7117
OP2 (percep. of health status: bad or very bad)	-0.6564	-1.9244	0.0543*	0.5187
DG1 (diagnose of chronic condition: 1 chronic condition)	-0.7223	-4.0222	0.0001*	0.4856
DG2 (diagnose of chronic condition: more than 1 chronic condition)	-0.7499	-3.9681	0.0001*	0.4724
DIS (Disability)	0.3345	1.6293	0.1032	1.3972
DAC (Dependency)	0.0099	0.1950	0.8453	1.0099
McFadden R-squared	0.0963			
N	1149			

* Significant coefficient at

Enabling variables are important because, as it was explained before, they could be modified with a redistribution of resources, therefore they have policy implications. Among them, household income was not significant, amount of pension was significant with a positive sign, which means that as pension increases, also does

the probability of using private physician consultations. This is congruent to what has been found in the literature review. Nevertheless, even it has a positive sign, according to its odds ratio, which was equal to 1; there is not change in the odds of using private physician services related to the change in the amount of pension. This could be explained because half of the sample receives $0 of pension and the rest of them receive a low amount of money. Because of this, it is possible to believe that in Chile, is the family who supports the elder when they retire. Therefore one unit change in their pension, do not cause a high change in the probability of using private physician services.

In terms of region of residence, living in the 5th Region was significant. Reside in any other regions of the country was not significant. Living in the 5th Region increases the odds of using private physician's services in 1.9. Expenditure on physician services was not significant.

Need variables are related to illness levels perceived and diagnoses, therefore the modification in this area can be done mainly trough education, prevention and avoidance of risk factors in daily life activities. Having a bad perception of its own health status was significant and decreases the odds of using physician services by 0.5. Also diagnoses of one chronic condition and more than one chronic condition were significant coefficients. Its odds ratios indicates that having one chronic condition decrease the odds of using private physician services by 0.48 and having more than one chronic condition decreases the odds of using private physician services by 0.47. This could be explained because those elders with a bad perception of their health and with diagnoses of chronic conditions will tend to use more physician services, than those with a good health. Therefore, they would prefer to use the services of the public sector, which is free for them, rather than the private sector.

The previous point can be related with the economic implication for the elderly and his family when they use physician services. Half of the sample does not receive any pension, which means that the elderly himself do not have any income. Consequently, the monetary support for the elderly comes from the members of his family.

According to the results showed in Table 6, more ill elderly will tend to use public physician services rather than private services. The reason of this might be explained because when the elderly get ill and need physician services it implies an economic burden, which gets even higher when they decide to utilize physician services form the private sector. If the elderly have more illnesses they will use physician services more often, generating a higher expenditure. This economic cost does not only affect the elderly, but also their families, therefore when they have to take the decision of using the services form the public or private sector, they will be more likely to use public services.

Dependency in daily life activities was not significant in this data set. Which may indicate that there are other factors not only related with the auto perceived and diagnoses health status that determine the use of private physicians by the elderly. Which give rise to the concern about the equity in the access and distribution of health services in Chile.

It is important to notice, that again in this model of private versus public physician utilization, the variables related with the higher increase in the odds of private physicians' utilization where related to education. This can be interpreted as an important policy implication, because as the country moves toward a more developed stage, the education of its population will also increase. Therefore, it is possible to expect that the health demands of the Chilean elders will increase as their educational level increases.

5.4 Comparison between the Model of Use or not Use of Physician Services and the Model of Private versus Public Physicians Utilization.

One of the primary questions that motivated this study was related to the difference between those factors that determine the use of physicians (either public or private sector), with those factors that determine the use of private over public physicians. Therefore, in the following paragraphs there will be analyzed both

previous models together and they will be contrasted with the results obtained by previous studies.

In both models, education was significant. All 4 educational levels were determinants in the decision of using physician services, but only the higher educational levels were significant when deciding to use private physician services. This could be compared with other studies. For example, a study conducted in Manitoba, Canada shows that low health service utilization was related to low educational levels (Shapiro and Ross, 1985). Nevertheless, this result can also be contrasted with the study by Fernandez-Olano, et al (2006), which found that higher health service utilization was related with lower educational level in Albacete Spain. In the case of this particular study, as it was stated before, high educational level increases the probability of physician services utilization by the elderly in Chile.

