

DOES MEXICO'S *SEGURO POPULAR* AFFORD EQUAL HEALTHCARE ACCESS TO  
INDIGENOUS PEOPLES?

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By

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## ABSTRACT

*Seguro Popular* was part of a major reform to Mexico's healthcare system enacted in 2003. Essentially, it was designed so that Mexico could attain universal health coverage. The 2003 reform that created *Seguro Popular* mandated that it be targeted to indigenous and rural populations without access to the traditional social security institutions. Given the vulnerability and marginalization of indigenous peoples in Mexico, ensuring that they have equal access to healthcare is important.

In 2010, a survey was carried out by the Ministry of Health, charged with oversight of *Seguro Popular*, to discern the profile and practices of the program's affiliates. Analysis using this data, reveals that even after common access barriers and contributing factors to healthcare decisions (such as income and education levels) are taken into account, indigenous affiliates are still less likely to use their *Seguro Popular* policy than non-indigenous affiliates.

The study's finding warrants both more research on understanding indigenous peoples' choices with regard to healthcare utilization and to finding policies and program features that allow for greater access to service provision on behalf of *Seguro Popular's* indigenous affiliates.

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## TABLE OF CONTENTS

Introduction.....	1
Background to <i>Seguro Popular</i> and Indigenous Peoples .....	3
Literature Review.....	7
Conceptual Model.....	10
Data Description .....	13
Descriptive Statistics.....	16
Data Analysis Plan.....	21
Results.....	25
Policy Implications and Conclusions.....	32
Appendix A.....	36
Appendix B.....	37
Appendix C.....	38
Bibliography .....	40

## INTRODUCTION

The UN's Universal Declaration of Human Rights affirms the right of all human beings to health, in its 25<sup>th</sup> Article. The challenge of defining this right, however, remains difficult, particularly from a policy perspective when, arguably, the provision of healthcare -not the population's actual state of health- is the only element that policy-making can control. (Sen, 2008) It is easier to understand the concept of a right to health on a continuum. At a minimum, it means a right to conditions that protect health in the population. (Kinney, 2001) However, while many countries uphold this right by name, the gap in actual healthcare coverage can still be sizeable, particularly among the most vulnerable population groups. Health systems are social constructs that reflect the social inequities and exclusions that exist in the society in which they are embedded. Health systems can therefore both reinforce existing inequities and intensify exclusion, or they can provide a platform and framework for overcoming inequities and fostering inclusion. (Mackintosh and Tibandebage, 2004)

Mexico guarantees her citizens the right to the protection of health in the 4<sup>th</sup> Article of the Constitution and the 2<sup>nd</sup> Article of Mexico's Constitution declares her a plurinational state in recognition of the 62 ethnolinguistic groups living within her borders. Nevertheless, this formal recognition has not necessarily been translated into public policy, with studies suggesting that there is a sizeable gap in poverty incidence between indigenous and non-indigenous peoples. (Garcia-Moreno and Patrinos, 2011) Multidimensional poverty measurements used by Mexico's National Council for the Evaluation of Social Development Policy (CONEVAL) incorporate six social rights (education, health, social security, housing, basic services and food). In 2008, 93.9% of Mexico's indigenous population was denied at least one of these rights and 70.9% of

indigenous peoples in Mexico live in poverty. (PNUD-CDI, 2010, p. 16) A collaborative study between Mexico's National Commission for the Development of Indigenous Peoples (CDI by its Spanish Acronym) and the United Nations Development Programme (UNDP) indicated that in all but one state<sup>a</sup>, the Human Development Index (HDI) for indigenous peoples is lower than the HDI for non-indigenous people living in the same state. (CDI-PNUD, 2006, p.79) For every 100 live births by non-indigenous women aged 12 years or older, the national average of deceased children is ten. For every 100 live births by women who speak an indigenous language, this average rises to 16 deceased children. (INEGI, 2004, p.35) The importance of ensuring equal access to healthcare for indigenous peoples in Mexico is clear.

Mexico has essentially seen three generations of health reform. The first, in 1943, created the foundation of the health system still in place today: the provision of healthcare by way of social security for all formal sector workers through either the Mexican Institute of Social Security (IMSS by its Spanish acronym) or the Institute for Social Security and Services for State Workers (ISSSTE in Spanish) and the provision of healthcare by way of a public assistance sector led by the National Ministry of Health (SSA in Spanish) for all those not covered by one of the social security agencies. During the 1980s, a second generation of reforms decentralized the health services and structure of all institutions covering the uninsured population and put them under the management of the state governments. This was intended to achieve a National Health System and progress towards universal coverage. (Nigenda *et al*, 1999) In 2003, Mexico's Congress approved the third generation of reform: the creation of the National System of Social Protection of Health and its operational arm "Seguro Popular." With this third

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<sup>a</sup> The exception was Aguascalientes, which has the country's smallest indigenous population and where indigenous peoples only account for 0.4% of the state population.

generation of reforms, the Mexican government claims that it has reached universal health coverage. (SPSS, 2011, p.4) The government also reports that the inclusion of indigenous communities continues to be a priority for the National System of Social Protection of Health (SPSS by its Spanish acronym).

