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HEALTH INSURANCE IN PERU AND THE BARRIERS FOR ITS ACCESS

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Abstract

In this paper we analyze why some part of the Peruvian population does not have any kind of insurance. The previous literature presents the existence of different kinds of barriers that impede this access, for example the economic resources, the lack of labor benefits in the job, the level of education, the cultural aspects, the geographic situation, among others. To analyze the characteristics of the uninsured in Peru, first we have to explain the structure of the Peruvian Health Insurance system where three different regimes exist; the subsidized by the government, the social security system, and the private system; second, we present the hypothesis and the theoretical framework; third a quantitative analysis is made using the Peruvian National Household Survey, ENAHO 2007, to test the hypothesis through an econometric model. We find that the barriers exist, but the interpretation of the results is different regarding the group of population we take into account, urban-rural or poor-no poor. Finally, we present the main conclusions of the research and some policy implications.

1. Introduction

In Peru around 59% of the population does not have any kind of health insurance. Our argument would be incomplete if we tried to explain this high percentage only by stating that Peru is a developing country with low levels of public health expenditure where not all the population has the means to access insurance. Economic limitations might be only one reason to account for the existence of uninsured people.

In fact, when examining the Peruvian Health Insurance system, we recognize that one of the three main regimes seeks to insure the population with no (or very few) economic means to access any kind of contributive insurance. This first actor is: (i) The Integral Health Insurance (SIS), which provides health care and health insurance to those who cannot access them for economic reasons. SIS is subsidized by the Peruvian Government and run by The Ministry of Health (MINSA). MINSA also plays the role of regulator for the entire system. The second actor is (ii) The Social Security System, which is formed by public and private providers since the health reform of 1997. In this system, all dependent workers should receive health insurance from their employer. Therefore, no matter the income level of the worker, they all are actually insured by the firm. In this system, the first problem

arises when the worker is independent. In that situation, the worker himself has to contribute to the social security, but his income might not be high enough to do so. The second problem arises when, in the case of dependent workers, the firm cannot afford to insure its employees. This is the main characteristic of informal jobs, a very typical problem in Latin America. This is why an individual can have a job and receive earnings, but he does not have the right to access labor health benefits, that is, insurance. The Peruvian Government tried to expand the insured percentage of workers by creating a mixed Social Security System. The public actor in this system is ESSALUD, a Decentralized Public Agency (OPD) with the objective of providing assistance to all its contributors in highly complex health problems and situations with low occurrence rates. Private actors are EPS, firms that represent an option for more common and less complex health problems. In these cases, workers can also choose to get assistance from ESSALUD instead of from an EPS. iii) Finally, the private sector comprises general insurance companies, private clinics and other institutions offering health plans of both high quality and cost. The private sector is concentrated in high income segments of the population. This structure of the health system is common in other countries of Latin America, for example the existence of a private-public contributive system is characteristic in Chile and Colombia, while a subsidized regime, focused on individuals with low incomes is present in Bolivia and Mexico.

But low income and the informal nature of a job are not the only determinants in the existence of uninsured people; lack of education prevents individuals from recognizing the benefits of having health insurance or even being aware of the existence of accessible insurance, like SIS. Additionally, an individual's cultural background can influence his decision of being insured and where to go when looking for professional health assistance. For instance, people with Indian roots prefer traditional medicine when it comes to taking care of their health problems. Geographic location can also influence the existence of insured people. In the case of Peru, the Highlands concentrate people with Indian roots, who live in poverty, but the proportion of people insured by SIS is higher¹ than in other regions.

In the following sections, we present the situation of the Peruvian economy and the Peruvian Health System. We further detail the characteristics that determine the existence of uninsured people in Peru, and present the structure of the economic

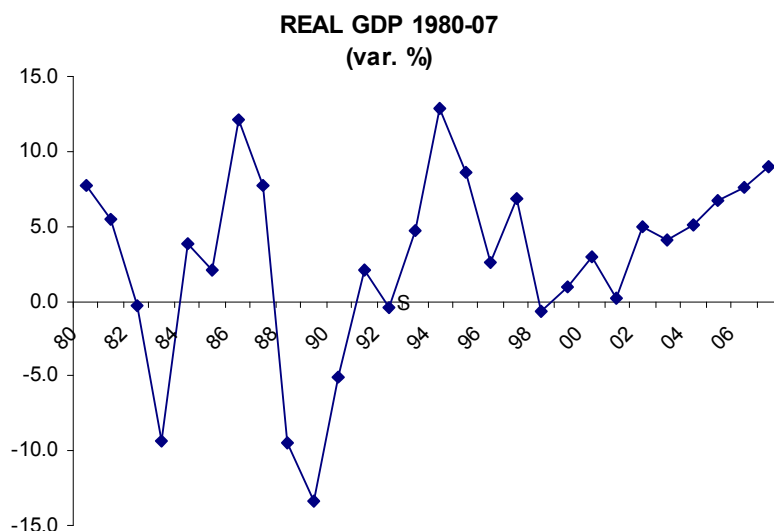
¹ SIS is focused in regions with the highest poverty levels.

model used to analyze this topic. Finally, the discussion will be complemented with a quantitative analysis using the Peruvian National Household Survey, ENAHO 2007, which is a monthly survey produced by INEI (Peruvian National Institute of Statistics and Informatics). We test the hypothesis through a descriptive and econometric analysis econometric estimation, where the influence of all the above explained factors determines the probability of being insured.

2. Peruvian Economic Background

Peru is a developing country currently experiencing a period of remarkable economic growth. This good performance in terms of economic policy started at the beginning of this century and Peru seems to be going through a period of steady growth, as opposed to the very unstable period experienced during the eighties and part of the nineties. After the application of important stabilization policies in the economic and social fronts, the promotion of foreign investment, the recovery of private consumption, among other important aspects, Peru left behind times of GDP volatility and hyperinflation², and entered a period of steady economic growth, with low inflation and a solid currency.

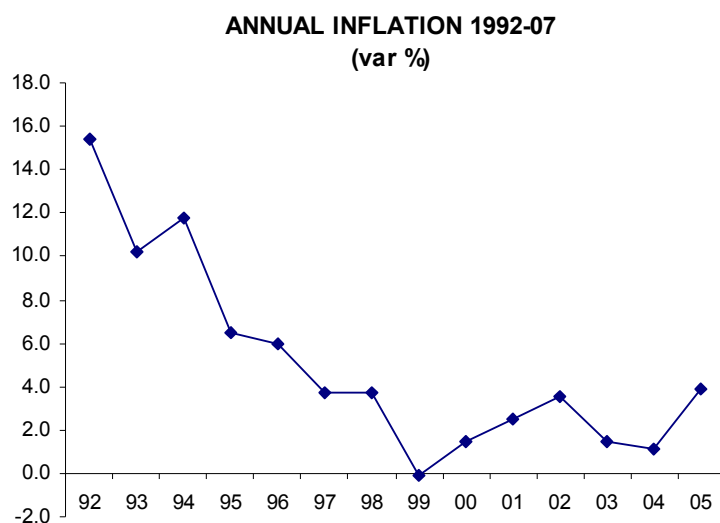
Figure N°1



Source: Peruvian Central Bank

² The Annual Variation of the CPI was 7650% in 1990, see www.bcrp.gob.pe

Figure N°2



Source: Peruvian Central Bank

In spite of good macroeconomic perspectives, the situation of certain sectors of the population is quite different, giving the impression that the benefits of growth have not already reached the entire population, especially the poorest. In order to take the country out of the crisis, the government had to implement many liberal reforms during the nineties, aiming at an economic recovery. However, these measures do not help the poor and extremely poor population. Social policies are not enough to achieve a faster improvement of the living standards. In this context, the situation of the population is not in line with the high growth rates registered during the last years.