Sex was significant in both equations, but it increases more the odds in terms of using private physicians than in the equation about the decision of use or not use physician services. In the study conducted by Tarler, et al. (1988) it was found that sex and other predisposing variables have a low effect in the decision of use physician services.

Enabling factors have showed in some studies to have the greater impact in health services utilization (Burnette and Mui, 1999). In the case of this study, the amount of pension was significant only in the decision of using private providers, but it was not significant in the decision of use or not to use physician services.

In terms of region of residence, living in the 5th Region increases the odds of using physicians from the private sector. This Region has the highest amount of physicians per inhabitant after the Metropolitan Region. In terms of using or not using physicians, living in the south of the country has decreased their utilization. This can be explained because these Regions have the lowest number of physicians per inhabitants. According to Parboosingh & Larsen (1987), the amount of suppliers; represented in this study by each region; were important predictors of the use of health services.

Need factors, represented as own perception of health status and presence of chronic conditions, showed to be significant in the decision of using physician services. When the elderly classified his or her health as good or reasonable it was significant in the decision of using physician services. When health was perceived as bad or very bad this was significant in the decision using the services but it decreases its utilization from the private sector. The reason of this might be explained because those elderly who were more ill will tend to use more physician services, therefore, using them from the private sector implies a high expenditure in comparison to using them from the public sector where services are provided free of charge.

Diagnoses of chronic conditions were also an important determinant, especially when having more than one chronic condition; which increases the probability of using physician services, but decreases the probability of using them from the private sector. When comparing these results with previous studies, it can be found that need factors have been broadly used to explained and predict health services utilization (Evashwick, et al.,1984), (Tarler, et.al, 1988), (Foreman, Yu, Barley & Chen, 1998), (Yam, Mercer, Wong, Chan & Yeoh, 2009) .

By the other hand, the study also consider as need factors disability and dependency in daily life activities, nevertheless these two variables were not significant in the data set. Which may indicates that services are not delivered in relation to these variables, but in relation to other factors. It may also indicates that the elderly with dependency and disability in Chile find support from other sources different than the formal health sector.

CHAPTER VI

CONCLUSIONS

6.1 Summary

The aim of this study was to explain the factors that determine specialist physician services' utilization among the elderly in Chile and to analyze the factors that determine the use of private versus public physicians. In this context, Chilean governments have established the provision of health services free of charge in the public sector for all public insured elders. Even after the implementation of this policy, 40% of the elderly used private physicians when they needed physician services in the year 2006.

To develop this research it was used data from the Social Protection Survey version 2006, which represents the whole country population. From the total sample of this survey only those observations who were 65 years or more and who were beneficiaries of the public insurance system were selected.

Using logistic regression two models where estimated, one to analyze the use or non-use of physicians and the second to establish the determinants of using private versus public physicians.

Education was significant in both models. All educational levels were significant in the decision of using physician services, nevertheless only the higher educational levels were significant when deciding to use private physicians. Sex was significant in both equations, but it increases more the probability in terms of using private physicians than in the equation about the decision of use or not use physician services. Therefore, being female increases the chances of using physician services. Age and marital status were not significant.

In terms of enabling factors, household income, expenditure and amount of pension were not significant in the use of physician services. The relation between these variables and the utilization of physician services is complex. The data used for this study does not allowed to make any conclusion or investigate this relationship

further. Amount of pension was significant in the decision of using physicians from the private sector. Living in the deep south of the country decrease the utilization of physician services. This can be explained because these Regions have the lowest number of physicians per inhabitants. By the other hand, living in the 5th Region increases the probability of using physicians from the private sector. This Region has the highest amount of physicians per inhabitant.

Finally, need factors were significant in the decision of using physician services. When the elderly classified his or her health as good, reasonable, bad or very bad it was significant in the decision of using physician services. When health was perceived as bad or very bad it was significant with a negative sign in the decision of using the services from the private sector. Diagnoses of chronic conditions were also significant, especially when having more than one chronic condition; which increases the probability of using physician services, but decreases the probability of using them from the private sector.