Is the importance of including indigenous communities in the SPSS any different to ensuring equal access for rural population groups as opposed to urban? Would the strategy for increasing access to healthcare for indigenous peoples look dissimilar to a policy designed to lessen the gap in healthcare coverage between all population groups that live below the official poverty line as opposed to those who do not? In other words, are there characteristics specific either to indigenous peoples or to the healthcare service provider that mean indigenous peoples have higher access barriers to healthcare than nonindigenous people? By examining the likelihood that an indigenous *Seguro Popular* affiliate will use their insurance policy to access healthcare versus a non-indigenous affiliate, this paper attempts to answer these questions.

### **BACKGROUND TO SEGURO POPULAR AND INDIGENOUS PEOPLES**

The 2003 reforms that created *Seguro Popular* mandated that public funding for health was to be increased by one percent of the 2003 gross domestic product over seven years in order to guarantee universal health insurance. Legislation also mandated the creation of a specific health benefits package and a fund to protect families from catastrophic health expenditures. (Gakidou *et al*, 2007) The voluntary and subsidized health insurance scheme was to be targeted to the country's poor and marginalized families with no access to social security programs. (Frenk *et al*, 2009) Families were allocated a bracket dependent on their income and if found to be within

the lowest four income brackets, they were exempt from any annual fees or quotas for the insurance policy. In order to access care through their *Seguro Popular* policy, a patient has to use a SPSS accredited health facility.

The SPSS' report on results from 2011 outlines the changes and additions to the initial 2003 reforms. The health benefits package (known as CAUSES in Spanish) covers the diagnosis, laboratory studies and treatment for 275 medical conditions. The protection fund against catastrophic health expenditures covers 57 interventions for 16 additional medical conditions, including eight categories of cancer and HIV. In 2006, the SPSS launched Medical Insurance for a New Generation (SMNG by its Spanish acronym) adding an additional 128 medical conditions prevalent in children to its coverage. The Social Protection Health System also took charge of the health component for Mexico's cash-conditional transfer program *Oportunidades* and initiated a program called Healthy Pregnancy or *Embarazo Saludable* in Spanish, which afforded pregnant women with no social security priority in affiliation to *Seguro Popular*. (SPSS, 2011, p. 3) The latter represented an addition to, and some may argue a shift in, *Seguro Popular's* priorities, from targeting rural and indigenous population groups only to including all pregnant women and newborn children nationwide.

This coverage arguably allowed easier justification for the program's tendency to focus affiliation and infrastructure improvement efforts on urban areas, despite its mandate to the contrary. (World Bank, 2008, p. 55) SMNG's coverage, for example, has a 72% urban 28% rural split. (CONEVAL 2010) Success in affiliating indigenous groups has not been as prominent as that for non-indigenous people.

In 2010, the number of *Seguro Popular* affiliates living in indigenous municipalities<sup>b</sup>, municipalities with indigenous presence<sup>c</sup> and municipalities with a disperse indigenous population<sup>d</sup> totaled 3,453,767. This is the equivalent to 9.4% of *Seguro Popular*'s total affiliation. However it also means that only 28.8% of the country's indigenous peoples are covered by *Seguro Popular*. (UAC-CNPSS 2010, p.16)

In 2003, 50 million people were estimated to have no access to traditional social security in Mexico and therefore eligible to receive *Seguro Popular*. Five million, or 10%, spoke an indigenous language. Using this information, it is understandable why the SPSS claims it has reached the target of universal health coverage with 51.8 million affiliates recorded in 2011. Nevertheless, there are several indications that *Seguro Popular* does not equate to universal health coverage in Mexico. For example, SPSS has had to introduce the term *voluntary* universal health coverage into its literature as the insurance scheme is not mandatory for all of Mexico's uninsured population. Furthermore, demographic changes and economic crises have undoubtedly affected the number of Mexican citizens with access to traditional social security with indigenous population groups being particularly vulnerable. If only 28.8% of the indigenous population is covered by *Seguro Popular*, then the remaining 71.2% would need to have access to social security or private health insurance to ensure universal health coverage. This is not the case.<sup>e</sup>The SPSS is therefore correct in determining that indigenous communities should remain a high priority for the program.

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<sup>b</sup> Defined as those municipalities where over 40% of the total population is comprised of indigenous peoples.

<sup>c</sup> Defined as those municipalities where indigenous peoples represent less than 40% of the total population but contain more than 5,000 people who speak an indigenous language.

<sup>d</sup> Defined as those municipalities where an indigenous population is registered but does not represent a significant proportion of the total population.

<sup>e</sup> Instead, the CDI-PNUD estimates that 72.5% of indigenous peoples lack access to healthcare entitlement.

According to Mexico's 2010 Census, 6,913,362 people over the age of three speak an indigenous language. In addition, there are 678,954 newborns or children under the age of 2 who live in a household where the parent or guardian speaks an indigenous language. Using language as the only measurement construct, Mexico therefore has 7,592,316 indigenous peoples or 6.8% of the total population. Language as a measurement construct can prove problematic for several reasons, including the fact that in this case Mexico appears to have left out all indigenous children between the age of two and three from the census count. Using self-identification, 15.7 million people in Mexico consider themselves indigenous according to the 2010 Census. This is 14% of the country's total population. (INEGI 2010) The Council for the Rights of Indigenous Peoples along with the UNDP Mexico uses language as a measurement but also includes people who live in households headed by a man or woman speaking an indigenous language. By this calculation, Mexico's indigenous peoples account for 9.8% of the population. (CDI-UNDP 2005) This is the measurement used by the present paper.