Table N°1

HUMAN DEVELOPMENT INDEX

	IDH	Live Expectancy in years	Adult Literacy rate	School enlorment ratio	GDP per capita (PPP US\$)
United States	0.951	77.9	100	93.3	41890
Argentina	0.869	74.8	97.2	89.7	14280
Chile	0.867	78.3	95.7	82.9	12027
Mexico	0.829	75.6	91.6	75.6	10751
Peru	0.773	70.7	87.9	85.8	6039
Bolivia	0.695	64.7	86.7	86	2819

Source: PAHO

As shown in the table above, Peru does not have high human development indicators; in fact the country is ranked 87th out of 177 countries (www.undp.org).

3. The health sector in Peru

One of the liberal policies implemented to reactivate the Peruvian economy at the beginning of the nineties was the reduction of the fiscal deficit. Therefore, current public expenditure suffered an important cut down: in 1987 it had an index value of 94,³ which was reduced to 29 in 1991 (Verdera 1997). The reduction of public expenditure affected, of course, public health expenditure. As a consequence, nowadays resources are not enough to cover all the needs of the population.

As shown in the table below, Peru is still in disadvantage in terms of health infrastructure and other health indicators, compared to other countries of the region. This gives insights that there are still problems with the supply of health facilities.

Table N°2
HEALTH RESOURCES

	Physician for 10000 hab.	Infant Mortality	Public Health Expenditure, as % of the GDP
Argentina	32.1	13.3	3.5
Bolivia	7.6	54	4.2
Chile	9.4	7.9	3.9
Mexico	10.4	18.8	2.4
Peru	10	28.1	2.3
United States	22.5	6.8	7.4

Source: PAHO

The structure of the Peruvian health system, as mentioned in the introduction, is formed by three actors or regimes; the subsidized regime, the contributive regime, formed by a public-private Social Security system and the private system. This structure is a product of the sector reforms made in 1997 and the creation of subsidized insurance providers in 2001.

³ The base year is 1979

4. Health system reforms

In 1997 the Peruvian Government introduced the reform of the Social Security System, allowing the participation of the private sector. Until that year, the Social Security system was led only by a public organism, called IPSS by the time, which also administrated retirement funds.

Because of the lack of quality in the service, huge waiting lists and the lack of personnel, the social security system became very unpopular in Peru by the end of the eighties. Therefore, reforms were introduced to improve the efficiency of the system. The main reforms were the following: 1. IPSS stopped paying pensions; 2. the Law of Social Security Modernization created EPS; 3. in 1999 IPSS changed its name to ESSALUD, through the Law for the Creation of the Health Social Security; and 4. The Superintendence of Healthcare Providers (SEPS) is created with the aim of promoting, allowing, regulating and supervising the functioning of EPS and monitoring the proper use of resources.

5. The Structure of the System

5.1 The subsidized regime: MINSA-SIS

In this regime the Government plays the main role through MINSA⁴, that regulates, promotes, and subsidizes (totally and partially) the services. The target population is formed by individuals living under poverty conditions⁵ in an age range that does not allow them to generate any work-income and who do not have access to any other kind of insurance.

To become a SIS beneficiary, potential users go through a socioeconomic evaluation that can be undertaken in every SIS office.⁶ In theory, the subsidized regime covers all kind of illnesses; however, in reality this depends on the resources available in each health facility or hospital.

⁴ The Military forces and the police have also a health insurance subsidy.

⁵ For 2007, the poverty line was defined by the National Statistics Institute (INEI) in S/.229,4 (49,8 Euros) per person and the extreme poverty line was defined in S/.121,2 (26,33 Euros) per person.

⁶ Since the socioeconomic evaluation made by SIS is different from that made by INEI, we can find SIS users that are categorized as non-poor in ENAHO.

SIS was created in 2001 as a decentralized public agency (OPD) and it is the result of the fusion of two former insurance systems: The School Insurance (SEG) and the Mother-Child Insurance (SMI). SEG used to be focused on providing health attention in public hospitals to children attending school between the ages of 3 and 17, while SMI was focused on covering pregnant women until 8 weeks after labor; and children up to four years old. According to D.S 009-2002 SA (Parodi 2005; www.sis.gob.pe) the main objectives of SIS are:

- Building a sustainable public insurance system to finance quality services for the improvement of the health situation of the population through the reduction of mortality.
- Promoting equal access for the uninsured population to quality health services, especially to vulnerable groups and those living under poverty and extreme poverty situations.
- Implement policies that generate an insurance culture among the population.

The expansion of the mother-child component coverage to a national scale is one of the main and most positive changes generated by the fusion of SEG and SMI. The other two main changes are: the elimination of the requirement for children to attend a public school; and the possibility to access health services different from those related to maternal-child aspects. (Parodi 2005)

SIS offers two products, the Free Insurance and the Minimum Cost Insurance.

Table N°3

Free Insurance	Minimum Cost Insurance
<p><i>Target Population:</i> Peruvian families or citizens living under poverty or extreme poverty conditions and whom do not have any insurance.</p>	<p><i>Target Population:</i> Peruvian families or citizens with a monthly labor income below S/.1000 ⁷ and below S/.1600 if the worker has a non-personal services contract (that means hiring independent workers without labor benefits and for a limited period of time).</p>
<p><i>Cost:</i> It is free.</p>	<p><i>Cost:</i> In the case of individual coverage, the cost is: - S/. 10 per month if the monthly labor income is below S/. 700.- S/. 20 per month if the monthly labor income is between S/.700 and S/.1000 (below S/. 1600 in the case of non - personal services). In the case of family coverage (including husband/wife or out-marriage par and children below the age of 18) the monthly cost is S/.30.</p>
<p><i>Enrollment:</i> Subject to socioeconomic evaluation</p>	
<p><i>Services covered:</i></p> <ul style="list-style-type: none"> Preventive health services General and specialized medical examinations Surgery and post-surgery attention Emergency services Maternity services Transport for medical purposes up to S/. 630 Burial expenses up to S/. 1000 	

Source: SIS, www.sis.gob.pe

⁷ The Exchange rate Sol-Euro by August 2008 is 1 Euro for 4.25 Soles

Vera (2003) outlines one of the first balances made on the effects of SIS. He finds that many families and individuals with very few economic resources started accessing professional health care through SIS. He also mentions that the Government is changing its subsidy focalization policy from supply to demand.

On the other side, he points at the need of expanding coverage, especially in areas where there is a largest concentration of poverty. Parodi (2005) also founds that several non-economic barriers (geographic, cultural, household leadership, a not adequate treatment from the health personnel) are still in place, limiting the access to SIS for maternal care.

5.2 The Social Security Regime (Contributive Regime)

The Peruvian Social Security is a contributive mixed regime that provides health care to dependent workers and their families and independent workers. The providers of the service are ESSALUD (public) and, from 1997, EPS (private) through affiliated institutions. One of the objectives of the reform in 1997 was to diminish the congestion of the services provided by ESSALUD and introduce a better quality option for workers and voluntary contributors through EPS. Thus, from 1997 on, firms can offer their employees a new health insurance option, characterized by its high quality, but also higher costs.

In fact, EPS was created to complement, as well as substitute the role of ESSALUD.