The study also considers as need factors disability and dependency in daily life activities, but these variables were not significant in the data set. In terms of equity this is an important finding. Equity in the access of health services can be understood according to which factors determine their utilization. Therefore, there is equity in the access to health services when need variables explain their utilization. There is inequity when other factors different than the need of health services determine their utilization. From this perspective, there might be lack on equity in the delivery of physician services in Chile.

6.2 Policy Recommendations

Policy implications of this work are related to the improvement of the quality of life for the elderly in Chile. Accordingly, if Chilean government wants to provide health services free of charge to the elderly, it needs to be prepared for the increasing demand that will create the higher educational level of the society. Moreover, if the

goal is to provide services fairly, it needs to give more attention to factors related to the need of services, which will increase their utilization.

In addition it has been proved that people in the most isolated regions use less physician services, for that reason it needs to be implemented a more effective system to distribute health resources trough the country.

If government wants to decrease utilization among the elderly it needs to improve their health perception, which can be done trough prevention and avoidance of risk behavior and trough the encouragement of a healthy life style.

The economic situation of the elderly has shown to be an important determinant in their health services utilization by previous researches. It is important to consider in this study, that more than half of the elderly in Chile do not receive any pension; therefore the aid to support them selves comes from other sources, mainly from the support of their families. In Chile, health care for the elderly beneficiary of the public insurance is free of charge when they use public providers. Thus, health care funding should not be a barrier for the access to the services, nevertheless, services has been questioned in terms of equity and quality. Therefore, an important consideration in this respect is related to the achievement of certain quality standards on the services and an equitable ac6cess to all the population in need.

This point is important because means that the government should be prepared to provide an increasing number of health services when the population gets older because it is expected that when the age increases, the number of chronic diseases also increases and the perception of health status tend to be more negative which, according to the results, will increase the utilization of public sector. In addition, if the government wants to decrease the utilization of health services from the public sector should provide a wider pension system that targets a higher percentage of the elderly population and help to decrease the burden to those families with elderly members.

Researches like this are an important source of information to monitor health services utilization and access to the population. This research has raised the mismatch between the need of services and the utilization of the health services by the

elderly. It was proven that the use of health services was determined not only by the need, but also by other factors not related with the individual's health status. This stresses the concern towards the equity in Chilean health delivery system, which is a very important consideration for future health care policies. It is expected that the findings of this research could be used as a modest contribution for the improvement of health access to the elderly in Chile.

6.3 Limitations and Suggestions for further study

This study has had limitations in terms of time, length and availability of data. More precise information about aspects as quality of services, believes and concerns related to health status would be useful information to determine other factors related to health services utilization.

It would be interesting to establish in further investigations health utilization according to different age groups, especially to establish differences among the old and the very old. Also to include other kind of services such as hospitalization, which entails a high economic burden to the patient. Another important aspect to be studied would be the determinants of the utilization of long-term services, formal and informal which is a topic of high importance because of the increasing number of elderly population in Chile, but there are not studies in this area.

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APPENDIX

Table A1 Selected questions from Social Protection Survey used in the study

Number	Question	Possible Answers	Variable
F20_02	Have you gone for medical attention in the last two years?	Yes No Don't remember	Use or non-use of physician consultations
F33	Think about your last visit to a doctor… In what type of establishment were you attended?	General clinic (public) Rural clinic (public) Specialist clinic (public) Public Hospital Establishment of Army Clinic or Medical Center (Private) Mobile Emergency Service (Private) Occupational Accident Mutual Society Other	Use or non use of private providers when using physician consultations
A12n	What is your educational level?	None (illiterate) Nursery Preparatory or high school old system Primary education Differential education Humanities (old system) Technical College Graduate	Educational Level
A9	How old are you?	Number	Age
A8	Sex	1. Male 2. Female	Sex

Table A1 (Continue)

Number	Question	Possible Answers	Variable
A5b	What is your current marital status?	Married Consensual union Separated Widowed Single Divorced	Marital Status
C3	In your main occupation, what was your average net remuneration in the last 12 months?	Amount in pesos	Household income
C19_1	How much have you received monthly in the last 12 month from retirement?	Amount in pesos	Amount of pension
Region	In which region do you live?	Numeric value between 1 and 13	Region of residence
F22a_2	How much did you have to pay the last consultation?	Amount in pesos	Expenditure on physician services
F34	How many days passed between when you asked for an appointment and the moment you were attended?	Amount in days	Waiting time for an appointment
A10	How would you describe your health?	Excellent Very good Good Reasonable Bad Very bad Don't know	Own perception of health status