Until 2008, Mexico's national household survey did not collect information on identity or language, hindering the precision with which public policy analysis regarding indigenous peoples could be conducted. Since the inclusion of such measures on the National Income and Expenditure Household Survey (ENIGH by its Spanish acronym), studies have suggested that three-quarters of the poverty gap between indigenous and nonindigenous peoples can be attributed to explained or observable factors, including education and access to services. The remaining unexplained component (a quarter of the poverty gap in this case) is often taken as an upper bound estimate of the level of discrimination. (Garcia-Moreno and Patrinos, 2011) If this analysis is correct and both discrimination against indigenous peoples and poverty rates are

decreasing in Mexico, then an important opportunity to further explore the observable factors that explain the poverty gap between indigenous and nonindigenous peoples arises. If analysis is indeed able to isolate the level of access to education and health services, for example, as a causal or contributing factor to the poverty gap between indigenous and non-indigenous peoples, then a policy map to correct for this becomes clearer to draw.

### **LITERATURE REVIEW**

The equal opportunity principle infers that predetermined individual circumstances or characteristics, such as that of being an indigenous peoples, should not affect individual opportunities in life. (Roemer, 1998) Marcelo M. Guigale notes that as the percentage of Latin American people living in poverty declines, the political and policy debates have shifted from poverty toward inequality. In a region of countries with some of the highest Gini coefficients in the world, the inequality debate is loud and calls into question the role of the state as a redistributor of wealth and a guarantor of equal opportunity by means of equal access to public services. (Barros *et al*, 2009, p. xvii) Hall and Patrinos find that an indigenous person in Latin America is more likely to live in poverty, reach a lower education attainment and have less access to basic health services. Data from Mexico's 2006 Nutritional and Health survey revealed that 63% of indigenous peoples who managed to reach or use a health center would not return because the center was either closed, lacked medicines and equipment, had very long waiting times or was a very long distance away.

Discerning the role of the state in ensuring these types of problems do not occur and in providing healthcare and access to insurance for vulnerable population groups is not an easy

task. Generally, T.R. Reid has identified four basic types of health care systems with differing levels of government involvement from completely financing and providing health care to minimum involvement in an out-of-pocket model. Somewhere in between is Social Protection of Health (SPH) and the question of whether this affords better access to healthcare for vulnerable groups than the others. Joris J. Michielsen *et al* contend that SPH, a European public construct geared to a model of industrial labor, is of recent origin in most developing countries. Although SPH is aimed at universal entitlement based on citizenship, the United Nations Department of Economic and Social Affairs argues that SPH has typically not covered more than a few fortunate groups because of financial and labor market-related constraints. For example, replicating a system such as the United Kingdom's National Health System (NHS) where the state provides and funds healthcare for all its citizens and population irreverent of labor status would almost certainly be financially untenable for a developing country. Indeed, according to Bosch *et al*, Mexico took a "very different route to that followed by other countries where a state-provided or state-funded health system covers the whole population ... instead, *Seguro Popular* is arguably an alternative and competing healthcare system to that originally established by Social Security." (Bosch *et al*, forthcoming, p. 3) Bosch's work, however, does believe that *Seguro Popular* will achieve universalization of healthcare.

Other evaluations of *Seguro Popular* have traditionally been heavily focused on measuring the effect of the program on reducing catastrophic health expenditures as well as out-of-pocket health expenditures. Evaluations of health-outcomes or effects across different population groups are less common. For example, Galarraga *et al* find a statistically significant effect of *Seguro Popular* on the reduction of household expenditure on medicines and outpatient care but

they do not measure these effects over any specific populations other than insured and non-insured. (Galarraga *et al*, 2008) Gary King's ten month randomized evaluation of *Seguro Popular* did try to measure whether the program was reaching Mexico's poor and its "intention-to-treat" estimates indicated a reduction from baseline in catastrophic expenditures for poor households. However, the definition of poor was based on rural versus urban definitions and no results particular to indigenous peoples were reported. This evaluation also noted that it did not find any other effects associated with health outcomes or utilization of health services, and that follow-up studies would be needed in order to ascertain the long-term effects of the program. (King *et al*, 2009)

Van Gameren has analyzed the effect of coverage by health insurance on the use of alternative medicines such as folk healers and homeopaths in Mexico, and found that households with insurance coverage less often use alternative medicine, and that the effect is much stronger among the poor than among rich households. (Van Gameren, 2010). Given the strong correlation that theoretically exists between indigenous peoples and alternative medicine, it would be reasonable to assume that Van Gameren's findings would hold true for indigenous peoples specifically and their use of healthcare services provided by *Seguro Popular*. However, from this study it is not possible to ascertain whether the introduction of *Seguro Popular* means indigenous peoples use traditional medicine less and there is a resultant uptake in the utilization of the insurance policy, or whether indigenous peoples have chosen to forgo *Seguro Popular* in favor of alternative healthcare models.