- EPS complements ESSALUD in the way that the first one is in charge of providing attention in *Simple Layer* services, and ESSALUD is in charge of providing attention in *Complex Layer* services. *Simple layer* is a list of illnesses of high frequency and low complexity, which imply a low cost of recovering. *Complex layer* considers, on the contrary, illnesses that are less frequent and highly complex, but which also imply a higher cost. Therefore, if the firm has the economic means and employees agree, the services of an EPS can be hired to get *Simple Layer* assistance and at the same time access ESSALUD and its *Complex Layer* coverage.
- EPS substitutes ESSALUD because a user can choose between either of them to get health care attention. Users can choose between ESSALUD and an institution associated to an EPS as a *Simple layer* service provider. When the

firm or the independent worker cannot pay for the services of an EPS, ESSALUD remains as the option for *Simple Layer* attention. Finally, although ESSALUD provides *Complex Layer* assistance, *complex layer* services can also be provided by an EPS, but in this case, coverage is up to an amount specified in each particular insurance plan, leaving the rest to be paid by the insured individual.

These institutions require a compulsory contribution from all their members. In the case of payroll workers, employers should pay for that contribution (9% of the wage). ESSALUD also offers health services to retired pensioners, who pay 4% of their monthly pension. When the firm chooses the service of an EPS, 25% of the contribution (2.25% of the wage) goes to the EPS and the other 75% goes to ESSALUD (6.75% of the wage). In the case of voluntary contributions, each individual is responsible for paying for his or her membership by themselves.

Before the reform, social security was entirely constituted by IPSS (The Peruvian Institute of Social Security). IPSS concentrated both Simple and Complex Layer Services. Meanwhile, the private sector participated only through private insurance companies that were not a part of the Social Security system and did not have any link with IPSS. Following the reform, the private sector entered the Social Security system through EPS. This is why today 25% of the contribution of the employer goes to an EPS and the remaining 75% goes to ESSALUD. With the reform, an employee gets to choose where to get *Simple Layer* assistance: either ESSALUD or in an institution associated to the selected EPS. Therefore, ESSALUD was released from providing all insured workers with *Simple Layer* services. In the case of *Complex Layer* services, ESSALUD remains as the main provider and in the case of EPS users, additional payments are required to cover the entire cost.

The following diagram presents the main changes derived from the introduction of EPS.

Figure N°3

Before the Reform

IPSS (9% of the wage)	Insurance Firms (additional prime)
Focus on both: Simple and Complex Layer	Focus on both: Simple and Complex Layer

After the Reform

ESSALUD (6.75% of the wage)	EPS (2.25% of the wage)
Main Focus on: Complex Layer	Main Focus on: Simple Layer
Optional: Simple Layer if not EPS access	Optional: Complex Layer extra payment

Source: APOYO Consultoria

5.2.1 The Contributive Regime : ESSALUD

ESSALUD still has the largest portion of coverage in the Social Security system, around 95%.

The main product offered by ESSALUD is the regular insurance, which is offered to all its members and their families. Additionally, there are other kinds of plans:

Insurance for the independent Fisherman, Agrarian Insurance, Risk Insurance , and Facultative Insurance.

Regular Insurance provides health care to dependent workers, household workers and pensioners, all of whom have the right to receive health, economic welfare and social provisions (www.essalud.gob.pe).

- Health provisions cover all the medical services provided by ESSALUD. These include health prevention and promotion activities and recovery related activities (medical examinations, hospitalization, medications, rehabilitation, orthopedic devices).
- Economic provisions cover the needs of users through a fixed amount and for a fixed period of time in cases of temporary disability, maternity, breast-feeding, and burial.
- Welfare and social promotion provisions cover social aid and rehabilitation for work.

The performance of ESSALUD reveals the system has many strengths but also some weaknesses. On the one hand, ESSALUD has control over its cost structure because of the independence of its service network; it is present in every region; it has achieved economies of scale in terms of technology investment, and provision of medications. On the other hand, coordination activities are not optimal between all the health facilities; a lot of members are not satisfied with the service and therefore an important fraction of them does not choose ESSALUD for assistance. Finally, members cannot choose a specific health center; since it is assigned depending on an individual's home addresses.

5.2.2 The contributive Regime: EPS

EPS are firms, different from ESSALUD, that offer health services using their own infrastructure or that from other affiliated institutions (private clinics or specialized centers).

Their main objective is to become a different option in the provision of *Simple Layer* services for independent and dependent workers. The provision of *Complex Layer* is

possible through the EPS modality, but, depending on the plan, a co-payment is required.

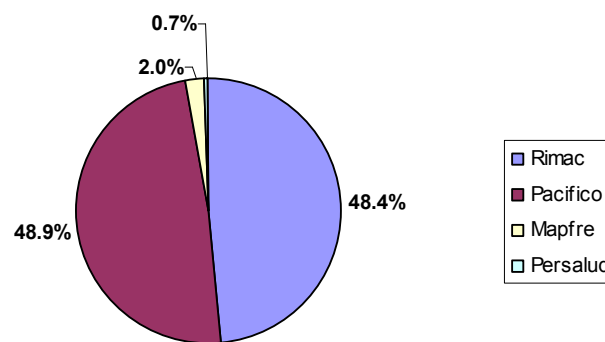
The affiliation to a specific EPS is decided through an election process within firms. Employees choose among all the EPS that offer their services to the company.

In the case of independent workers, they can hire the service in the form of facultative insurance. In order to do so, the worker personally contacts his EPS of choice and reaches an agreement on the plan and benefits.

Currently there are four EPS with different market shares. Three of them are general insurance firms (Rimac, Pacifico and Mapfre), which also offer other health insurance plans outside the social security regime. (see next section)

Figure N°4

**EPS Market Share
(March 2008)**



Source: SEPS

Table N°4

**EPS Market Share
(March 2008)**

	N	%
Rimac	402537	48.4
Pacifico	406858	48.9
Mapfre	16556	2.0
Persalud	5691	0.7
Total	831642	100

Source: SEPS

A regulatory agency was created to monitor the proper functioning of EPS: SEPS – The Superintendence of Health Care Providers, created in 1999 through law N° 26790 (Law for the modernization of the Health Social Security). The objective of SEPS is to authorize, regulate and supervise the functioning of EPS and the proper use of the funds they administrate.

The main advantages of EPS are: (i) Important benefits for patients (shorter waiting periods of time for medical examinations, wide variety of medical centers, the opportunity to access house call services, among others); (ii) both the quality of medical attention and the quality of service⁸ in an EPS are better than in ESSALUD (iii) employees do not have to pay for a service from their own resources and they have the possibility of choosing the EPS. On the other side, some of the weaknesses of EPS are: (i) they have not had an important influence on the expansion of health care coverage because of their high costs, and (ii) the supply of health centers in cities apart from the capital, Lima, is still too limited to develop the service in those places.

5.2.3 Private insurance outside the social security system

Finally, there are also private insurance plans different from EPS that are outside the Social Security system and are paid directly by the individuals hiring the service. These plans are provided by large general insurance companies through affiliate institutions and private clinics. The target clients of these companies are high income individuals, retired people, or institutions that want to offer insurance to individuals related to them. For instance, some universities and schools offer private insurance plans to their students.

The main characteristics of private plans are:

- Fixed annual coverage per person
- Premiums increase with age
- Age limits for affiliation
- Existing conditions at the moment of the contract are not covered.

⁸ Quality refers to receive a fast assistance, respect from the personnel; finding also physicians and nurses with professional capacity, and adequate infrastructure in the health centers.

In summary, these private systems are accessible only by a small part of the population (around 2.7 %): those who have high levels of income and can afford the service.

6. Problem assessment

Regarding the main problems of the system, we can identify the absence of equity, solidarity and eligibility (García 2002). First, equity⁹ is absent because there is still a part of the low income population that is not able to select its health care provider, they can only access the services provided by MINSA. However, these individuals cannot pay for medication or required treatment. On the other side of the spectrum, the high income segment of the population can access good quality services provided by private clinics. Besides, to access the social security system (ESSALUD-EPS) an individual needs either to be employed or have the economic means to pay for a voluntary insurance. Secondly, solidarity¹⁰ is present in the Social Security system since payments are carried out by the employer in the case of dependent workers. Therefore, for different levels of wages, an individual can access the same service. But in the case of SIS, the service is almost completely subsidized by the State. However, under this regime, payment is required for some specific treatments (www.sis.gob.pe). In the case of the private system, there is absolutely no solidarity since the benefits are positively related to the level of income of the users. The more services a plan provides, the more expensive it is.