Table A1 (Continue)

Number	Question	Possible Answers	Variable
F40	Have any of the following medical conditions been diagnosed by a doctor?		Diagnosis of chronic illnesses
F40_01	Asthma or Emphysema	Yes No	Diagnosis of chronic illnesses
F40_02	Depression	Yes No Yes No	Diagnosis of chronic illnesses
F40_03	Diabetes	Yes No	Diagnosis of chronic illnesses
F40_04	Hypertension or High blood pressure	Yes No	Diagnosis of chronic illnesses
F40_05	Cardiac problems	Yes No	Diagnosis of chronic illnesses
F40_06	Cancer	Yes No	Diagnosis of chronic illnesses
F40_07	Arthritis or Arthrosis	Yes No	Diagnosis of chronic illnesses
F40_08	Renal Disease	Yes No	Diagnosis of chronic illnesses
F40_09	Brain Hemorrhage	Yes No	Diagnosis of chronic illnesses
F40_0A	Mental Illness	Yes No	Diagnosis of chronic illnesses
F40_0B	HIV AIDS	Yes No	Diagnosis of chronic illnesses
F37	Do you have any type of incapacity or disability?	Yes No	Presence of disability
F38	What type of handicap or disability do you have?		Presence of disability

Table A1 (Continue)

Number	Question	Possible Answers	Variable
F38.1	Hearing disability	Yes No	Presence of disability
F38.2	Speaking disability	Yes No	Presence of disability
F38.3	Visual disability	Yes No	Presence of disability
F38.4	Mental disability	Yes No	Presence of disability
F38.5	Physical disability	Yes No	Presence of disability
F38.6	Psychiatric disability	Yes No	Presence of disability
F38.7	Other	Yes No	Presence of disability
F38.e	Specify	Yes No	Presence of disability
F18	Do you habitually need help or have difficulty doing the following activities?		Dependency in daily life activities
F18_01	Demanding or intense exercise	Yes No	Dependency in daily life activities
F18_02	Walking long distances	Yes No	Dependency in daily life activities
F18_03	Going up stairs	Yes No	Dependency in daily life activities
F18_04	Bathing	Yes No	Dependency in daily life activities
F18_05	Getting dressed	Yes No	Dependency in daily life activities

Table A1 (Continue)

Number	Question	Possible Answers	Variable
F18_06	Eating	Yes No	Dependency in daily life activities
F18_07	Getting out of bed	Yes No	Dependency in daily life activities
F18_08	I do not need help for any of the above	Yes No	Dependency in daily life activities

Table A2 Estimation of Expenditure (Logarithm) on physician services as Dependent Variable ($EX_{physician}$).

Variable	Coefficient	t-Statistic	Prob
C	7.9781	15.1614	0.0000*
AGE	0.0124	1.7694	0.0777
SEX	-0.0474	-0.4475	0.6547
REGION 1	0.1276	0.1926	0.8473
REGION 2	0.2762	0.9886	0.3236
REGION 3	0.2571	0.7188	0.4727
REGION 4	-0.1033	-0.5046	0.6141
REION 5	-0.0445	-0.2741	0.7841
REGION 6	0.6639	3.1598	0.0017*
REGION 7	0.4131	2.1144	0.0352*
REGION 8	-0.1630	-0.9822	0.3267
REGION 9	0.2453	1.1068	0.2691
REGION 10	0.2206	0.8535	0.3939
ASTHMA	0.1846	1.0446	0.2969
DEPRESSION	0.1908	1.4034	0.1614
DIABETES	0.1986	1.4244	0.1552
HYPERTENSION	-0.1642	-1.5940	0.1118
CARDIAC	0.1375	1.1633	0.2455
CANCER	-0.0420	-0.1700	0.8650
ARTRITIS	0.0978	0.8399	0.4015
RENAL	0.3817	1.7784	0.0762
BRAIN	0.0368	0.1423	0.8869
R-squared	0.0980		
N (adjusted)	992		

*Significant Coefficients at 5%.

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