In early 2010, the SNPSS commissioned the Autonomous University of Chapingo with the evaluation of access and effective use of health services by indigenous peoples affiliated to

*Seguro Popular*. The study had several interesting and important findings, including the conclusion that access to and effective use of *Seguro Popular* by indigenous populations is influenced by the presence of inter-related factors comprising physical-geographical, economic, sociocultural and functional or administrative characteristics. The degree to which these characteristics limit access or become obstacles for effective use varies, but the study found that in the case of indigenous peoples it is functional and administrative characteristics –service provision factors – that have the most explanatory power in determining the level of access to and use of health services through *Seguro Popular*. This study performed its analysis on indigenous peoples only and compared affiliates (sample size of 2,488 homes) with a small sample of non-affiliates (230 homes). Despite referring to a treatment and control group analysis, there is no evidence that an econometric technique was employed to ensure that the non-affiliates were a true counterfactual. This body of work leaves open the question of whether indigenous affiliates have the same level of access to, and use of, health services through *Seguro Popular* as non-indigenous affiliates.

### CONCEPTUAL MODEL

“Indigenous peoples remain on the margins of society: they are poorer, less educated, die at a younger age, are more likely to commit suicide, and are generally in worse health than the rest of the population.” *The Indigenous World 2006, International Working Group on Indigenous Affairs*

This study wishes to discern whether an “indigenous effect” can be detected in utilization rates of *Seguro Popular*. That is to say, once common determinants of health service utilization rates -

such as education levels, income, family size, household structure, residence location, access to safe water and medical history (UAC-SNPSS 2010) – have been accounted for, there may still be a difference in the use of *Seguro Popular* by indigenous and non-indigenous affiliates that could reflect either supply-side constraints, demand-side factors or discrimination. Furthermore, all of these characteristics may interact with indigenous affiliates in a systematically different way than with non-indigenous affiliates. For example, indigenous peoples may, on average, have larger families than non-indigenous or be less susceptible to certain chronic diseases than non-indigenous families with different diets. The model used by this paper seeks to incorporate these potential conceptual differences between the two groups' access determinants to first of all test the hypothesis that indigenous affiliates are less likely to use *Seguro Popular* and secondly to determine if there is any statistically significant explanation for why this is, or is not, the case.

Determining which access determinants to measure is not easy given the wide array of factors that could arguably influence a person's decision to seek healthcare. A model that attempts to measure utilization of a health insurance policy must also consider the limitations a user may face. These include: a shortage of providers; long distances to health care facilities; financial problems; healthcare provider and organization-related difficulties (lack of physicians, hospitals and pharmacies in the insurance affiliated network); and personal problems (issues related to language, culture and knowledge).

With regard to *Seguro Popular* and indigenous affiliates, specifically, theory suggests that an additional limit of access to services concerns communication, both about the right, why and how to use *Seguro Popular* but also between medical or administration staff and an indigenous

affiliate. *Seguro Popular* relies heavily on radio and television spots to advertise its services and the informational materials as well as the policy document itself are in Spanish. Part of the indigenous population cannot read or write or are monolingual. A lack of knowledge regarding their rights and obligations as *Seguro Popular* affiliates is likely to have repercussions for the use of *Seguro Popular* health services and there is a possibility that indigenous peoples will face additional barriers when dealing with health facility administration or medical staff, increasing the time they must wait to receive care and possibly diminishing the likelihood of them using *Seguro Popular*.

Building on the analysis of the Autonomous University of Chapingo and the SPSS, the current paper focuses on measuring access to and use of *Seguro Popular* as actual utilization of the insurance policy rather than the latter's effect on household expenditure and out-of-pocket spending on health. In the case of indigenous peoples, such an analysis may not be the most appropriate method of measuring indigenous peoples access to or use of health services given the hypothesis that, unlike their non-indigenous counterparts, they previously relied not on the public health system operated by means-tested user fees or on private providers but rather on less expensive traditional and home based therapies.

This paper diverges from the previous in that it attempts to measure access and utilization variances between indigenous and non-indigenous affiliates rather than between indigenous affiliates and non-affiliates. This distinction theoretically allows the policy-maker to assess whether there are improvements that could be made to the program's design and operations to afford greater access to health services specifically for indigenous peoples. By building an analysis model that looks not only at the relationship between indigenous and non-indigenous

utilization rates, but also at a variety of other influential characteristics that could determine an affiliate's decision to use *Seguro Popular*, this paper also aims to qualify how much of any gap detected in *Seguro Popular* utilization rates between indigenous affiliates and non-indigenous affiliates is unexplained (an upper bound for discrimination) and how much is explained by policy-amenable variables such as the time it takes an affiliate to reach their nearest service provider.

### **DATA DESCRIPTION**

The dataset used for this analysis contains the results from a survey of *Seguro Popular* affiliates in 2010. It was obtained through Mexico's Access to Public and Governmental Information System on the 28<sup>th</sup> September, 2011.<sup>f</sup> The sample design is random and multi-staged with a 97.5% confidence level for the national aggregate. The sample was obtained from the 36.8 million affiliates on the official program list for *Seguro Popular* in September 2010, representative of both the national and state level. 9,901 affiliates made up the original sample and were distributed across 70% of the municipalities in Mexico.

There are 7,207 observations in the actual dataset which represents a non-response rate of 30% from the original sample. The reasons for non-response and their distribution are listed in Table 1.