Despite the reforms, the main objectives are far from being accomplished. Access to health insurance is still not possible for a large proportion of the Peruvian population, 59%. The questions that rise from this fact are: Who are these people? What particular characteristics do they have that are preventing them from having a health insurance plan?, and, what “barriers” do they find?

From the explanation of the structure of the Peruvian Health Insurance system, we can draw some conclusions:

⁹ In this framework, the lack of equity is referred to absence of equal chance for the population to access the whole benefits of the health system.

¹⁰ The solidarity is referred to the possibility that the system offers an equal access to services to persons with different characteristics and needs.

- The sector with a high socio-economic status can hire either expensive plans provided by private firms, or EPS plans as independent workers.
- Social Security is still not accessible to all employees, since not all firms are capable of paying for health plans, especially the ones provided by an EPS. As explained before, hiring an EPS could be very costly. Additionally, these institutions are biased towards servicing large firms. Therefore, only a small part of the population can access that kind of insurance. In the case of ESSALUD, the affiliated population is larger, but still there are workers that cannot access this regime for similar reasons.
- Without high incomes or health benefits at work, the only option to get insurance is the subsidized system: SIS. But, as explained before, this system should be reserved for people of low socio-economic status, who have very low or no income at all.

Therefore, there is still part of the population that does not have enough economic resources and/or does not have a social security plan at work, but is not poor enough to be considered a candidate for SIS.

Next, we set forth some hypothesis derived from all the above, as well as other ones that can help all together explain why a part of the Peruvian population does not have access to any kind of health insurance.

7. Hypothesis

Not having any kind of health insurance can be explained by the presence of some “barriers” that limit the access of an individual to a specific good. In the case of health insurance, the following limitations are identified:

7.1 Economic barriers

As outlined in the sector description, accessing Private insurance is very costly because of the high costs users have to pay. In the case of the Social Security System, there is also a high cost for potential users and firms. They have to pay ESSALUD and/or an EPS to provide their employees with a health insurance plan. Paying social security is sometimes costly for firms, especially in the case of an EPS. This leads to the existence of a labor barrier, which will be explained in the following subsection. In the case of the users that access the social security through

their jobs, they have to incur a cost too: the cost of achieving a certain level of education in order to have the required capacity to be hired by a firm that can provide them with insurance. However, this is not an issue in the case of a total absence of economic resources, since SIS can be accessed by people whose income is too low to have another kind of health insurance.

7.2 Labor Barriers

One important determinant in not accessing a health insurance plan is the informality of the job. There is not a unique definition of informality, but the concept is related to the level of protection and benefits that an employee can obtain from a job. ILO has proposed a definition of what an informal job is: It is either a job in a firm with less than 5 workers, or a job that is carried out independently by non professional workers. In an informal job, employees usually make less than the minimum wage, have low productivity and have no social protection (Saavedra 1998).

According to this definition, informal workers reach 79% of the economically active population. This helps explain the high proportion of uninsured people.

7.3 Non-economic barriers

In countries like Peru, as in many other countries of Latin America, there is still an important proportion of the population that speaks native languages that were born in the Andean cultures (Quechua, Aymara and other dialects used by natives in the jungle). The population that speaks these languages has been estimated in around 7 to 8 millions, around $\frac{1}{4}$ of the entire Peruvian population. As Parodi states, language can be a barrier to receive proper treatment in a health facility. Sometimes, the doctor or nurse does not speak the native language of the patient and the misunderstandings generated by this can have a negative effect on the quality of the service. As a consequence, the patient will not look for professional assistance again, and this also implies not accessing any kind of health insurance.

But this is not only a linguistic problem, as Caldwell (1990) states, there are many cultural traditions that together with low educational levels, promote the use of traditional health methods instead of quality health services.

Finally, it is different to have a male household head than a female household head. As Gómez (2002) states women are in disadvantage in comparison to men at the moment to obtain insurance, since many women are indirectly insured through the marriage with an insured man. When these women became alone, because of divorce, widowhood, desertion; or when the husband becomes uninsured, the women do too.

It is consequence of the gender inequality of access to formal jobs and economic means that many Latin-American women suffer, increasing the probability of being uninsured not only for them but also for their dependents.

Therefore, not having any kind of health insurance is not only generated by a lack of economic means, but also because people are not aware of the benefits of being insured.

8. Theoretical Framework

Different authors have dealt with the issue of an individual or household being able to access a specific good, here, health insurance. In this case, we have to work with non-accessibility, considering the different characteristics of individuals.

One approach was made by Bundorf and Pauly (2006). They propose the analysis of “affordability” using two definitions, *Normative* and *Behavioral*. The first one uses the following theoretical definition:

$$y - p^h \bar{x}^h \geq \bar{G}$$

Where, y is household income

p^h : is the price of the special good, in this case health insurance

\bar{x}^h : is the socially minimum quantity of the special good

And \bar{G} : is the minimum level of spending in other goods.

The main idea is that after the consumption of the special good the individuals must be in capacity to have a minimum spending on other goods.

Then, the minimal income needed to access the special good, \bar{y} , must be:

$$\bar{y} = \bar{G} + p^h \bar{x}^h$$

However, the demand for a special good will not only depend on income, but also on preferences. This leads them to consider a second definition of affordability, the *behavioral affordability*, which could be considered an extension of the normative definition by taking into account the decision of the consumer to buy more quantities of other goods rather than the special good. Then, the demand of the special good can be written as:

$$x^h = (\theta, p, y)$$

where θ is the intensity preference for the special good. Therefore it is affordable if:

$$x^h(\theta_M | y, p) \geq \bar{x}^h$$

That means that the special good is affordable if a consumer can purchase it in an adequate quantity, and if the consumer has a preference for the special good of at least a median preference intensity value of, θ_M , given a level of income and price. In other words, the special good is affordable because the individual can and desires to get it.

The authors link both definitions, by considering the different relationships between the level of income needed to buy both health insurance and other goods (*normative definition*) and the percentage of the population that does afford insurance (*behavioral definition*). They find five possible different relationships:

- Each individual with income y_i below y^* is uninsured, while each individual with income y_i above is insured.
- Individuals are normatively defined as “insured non-afforders” but they may buy at least the target level of coverage, having too little to spend on other goods.
- Individuals are normatively defined as “uninsured afforders” with enough income to be insured and buy an ideal level of other goods, however they do not get enough insurance.

- There are both “insured non afforders” and “uninsured afforders”.
- There are few “insured non afforders” and more “uninsured afforders”.

Using data for United States the authors argue that this last situation is the most common in that country.

The behavioral definition is applied through the estimation of the proportions of individuals that, given a combination of income and price, can afford the target quantity of the good.

That probability is defined by:

$$P_{y,p} = \Pr(z_i = 1 / y, p)$$

And

$$z_i = 1 \text{ if } z_i^* \geq 0$$

$$z_i = 0 \text{ if } z_i^* < 0$$

where z_i^* is the difference between the utility maximizing quantity of health insurance for individual i (given the income and price) and the target quantity of that insurance. To estimate that difference Bundorf and Pauly define a model setting the Index function I^* , which depends on a vector of characteristics X' and an error term ε_i .

$$I^* = X'_i \beta + \varepsilon_i$$

Then the link between z_i and I^* is

$$\Pr(z_i = 1 / X_i) = \Pr(I^* > 0 / X_i) = \Pr(X'_i \beta + \varepsilon_i > 0)$$

With this specification the authors estimate and predict the probability that an individual with a given set of characteristics, income or price, purchases a determinant level of health insurance. Then, with that predicted value, they can define a threshold ¹¹ at a the median preference intensity value of θ_M . Above that threshold, the health insurance is affordable.

¹¹ Bundorf and Pauly set four different thresholds: 0.5, 0.6, 0.7 and 0.8

The authors estimated three different models; the first one estimates the probability of achieving the target quantity of health insurance, introducing income as the explanatory variable. The second model adds both employment status and number of employees at the workplace as proxies for insurance prices, since unemployed individuals or part - time workers obtain expensive insurance plans in comparison to those obtained from the employer. The last model includes other characteristics that are in some way related with income and price, like health status, age, gender, and geographic situation.

However, the authors do not include in their analysis other variables that in their own words are “proxies for tastes” such as education. They explicitly consider this variable as a proxy for taste.

Many other variables that could represent tastes are considered by other authors, for example Mocan et.al (2000) state in their analysis of demand for health in urban China, taking into account Human Capital variables, that higher education should be considered one of the most important determinants in accessing health insurance. Parodi (2002) and Valdivia (2000) also consider geographic location and ethnic background in their analysis, since the demand function must consider these particular characteristics as non-economic barriers to access health insurance.

Considering these references, and particularly, that from Bundorf and Pauly, we present our theoretical model, in order to analyze the reasons that explain why a part of the Peruvian population does not have any kind of health insurance.

First, our model is closer to the *behavioral* approach than to the *normative* approach, since in Peru buying insurance it is not just a matter of expenditure capacity, but also of consumer decisions. Thus, the demand function in the Peruvian case can take the structure presented in Bundorf and Pauly:

$$x^h = (\theta, p, y)$$

Similarly to what the authors present, the demand for insurance in Peru is not perfectly related to income, even it could be negative related in the poorest sectors, because there are preferences that affect the demand in a different way.

Having established the relation between Bundorf and Pauly's and our model, we define the probability of being uninsured in the following way:

$$P_{y,p} = \Pr(z'_i = 1 / y, p)$$

And

$$z'_i = 0 \text{ if } z_i^* > 0$$

$$z'_i = 1 \text{ if } z_i^* \leq 0$$

Then, the probability function has the following form:

$$\Pr(z'_i = 1 / X_i) = \Pr(I^* \leq 0 / X_i) = \Pr(X'_i \beta + \varepsilon_i \leq 0)$$

Since our focus is in those individuals with a negative difference between the utility maximizing quantity and the target quantity of health insurance, our regression has the contrary interpretation in comparison to what the authors state. This implies that the new index-function (I^*) considers this negative difference too.

In vector X' we include monthly expenditure per capita as an income variable; as a proxy of prices, job informality which is similar to Bundorf's and Pauly's proxy; employment type; and finally we include variables that also determine the probability of being uninsured. We differ from Bundorf and Pauly concerning this last point. They just limit themselves to include variable with some kind of relation with income and prices and exclude other variables that they consider related only with tastes, for example education. We include not only education but also size of the household, gender of the household head, geographic situation, Indian roots, diseases in the last month and age.

It is important to remark that we include these variables not only because they just reflect tastes or preferences, but also because they can reflect income capacity. Firstly, in the Peruvian framework the term preferences should be interpreted differently as in the Bundorf and Pauly research. There, preferences could imply a matter of free choice but in the Peruvian case, preferences for other goods rather than insurance could mean lack of knowledge of the importance of being insured. As we stated in section 7, non-economical barriers such as ethnic roots are related with

preferences for traditional methods of health care. Secondly, low levels of education, having ethnical roots, living in rural sector are associated in Peru with low levels of income capacity. This low income capacity could imply also insurance affordability, contradicting the *normative* definition. This phenomenon occurs due to the existence of a subsidized insurance, SIS, focused on those that cannot get any other kind of insurance, or in other words those who could not afford one from a normative way.

In the next section, we present the quantitative analysis in which we not only discuss the results but also interpret their relation or not with Bundorf and Pauly model.

9. Quantitative Analysis

9.1 National Household Survey 2006 (ENAHO 2007)

The main objective of the ENAHO is to be an instrument for the analysis of living and poverty conditions of the Peruvian Population. The survey covers all of the 24 Departments (Regions) of Peru and the number of visited households is equal to 22 640, which implies 93 350 people. Since ENAHO is a nationwide survey, the use of a weighting factor is essential to obtain expanded results¹². ENAHO enables the analysis of different social and economic topics such as: Household characteristics, education level reached by its members, labor situation, family income and expenditure, health care, among others.

9.2 Descriptive and Econometric Analysis of ENAHO 2007

In the following paragraphs, we make a quantitative analysis of the hypothesis. First, we present different tables¹³. In each table we intersect access to insurance with other variables that can provide relevant information about the profile of those individuals who cannot access health insurance.

Second, we present an econometric probit model to estimate the probability of accessing health insurance, given different independent variables.

¹² With the expansion factor, the whole population of analysis is 29'126,311 people, which is approximately the population of Peru.

¹³ We present a row and a column total in each table, just in the case of continuous variables like income and expenditure we are presenting the mean.

9.2.1 Descriptive Analysis

The first figure arising from the database analysis is the high percentage of individuals without insurance: from the entire Peruvian population, almost 60% are uninsured, (around 17 million Peruvian citizens). This uninsured population is concentrated in the same proportion in both urban and rural sector, around 60%. Regarding the insured population in both sectors; SIS is the kind of insurance with more presence in the rural sector, 34%, while ESSALUD has the highest presence in the urban sector, 27%.

Table N°5

HEALTH INSURANCE AND URBAN/RURAL SITUATION

(%)

	Rural	Urban	Total
Private	3.18	96.82	100.00
	0.24	4.07	2.72
EPS	0.32	99.68	100.00
	0.00	0.61	0.39
Essalud	8.90	91.10	100.00
	4.77	26.66	18.92
SIS	64.64	35.36	100.00
	33.99	10.16	18.58
None	36.30	63.70	100.00
	60.99	58.50	59.38
Total	35.34	64.66	100.00
	100.00	100.00	100.00

The largest proportion of people without insurance is found in the non-poor sector, 57%; while, 66%, of the “not extremely poor” are uninsured. Therefore, we can start concluding that it is not just a matter of economic capacity not to access health insurance. On the contrary, the poorest segments of the population can easily access health insurance because of SIS. On the other hand, the private and social security systems are clearly concentrated in non poor sectors, while the majority of people who is affiliated to SIS are poor, 68%.

Table N°6
HEALTH INSURANCE ACCESS AND POVERTY SITUATION
 (%)

	Extreme Poor	No Extreme Poor	Non Poor	Total
Private	0.25	2.63	97.12	100.00
	0.05	0.28	4.36	2.72
EPS	0.18	1.76	98.06	100.00
	0.01	0.03	0.64	0.39
Essalud	0.83	9.50	89.67	100.00
	1.14	7.01	28.03	18.92
SIS	31.73	36.88	31.39	100.00
	42.70	26.71	9.64	18.58
None	13.05	28.51	58.44	100.00
	56.11	65.98	57.33	59.38
Total	13.81	25.66	60.53	100.00
	100.00	100.00	100.00	100.00

If we compare access to insurance with quintile of expenditure, we find that there is a proportional share of non insured people in every quintile. However, the largest difference lays in private and social security systems, where there is a positive correlation between higher quintiles and being insured under these modalities.