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<sup>f</sup> Information Request Number 0001200274811

**TABLE 1 – REASONS FOR SURVEY NON-RESPONSE**

<b>Results of the Non-Response Rate</b>		
<b>Reason</b>	<b>Percentage</b>	<b>Accumulated Percentage</b>
The address listed is incomplete or does not exist	18.97%	18.97%
Nobody was home	18.71%	37.68%
The household occupant did not know the beneficiary in question	11.84%	49.52%
It was not possible to physically access the house	11.32%	60.84%
The beneficiary in question no longer lives at the address	10.47%	71.31%
Temporary Absences	7.91%	79.22%
The entire household has migrated	5.90%	85.12%
The beneficiary in question has never lived at the address	4.34%	89.46%
The beneficiary decided not to participate in the survey	2.90%	92.36%
Uninhabited household	2.86%	95.22%
The beneficiary in question has passed away	2.15%	97.37%
Minor under the age of 15 with no guardian present	1.34%	98.71%
Other	0.97%	99.68%
Incomplete or interrupted interview	0.33%	100%
<b>Total</b>	<b>100.00%</b>	

Despite the fact that language was not a criteria used for the sample design and that one of the reasons for non-response (physically impossible to access household) might arguably be more relevant for indigenous affiliates than non-indigenous, indigenous affiliates still account for 9% of the dataset, which is comparable to the national rate of 9.8%. Other prominent reasons for non-response, such as the beneficiary not living at the address are unlikely to vary systematically across indigenous and non-indigenous affiliates. Indeed, the top five reasons account for 71.31% of the total non-response rate and are all typical reasons encountered when trying to collect data from pre-determined addresses. Thus, there is no reason to assume that non-response will introduce bias into the results.

The survey was designed to create a profile of the average *Seguro Popular* affiliate and as such asks a wealth of questions on the respondents' socio-demographic conditions, including whether or not they speak an indigenous language. The survey also asks in-depth questions about the respondents' use of healthcare services.

6,497 affiliates were identified as speaking Spanish only, 150 as speaking an indigenous language only, 497 affiliates as speaking an indigenous language and Spanish, 19 as speaking Spanish and another language that is not indigenous and 44 as either not knowing or not responding. In order to avoid missing data for the study's key independent variable of interest, those 44 observations were dropped. T-tests on the mean of key variables for those 44 observations compared to the rest of the sample showed that their average age was 5.86 years (compared to the sample's average of 27.17). It is reasonable to conclude that some of the 44 unknown observations may be a result of infant *Seguro Popular* affiliates who do not speak any language yet (an example of why using language as a measurement of indigenous at the individual level can be problematic). However, there is no immediate reason to assume that indigenous peoples are more likely to be represented in these 44 observations and further t-tests on variables not relevant to age (i.e. not income or education levels) show that household characteristics are similar between dropped observations and the sample. A regression of a dummy variable representing the dropped observations on the analysis' key dependent variable shows no significant relationship.<sup>g</sup>

In addition to the National Survey of *Seguro Popular* Beneficiaries 2010, the analysis model will also use data on the number of accredited *Seguro Popular* health clinics, made publicly available by SPSS in a catalog on their website, in each of the respondents' villages. A variable

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<sup>g</sup> See Appendix A for t-tests and regression

constructed by Mexico’s National Council on Population (CONAPO by its Spanish acronym) representing a state’s marginalization index is also included in the analysis.

## DESCRIPTIVE STATISTICS

**TABLE 2 - Socio-demographic and economic profile**

<i>Mean Value of Variables Collected in the 2010 National Survey of Seguro Popular Beneficiaries</i>			
	Indigenous	Non-indigenous	All
Percentage of female respondents	54.1	54.79	54.73
Age of respondent	33.21	26.57	27.17
Number of household members	4.92	4.6	4.63
Household expenditure on food (100 pesos)	576.64	725.47	712.03
Monthly personal income (100 pesos) (per individual respondent)	702.97	981.85	953.76
Percentage of respondents unemployed in past two months	65.67	69.99	69.59
Percentage of respondents with access to piped water in household or yard	75.89	88.68	87.53
Percentage of respondents with mud floor in household	24.57	11.15	12.37
Percentage of respondents with electricity in household	94.28	98.74	98.3
Percentage of respondents with sanitary facilities in household or yard	89.8	94.26	93.86
Percentage of respondents over the age of 15 with no education	26.37	8.18	10
Percentage of respondents over the age of 15 with primary level education only	47.04	38.22	39.1
Percentage of respondents over the age of 15 with secondary level education only	18.11	26.5	32.29
Percentage of respondents over the age of 15 with highschool or university level education	7.81	19.80	18.6

Across these two groups, there are some interesting differences in socio-demographic and socio-economic characteristics. 90.97% of the sample is non-indigenous, 9.03% is indigenous. Generally, the data supports arguments made in the introduction that indigenous peoples are poorer and more marginalized than non-indigenous people. Despite having a slightly lower unemployment rate than non-indigenous affiliates, indigenous affiliates earn, on average, 270 pesos (or 28.3%) less a month than non-indigenous