Table N°7
HEALTH INSURANCE AND EXPENDITURE QUINTILES
 (%)

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Private	0.63	1.63	3.57	11.26	82.90	100.00
	0.09	0.24	0.51	1.51	9.23	2.72
EPS	0.18	0.28	2.99	7.52	89.04	100.00
	0.00	0.01	0.06	0.15	1.44	0.39
Essalud	2.64	7.66	14.40	27.18	48.11	100.00
	2.77	8.00	14.26	25.37	37.27	18.92
SIS	32.52	28.56	20.91	12.15	5.86	100.00
	33.48	29.29	20.32	11.13	4.46	18.58
None	19.35	19.06	20.88	21.12	19.58	100.00
	63.65	62.46	64.85	61.85	47.61	59.38
Total	18.05	18.12	19.12	20.28	24.43	100.00
	100.00	100.00	100.00	100.00	100.00	100.00

Average income and expenditure of the uninsured are both far below from the ones of those that have private and social security insurance plans. However, income and expenditure of the uninsured is somehow above the average of those who are insured by SIS.

Table N°8
MEAN EXPENDITURE AND INCOME BY
HEALTH INSURANCE
 (Monthly S/.)

	Expenditure	Expenditure per capita	Income
Private	4700	1086	7639
EPS	4844	1082	9893
Essalud	2526	562	3498
SIS	1008	183	1032
None	1509	312	1781
Total	1733	364	2188

There is no major concentration of insured people in any particular region; the largest proportion is located in the highlands, 35%. Most of SIS affiliates are also concentrated in the highlands, 52%. At the same time, from the entire population of the highlands, SIS was the type of insurance with the most affiliates, 27%. The main reason for this is that there is a large concentration of poor people in that region, around 60%. On the other hand, most of Private and EPS affiliates are located in the city of Lima.

Table N°9
HEALTH INSURANCE AND GEOGRAPHIC SITUATION
 (%)

	Lima	Coast	Highlands	Jungle	Total
Private	71.16	14.43	9.81	4.61	100.00
	6.80	1.74	0.75	0.93	2.72
EPS	86.47	3.70	7.74	2.10	100.00
	1.20	0.06	0.09	0.06	0.39
Essalud	43.90	27.07	22.45	6.58	100.00
	29.23	22.66	11.96	9.26	18.92
SIS	8.64	17.83	52.11	21.43	100.00
	5.65	14.65	27.27	29.60	18.58
None	27.34	23.18	35.85	13.62	100.00
	57.13	60.89	59.93	60.15	59.38
Total	28.42	22.61	35.52	13.45	100.00
	100.00	100.00	100.00	100.00	100.00

Having no insurance, as well as having SIS, is highly associated with low levels of education. The opposite effect occurs with the private and contributive regime, both associated with high levels of education. In the case of SIS, the main difference is between the no educated and those with at least primary school, while in the case of being uninsured just in the case of high education the majority of the uninsured are less than 50%. In fact, the higher concentration of uninsured occurs when the

individuals have primary or secondary education, rather than with no education. This is because SIS is concentrated in the poorest sectors where there is also an important concentration of people with no education.

Table N°10
HEALTH INSURANCE AND LEVEL OF EDUCATION
(%)

	None	Primary	Secondary	Superior	Total
Private	13.60	9.56	45.08	31.76	100.00
	1.02	0.94	5.14	8.38	2.78
EPS	22.98	5.49	22.77	48.76	100.00
	0.24	0.08	0.36	1.80	0.39
Essalud	23.68	23.12	27.20	26.00	100.00
	12.30	15.72	21.44	47.43	19.18
SIS	67.70	27.46	4.27	0.56	100.00
	30.10	15.98	2.88	0.88	16.42
None	33.98	31.00	27.89	7.13	100.00
	56.34	67.28	70.17	41.51	61.23
Total	36.93	28.21	24.34	10.52	100.00
	100.00	100.00	100.00	100.00	100.00

About the relationship between health insurance and informal job, 76% of informal workers have no insurance. Indeed, most SIS affiliates and uninsured people are concentrated in the informal sector. Therefore, these figures reflect the presence of labor barriers to access health insurance.

Table N°11
HEALTH INSURANCE AND INFORMAL JOB
(%)

	No	Yes	Total
Private	82.87	17.13	100.00
	3.69	1.19	2.72
EPS	94.15	5.86	100.00
	0.61	0.60	0.39
Essalud	80.71	19.29	100.00
	25.09	9.33	18.92
SIS	71.75	28.25	100.00
	21.90	13.42	18.58
None	49.94	50.06	100.00
	48.71	76.00	59.38
Total	60.89	39.11	100.00
	100.00	100.00	100.00

Finally, it seems that suffering from a disease during the last month shows no clear relation to being insured. We must take into account that having a disease is not a permanent situation; it is an event that occurs with an indeterminate frequency.

Table N°12
HEALTH INSURANCE VS DISEASE 1/
(%)

	No	Yes	Total
Private	78.51	21.49	100.00
	2.87	2.28	2.72
EPS	80.02	19.98	100.00
	0.42	0.31	0.39
Essalud	74.76	25.24	100.00
	19.03	18.61	18.92
SIS	69.89	30.11	100.00
	17.47	21.80	18.58
None	75.37	24.63	100.00
	60.20	57.00	59.38
Total	74.34	25.66	100.00
	100.00	100.00	100.00

1/ Disease suffered during the last month

9.2.2 Test of differences

In the previous section, we have observed important differences between the uninsured group and each insured group (private, contributive or subsidized system) regarding different characteristics. But those differences were merely descriptive; therefore we will test if the differences are significant.

In the following tables we present the results of the application of the t-test for means and the chi-squared test of independence. The null hypothesis of the test is that the mean of a variable is the same for two different groups. We test if the proportion of uninsured¹⁴ is the same along all the variables with two categories. Then, we test the differences of continuous variables, such as expenditure or income, between uninsured and insured. In the case of the chi-squared test, we seek to test that a categorical variable is equally distributed between two different groups (insured and uninsured).

¹⁴ Since the variable uninsured is discrete, “1” if uninsured, “0” insured, the mean of the variable could be considered as the proportion.

First, we present the tables corresponding to the t-test. Significance can be appreciated through confidence intervals. These do not present any intersection with each other; meaning that the estimated means are not the same.

Table N°13

	Mean	Std Deviation	Confidence Interval	
Rural	0.61	0.01	0.59580	0.62059
Urban	0.57	0.01	0.55829	0.57910
Poor	0.62	0.01	0.61246	0.63383
Non-Poor	0.56	0.01	0.54628	0.56684
No disease	0.59	0.00	0.58152	0.59887
Disease	0.56	0.01	0.55102	0.57250
Male Household Head	0.57	0.00	0.56344	0.58098
Female Household Head	0.63	0.01	0.61397	0.64143
Formal Job	0.47	0.00	0.46511	0.48383
Informal Job	0.75	0.00	0.74454	0.76244

Table N°14

		Mean	Std Deviation	Confidence Interval	
Monthly Expenditure by household	Insured	2044.36	43.09	1959.86	2128.86
	Uninsured	1509.04	16.97	1475.77	1542.32
Monthly Income by household	Insured	2754.07	78.99	2599.19	2908.95
	Uninsured	1781.48	27.44	1727.68	1831.28
Monthly Expenditure per capita	Insured	437.67	9.36	419.31	456.03
	Uninsured	311.67	2.93	305.91	317.43

In the case of the chi-squared test, we reject the null hypothesis of equal distribution of each row category between insured and uninsured.

Table N°15

	Insurance	No Insurance	Total
None	15488	18671	34159
	45.34	54.66	100
Primary	8635	16860	25495
	33.87	66.13	100
Secondary	5854	13979	19833
	29.52	70.48	100
Superior	4875	3494	8769
	58.25	41.75	100
Total	34852	53004	87856
	39.67	60.33	100

Pearson Chi2(3)=0.0029

Pr=0.000

Table N°16

	Insurance	No Insurance	Total
Lima City	5246	6526	11808
	44.43	55.57	100
Coast	9609	13746	23355
	41.14	58.86	100
Highlands	15684	21516	37205
	42.17	57.83	100
Jungle	8462	12520	20982
	40.33	59.67	100
Total	39006	54344	93350
	41.78	58.22	100

Pearson Chi2(3)=58.3726

Pr=0.000

9.3 Econometric Analysis

In this section, we first introduce the model, taking into account the theoretical framework presented in section 8. After that, we test the proposed hypothesis through a Probit Model for the estimation of the probability of being uninsured.

To pursue this analysis, we have to estimate 5 models using two criteria: The first model considers the entire sample, while the other four models were estimated dividing the sample into two sub-samples: poor, non-poor¹⁵ and urban, rural. This division was made because there are variables that interact differently in rural and poor sectors, since in these sectors the majority of insured people are SIS affiliates,

¹⁵ The definition of poor is that from the INEI.

while in the urban-non poor sector, the highest concentration of insured people corresponds to the private and contributive regimes.

9.3.1 Specification of the model

As it was introduced in section 7, there are three different kinds of barriers that impede access to health insurance. In order to test these hypotheses, we define a probit model, considering the behavioral definition of affordability as presented in section 8.

As mentioned before, we need to estimate the probability of not being insured given specific characteristics for each individual. We relate the barriers to the type of explanatory variables presented by Bundorf and Pauly in their *behavioral* definition of affordability. These three main types of barriers are divided into: (i) economic, (ii) labor and (iii) non-economic characteristics. These three groups fit with the establishment of proxys for income, price and preferences established by the authors.

The dependent variable

First of all, we define the dependent variable. Since, we are using a Probit model, the variable can take two different values, “1”, if the individual does not have any kind of insurance, and “0” if (s)he has any other kind of insurance (SIS, ESSALUD, EPS or Private). Thus, our dependent variable will be composed by values equal to “1” in 58% of the cases, while the “0” values constitute 42% of the sample.

The independent variables

Independent variables have been divided in three groups.

Economic variables:

- Monthly Expenditure per capita: This continuous variable was constructed using the *Annual expenditure of the household*, which was the expenditure variable included in ENAHO, and is expressed in Soles.

Labor variables:

- Informal Job: this is a dichotomic variable that takes the value “1” if the individual works in a firm with less than five employees or if he works independently but without a high educational degree; and “0” otherwise.

Non-economic variables:

- Education: We introduce the effect of education using three dichotomic variables: (i) Primary School, (ii) Secondary School, and (iii) Higher education. In each case, the variable takes the value “1” if the individual is categorized in the highest educational level and “0” otherwise.
- Size of the household: Continuous variable.
- Age: Continuous variable
- Disease in last month: It takes the value “1” if the individual has suffered from any kind of disease during the last month, and “0” otherwise.
- Geographic location: We define four categories for geographic location: Lima City, Coast, Highlands and Jungle. Because of multicollinearity problems, we exclude “Jungle”. Besides, it had the less concentration of population and did not have any significant effect in estimations not presented here. In each case, the variable takes the value “1” if the individual lives in the corresponding region and “0” otherwise.
- Female Household Head: It takes the value “1” if the head of the individual’s household is female, “0” otherwise.
- Indian roots: If the individual reports that the native tongue of his or her parents was a native language, we consider him or her as having Indian roots and the variable takes the value “1”, “0” otherwise.

9.3.2 Results

We present the econometric results of our model at individual level. We estimate the model five times considering five different criteria: 1. A national estimation, including the entire Peruvian population; 2. including only all the population living under poverty conditions; 3. including only the population formed by the non-poor; 4. including only the urban population; and, finally, 5. including only the rural sector.

The division of poor/non poor and urban/rural was made in order to analyze the presence of different effects generated by the explanatory variables, since the characteristics of the Peruvian population in each group differ.

Table N°17
NATIONAL SCALE

	Coefficient	t	P>t
Household Monthly Expenditure per capita (logs)	-0.326	-20.56	0.00
Primary School	0.321	21.76	0.00
Secondary School	0.486	27.98	0.00
High Education	-0.131	-5.45	0.00
# of Household members	-0.016	-3.69	0.00
Informal Job	0.594	40.1	0.00
Age	0.007	17.18	0.00
Disease in last month	-0.038	-2.68	0.01
Lima City	0.118	3.47	0.00
Coast	0.131	4.19	0.00
Highlands	-0.097	-3.18	0.00
Female Household Head	0.168	8.12	0.00
with indian roots	0.038	1.82	0.07
Constant	1.285	12.38	0.00
Number of observations	93269		
Population size	29126311		

At the National scale all the coefficients are statistically significant. In that sense, we can draw the following conclusions:

- Expenditure capacity is a determinant in reducing the probability of being uninsured.
- Having just primary or secondary education increases the probability of being uninsured, while higher education has the opposite effect. The significance of the educational coefficient is interpreted as follows: education has a direct effect since people with higher education can better understand the benefits of being insured. However, it must be taken in account that having no education reduced the probability of having no insurance in comparison with having just primary or secondary school. As was explained before, this is due to the high concentration of SIS in groups with no education.

- The fact that a larger number of household members decrease the probability of being uninsured can be interpreted as follows: a larger number of persons in a household can work and therefore get an insurance plan that also covers the rest of members in the household.
- Having an informal job increases the probability of not accessing any kind insurance.
- The effect of age in the probability of being uninsured is influenced by the important number of children that have access to SIS.
- Although descriptive statistics do not reveal any important relationship between having a disease and accessing insurance, the econometric model does. Thus, as we explained above, this could be an effect of the fewer occurrences of diseases.
- Regarding the Geographic location, living in the Highlands decreases the probability of being uninsured, while in the Coast this probability increases. One interpretation could be the expanded presence of SIS in the Highlands.
- Having a female household head increases the probability of not having health insurance, because women, in the Peruvian case, still do not have much economic power and capacity to get a formal job. Normally, they access insurance as relatives, since the husband is the one who accesses insurance directly.
- Finally, having Indian roots increases the probability of not accessing health insurance. This result reflects the existence of cultural barriers, still present among Indian people, limiting their access to healthcare services.

Table N°18
POVERTY

	Coefficient	t	P>t
Household Monthly Expenditure per capita (logs)	0.086	2.18	0.03
Primary School	0.374	17.50	0.00
Secondary School	0.697	18.61	0.00
High Education	0.067	0.86	0.39
# of Household members	-0.001	-0.22	0.83
Informal Job	0.400	15.45	0.00
Age	0.024	27.45	0.00
Disease in last month	-0.081	-3.56	0.00
Lima City	0.239	3.58	0.00
Coast	0.119	2.19	0.03
Highlands	-0.007	-0.16	0.87
Female Household Head with indian roots	0.074	2.05	0.04
	-0.065	-1.76	0.08
Constant	-1.076	-5.05	0.00
Number of observations	39243		
Population size	12254917		

The results obtained for the population living under poverty conditions are:

- For people living under poverty conditions, we find that expenditure has a positive effect on the probability of being uninsured. This happens because the subsidized regime is specially focused on poor populations. This way, with a higher expenditure capacity, individuals reduce their probability of being considered for SIS, and since their expenditure capacity is still very low, they cannot access another type of insurance. Linking this finding to the concept of affordability, we state that in the case of the poor, they can afford health insurance if they do not have the expenditure capacity to obtain health insurance. This goes in the opposite way to what Bundorf and Pauly state.
- Having Indian roots has a negative effect, significant at 90%, because of the high concentration of SIS on that group. This group displays high percentages of poverty.