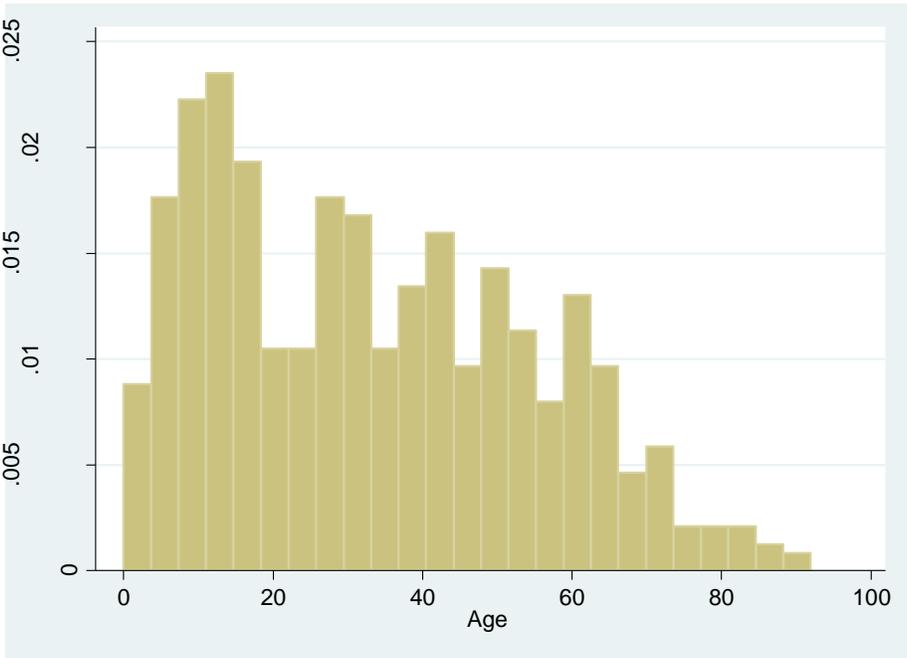
The average number of family members does not differ significantly between indigenous and nonindigenous beneficiaries. Both, however, are higher than the national average of 3.3. (UAC-SPSS 2010, p. 17) The average age of an indigenous affiliate is noticeably higher than a non-indigenous affiliate by almost six years. Given that life expectancy for indigenous peoples in

Mexico is lower than for non-indigenous, this difference could either be explained by a higher tendency for migration among working age indigenous peoples than non or by a higher child mortality rate for indigenous affiliates. Graphs 1A and 1B show that there may be some truth behind both theories. Indigenous affiliates have fewer infants under the age of three than non-indigenous and fewer affiliates in their 20s than non-indigenous. The graphs also show slightly more indigenous affiliates in their 60s and beyond than non-indigenous. This suggests a need to increase the offer of healthcare for both infants and elderly indigenous affiliates.

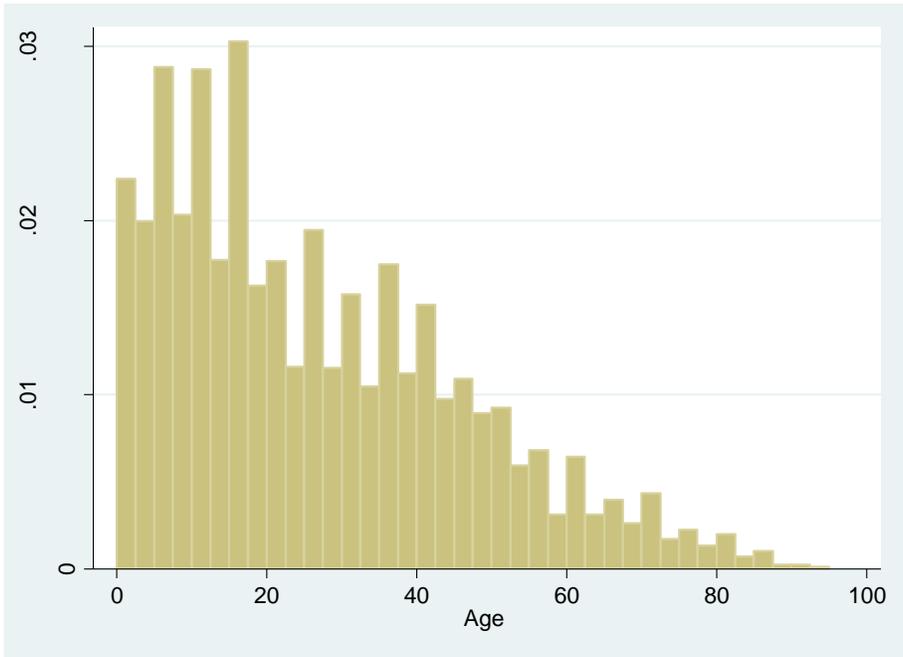
Studies have suggested that mud floors can pose significant risk to a household members' health as a source of contamination and hence increased incidence of respiratory, gastrointestinal and skin diseases. (UAC-SPSS, 2010 p. 18) The data shows that 24.5% of indigenous affiliates live in households with mud floors compared to only 11.15% of non-indigenous affiliates. Household conditions and the availability of basic services have been recognized as a strong determinant of healthcare utilization (UAC-SPSS, 2010). 24.11% of indigenous *Seguro Popular* affiliates lack access to piped water within their household or yard, this is approximately 10 percentage points higher than non-indigenous families. Similarly 10% of indigenous affiliates lack access to sanitary services in their household or on their property compared to 6% of non-indigenous.

Education is another strong determinant of healthcare utilization and on average, indigenous affiliates have less education than non-indigenous affiliates with 26.37% (aged 15 and over) having no education at all and 18.11% having completed secondary school compared to 26.5% of non-indigenous affiliates.

**GRAPH 1A – Histogram of Indigenous Respondents' Age**



**GRAPH 1B – Histogram of Nonindigenous Respondents' Age**



**TABLE 3 - Access to Public Health Services**

<i>Mean Value of Variables Collected in the 2010 National Survey of Seguro Popular Beneficiaries</i>			
	Indigenous	Non-indigenous	All
Percentage of respondents that they know they are entitled to Seguro Popular	98.43	98.32	98.33
Percentage of respondents who know of the Protection against Catastrophic Fund	24.11	31.98	31.27
Percentage of respondents who know of Insurance for a New Generation	44.36	57.97	56.74
Percentage of respondents who know of Health Pregnancy	56.41	66.02	65.15
Time to get to health clinic (hours)	4.53	2.05	2.27
Cost of getting to health clinic (pesos)	60.48	42.43	44.03
Waiting time for medical care (hours)	6.9	3.19	3.52
Number of Seguro Popular accredited health facilities in village	0.39	2.30	2.13
Percentage of respondents charged for medical care	13.91	21.59	20.9

The percentage of affiliates who know they have a right to use *Seguro Popular* is on average very high and there is little difference between indigenous and non-indigenous affiliates. The high percentage of respondents knowing that they are entitled to *Seguro Popular* is unusual and raises potential concerns about survey methodology. Perhaps for example, there is an introduction speech to the survey that informs respondents they have been chosen to answer questions because they are *Seguro Popular* affiliates. An evaluation of *Seguro Popular*'s sister program, SMNG, noted that 8% of respondents did not know their entitlement. (CONEVAL 2009, p.9) Indeed, knowledge of the various sub-components and programs of *Seguro Popular* in this study's sample is much weaker, with indigenous peoples tending to have less, on average, knowledge of these components than non-indigenous affiliates. Knowledge of entitlement is an important contributor to effective access (it is hard to use a service or program if you do not know that you are able to do so), however it is essential to stress that knowledge alone is not sufficient. An affiliate may know they are entitled to *Seguro Popular*, but if they do not know that they must attend a certain health clinic or present a particular document, then knowing that they *could* use *Seguro Popular* does not necessarily translate into knowing how to use it and therefore actual access. This data could offer support for the hypothesis that communication

methods are important in determining access to health services and that the current methods used could be improved, in many instances, for indigenous affiliates.

Geographic access to health services is also clearly more difficult for indigenous affiliates than non-indigenous. The average transport time for an indigenous affiliate is almost two and a half hours longer than for a non-indigenous affiliate and average cost is approximately 20 pesos more. Once at the health facility, an indigenous beneficiary faces an average waiting time of almost seven hours. This is three hours and 11 minutes longer than the average waiting time for a non-indigenous affiliate. This data is indicative of greater barriers to access and may support earlier theories that communication between medical and administrative staff and indigenous beneficiaries may be poor or that indigenous beneficiaries may face discrimination by service providers. Finally, a non-indigenous affiliate has an average of 2.3 *Seguro Popular* accredited clinics in their town or village, whereas an indigenous affiliate, on average, has 0.4 – again supporting the earlier assertion that the correlation between being indigenous and living in rural areas could result in less access to health services provided by *Seguro Popular* as they have focused their accreditation efforts on urban facilities. If a medical facility is not accredited to the SPSS system, then *Seguro Popular* affiliates will be unable to use their policies to cover healthcare.

**TABLE 4 - Use of health services**

<i>Mean Value of Variables Collected in the 2010 National Survey of Seguro Popular Beneficiaries</i>			
	Indigenous	Non-indigenous	All
Percentage of respondents who have been sick or injured in the past three months	31.9	33.5	33.3
Percentage of respondents who sought medical care	90.53	92.93	92.74
Percentage of respondents whose medical care was fully covered by Seguro Popular	92.44	77.99	79.16
Percentage of respondents who used Seguro Popular the last time they were sick	75.11	79.77	79.35

In accordance with the literature, indigenous affiliates report being sick in the last 3 months at a slightly lower rate than non-indigenous; similarly a smaller percentage sought medical care if

they did become sick. These differences are not as large as one might expect, however and when asked whether their medical care had been covered by *Seguro Popular* – 92.44% of indigenous affiliates responded that they had been fully or partially covered compared to only 77.99% of non-indigenous affiliates. Nevertheless, as expected the percentage of indigenous affiliates who accessed health services through *Seguro Popular* the last time they were sick is lower than the percentage for non-indigenous.