- The effect of having higher education is not significant. This means that the effect of higher education should be not different from that of no education when an individual is poor.

Table N°19
NO POVERTY

	Coeficcient	t	P>t
Household Monthly Expenditure per capita (logs)	-0.627	-24.72	0.00
Primary School	0.212	10.44	0.00
Secondary School	0.392	19.21	0.00
High Education	-0.078	-2.97	0.00
# of Household members	-0.029	-4.71	0.00
Informal Job	0.679	38.07	0.00
Age	-0.001	-1.19	0.23
Disease in last month	-0.039	-2.23	0.03
Lima City	0.126	3.34	0.00
Coast	0.086	2.48	0.01
Highlands	-0.029	-0.82	0.41
Female Household Head	0.229	9.04	0.00
with indian roots	0.057	2.38	0.02
Constant	3.372	20.02	0.00
Number of observations	54026		
Population size	16871394		

Regarding the results corresponding to the population living in non poverty, we find that:

- The main difference between this scenario and our analysis of people living under poverty conditions is that in this case, the effect of Indian roots is direct, thus cultural barriers have more weight since we are analyzing the group of non-poor individuals.
- Higher education has a significant effect in determining the probability of being insured. Therefore, we can infer that once the problems related to poverty have been solved, the effect of higher education appears. Otherwise, the only significant effect would be that from having only school education.

Table N°20**URBAN**

	Coefficient	t	P>t
Household Monthly Expenditure per capita (logs)	-0.519	-25.00	0.00
Primary School	0.295	14.56	0.00
Secondary School	0.445	21.79	0.00
High Education	-0.037	-1.40	0.16
# of Household members	-0.017	-3.03	0.00
Informal Job	0.658	36.67	0.00
Age	-0.001	-1.79	0.07
Disease in last month	-0.031	-1.69	0.09
Coast	-0.026	-0.96	0.34
Highlands	-0.156	-5.37	0.00
Female Household Head	0.191	7.53	0.00
with indian roots	0.095	3.82	0.00
Constant	2.760	19.23	0.00
Number of observations	56416		
Population size	17617750		

Taking into account the results for the urban sector, we find that:

- The cultural factor in urban areas is still present through the effect of having Indian roots, which could be interpreted as preferring non professional health care, and therefore no health insurance.

Table N°21
RURAL

	Coeficcient	t	P>t
Household Monthly Expenditure per capita (logs)	-0.15	-5.1	0.00
Primary School	0.40	17.79	0.00
Secondary School	0.90	23.13	0.00
High Education	0.05	0.77	0.44
# of Household members	0.00	0.1	0.92
Informal Job	0.40	16.24	0.00
Age	0.03	29.77	0.00
Disease in last month	-0.09	-4.07	0.00
Coast	0.00	0.03	0.98
Highlands	-0.07	-1.43	0.15
Female Household Head	0.09	2.44	0.02
with indian roots	-0.13	-3.21	0.00
Constant	0.00	-0.02	0.98
Number of observations	36853		
Population size	11508561		

- Finally, at a rural level, the geographic distinctions play no significant role in determining the probability of being insured.
- Having Indian roots in the rural sector decreased the probability of being uninsured because of the significant coverage of SIS in the rural sector.

The estimations of these five models allow us to set forth some important general conclusions:

- The economic factor has two significant effects. The direct effect that means that with higher expenditure capacity the probability of being insured increases, and a contrary effect that reflects that the lower the expenditure capacity, the higher the probability of having insurance because of SIS.
- The type of employment (informality) determines, to a great extent, the probability of being insured in all the cases.

- From the non-economic factors, we can highlight the influence of having only school education (primary or secondary school). This prevents the individual from becoming aware of the benefits of being insured. On the other hand, a higher educational level shows that the individual has the capacity of taking into account the benefits of being insured, however this last effect, as we will show below, is not always significant. Other important determinant for being uninsured is belonging to a household with a female head. As we explained before, women in Peru are still in a situation of inequality regarding the access to a job and economic resources, and many of those who are insured accessed this service because they are related to an insured party, such as the husband. Therefore, a female household head has fewer chances of getting insurance, as well as her direct relatives.

Taking in consideration the definitions of affordability, we can link these results with what Bundorf and Pauly state in the following way. The individuals can afford health insurance from the *behavioral* definition since insurance can be afforded through high expenditure capacity or through a job which provides health insurance for free. Thus, we state that demand for insurance depends positively on the proxy of income (household expenditure per capita) and on the proxy of price (kind of job). At the same time there are other factors that can have some relation with income and price of insurance such as education, ethnical roots, gender of household head, age. Most of these variables can also reflect preferences for other goods instead of health insurance, because of the lack of knowledge of the benefits of being insured. These factors also affect the demand for health insurance and then the probability of being insured.

On the other hand, we take in account the results not considered in the theoretical framework, concretely the fact that health insurance can be affordable not only because of high income, but also because of low income, i.e. the SIS effect. This result is obtained in the rural and poor sectors. However, this framework of low income affordability should be accompanied also by a preference for health insurance. This means that low-income individuals are insured by SIS because they cannot afford any other kind of insurance and because they recognize the benefits of being insured too. In consequence, the behavioral component will play an important role in the Peruvian case, not as a possibility to choose but as reflecting knowledge.

10. Concluding remarks and Policy implications

In conclusion, although the Peruvian government has undertaken certain policies aiming at expanding insurance coverage (larger number of insured people); although the creation of EPS has helped ESSALUD in improving its performance, and although the creation of SIS has been a useful alternative for bringing insurance closer to people of scarce resources; there are still many different factors that interact and become “barriers” that prevent an important group of the Peruvian population from becoming insured.

The main characteristics of this uninsured group are: First, we can establish that uninsured individuals could have informal jobs. This informality is characterized by the fact that employers cannot provide their employees with social security benefits, including health insurance (ESSALUD or EPS). Second, not having enough economic resources is certainly one characteristic of the uninsured, however, those with very low expenditure capacity have a higher probability of being insured, because of SIS, which focuses on groups without enough resources to access any other type of insurance. Third, being uninsured is correlated with having only primary or secondary education, which implies that these individuals do not have the ability to acknowledge the benefits of having insurance; while the probability of being uninsured reduces for those who do not have education in comparison with having primary or secondary school. Fourth, the decision of being uninsured could be influenced by the decision of not seeking for professional healthcare attention, which is manifested through the Indian roots of an individual. Fifth, gender inequities in accessing a formal job or education result in female household heads having a lower capacity of getting insurance and, therefore, providing insurance to the rest of their relatives.

From the above conclusions, some policy recommendations are in order:

- The introduction of SIS has been a good insurance alternative for people of low socio-economic status. Therefore, the Government should keep trying to reach all those who cannot access any kind of insurance, for example by increasing the number of physicians, expanding the number of MINSA health facilities in remote communities and through educational campaigns using

the media or sending trained personnel to remote locations to educate the population on the benefits of being insured, in this case through SIS.

- The government should take a more active role in promoting labor policies that promote and provide incentives for the formalization of firms, and this way get employees to be a part of contributive regimes (ESSALUD or EPS), specially those who work under a non-personal hiring contract (without social benefits).
- Take into consideration the existence of cultural barriers in many sectors of the population, especially in rural and poor sectors. This does not mean to educate people by force, but instead, it means to understand their beliefs, answer their questions and try to explain them the advantages of being insured.
- As a further step, the Peruvian Government should aim at the enlargement of SIS coverage, with the objective that all the population living in poverty and the workers out of the contributive regime, receive health insurance paid by the government.

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