### **DATA ANALYSIS PLAN**

The remainder of the paper will employ both an Ordinary Least Squares Linear Probability Model (LPM) and a binomial Maximum Likelihood Estimation Logistic (Logit) model to ascertain whether this relationship remains true when controlling for other influential and correlated factors. The logit model produces consistent estimates of the standard errors and efficient estimates of the coefficients, while the ordinary least squares coefficients are more easily interpretable. As the analysis uses cross-sectional data and dichotomous dependent variables and seeks to compare the likelihood of indigenous *Seguro Popular* affiliates using their policies with that of non-indigenous, the LPM is appropriate. However, LPM provides no constraint for the predicted probability to lie between 0 and 1, meaning it could predict negative coefficient values or probabilities greater than 1, neither of which are going to have any practical explanation. It is also potentially unreasonable to assume that there will be a straight linear

relationship between the independent and dependent variables, which is why the analysis also uses a logit model.<sup>h</sup>

The analysis hypothesizes that, on average, indigenous affiliates are less likely to access healthcare services through *Seguro Popular* than non-indigenous affiliates. To address this hypothesis, the study estimates the following Linear Probability Model:

<p><b>Model:</b> <math>\bar{Y} = \beta_0 + \beta_1 \text{indigenous} + \beta_2 \text{time} + \beta_3 \text{cost} + \beta_4 \text{knowledge} + \beta_5 \text{numhpcproviders} + \beta_6 \text{demographiccontrols} + \beta_7 \text{geographiccontrols} + \beta_8 \text{householdcontrols} + e</math></p>
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In the first version of this model  $\bar{Y}$  is a binary variable measuring whether or not an affiliate used their *Seguro Popular* insurance policy the last time they sought medical care, and in the second model is a binary variable that measures whether or not an affiliate used their *Seguro Popular* insurance if they were sick in the three months prior to answering the survey and chose to seek medical care. The decision to look at this subset of the sample came from the lack of data for all of the survey's respondents with regard to the last time they sought medical care. In some cases, it is possible that a respondent had not required medical attention in over eight years. As *Seguro Popular* only began implementation eight years ago, measuring whether those respondents tried to access medical care with a *Seguro Popular* policy could introduce bias into the model. In order to minimize that bias, the subset is limited to those respondents that both reported illness in the past three months and sought medical care.

The *indigenous* variable is a dummy variable equal to 1 if the affiliate speaks an indigenous language (the variable is constructed to include affiliates who only speak an indigenous language

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<sup>h</sup> If the coefficients (once transformed) of the Logit model are reasonably similar to the LPM, then it can be assumed that the latter was an adequate model to use.

and those who speak Spanish as well as their indigenous language) and equal to 0 if the affiliate only speaks Spanish or speaks Spanish and another language that is not indigenous. This is the key independent variable of interest.

In order to measure the extent to which indigenous affiliates are constrained in their use of *Seguro Popular*, controlling for the most likely other predictors of program use, a set of independent variables which are arguably representative of access barriers are also included in the model. The *time* variable is a continuous variable measuring the number of minutes it took a respondent to reach the nearest medical facility the last time they sought medical care. The *cost* variable is a continuous variable measuring the amount of money that the affiliate spent on transport in order to reach a medical facility the last time they needed care. The *knowledge* variable is a dummy variable set equal to 1 if an affiliate knows that they are entitled to use their *Seguro Popular* policy when seeking medical care and 0 if they do not. The *numhcproviders* variable is a continuous variable that measures the number of *Seguro Popular* accredited health facilities in the affiliate's area of residence.

There are three sets of controls included in the model. The *demographic*, *geographic* and *household* sets of covariates control for differences between indigenous and non-indigenous affiliates that could explain part of the variation in the use of the *Seguro Popular* insurance policy when seeking medical care. These include: age; sex; income; marginalization index of residence location; number of family members in a house, medical history and water access. Finally,  $\beta_0$  represents the intercept term, while  $e$  is a random error term.<sup>i</sup>

The expectation for the model is that the coefficient on *indigenous* will be negative, indicating a lower probability of indigenous affiliates using their *Seguro Popular* insurance policy than

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<sup>i</sup> A summary list of the model's variables and their descriptions can be found in Appendix B.

non-indigenous affiliates, holding other factors influencing the utilization of *Seguro Popular* constant.

Table 5 shows a summarized version of the correlation matrix for the model's dependent and key independent variables.<sup>j</sup> Given the small coefficients in the matrix and the fact that none are nearing 1, the model is unlikely to encounter problems of co-linearity.

**TABLE 5**

	Use <i>Seguro Popular</i>	Indigenous	Time to Clinic	Transport Cost	Know Right to SP	Number of accredited service providers
Use <i>Seguro Popular</i>	1.0000					
Indigenous	0.0023	1.0000				
Time to Clinic	0.0060	0.0340	1.0000			
Transport Cost	0.0453	0.0351	0.2315	1.0000		
Know Right to SP	-0.0234	0.0024	0.0047	0.0009	1.0000	
Number of Accredited Service Providers	-0.0005	-0.1072	-0.0069	-0.0417	0.0291	1.0000

<sup>j</sup> A full version of the correlation matrix for all of the model's variables can be found in Appendix C. The correlation coefficient values are comprised between  $\pm 1$ , with values that are closer to one indicating a strong correlation between the variables.

## RESULTS

Table 6A shows the results of using both the ordinary least squares LPM and binomial logit techniques to estimate the effects of the collected data on the probability of our full sample using *Seguro Popular*. Table 6B estimates the same probability for those sample affiliates who reported being sick in the three months prior to the survey and having sought healthcare. Both tables show the base coefficients for the logit model, the percentage point impact after logit and the OLS LPM coefficients. The percentage point impact in the second column for dichotomous variables such as *indigenous* represents the percentage point increase or decrease in the probability of using *Seguro Popular* if you are an indigenous affiliate. For continuous variables, such as the time it takes to get to the clinic, the percentage point impact is representative of the increase or decrease in the probability of using *Seguro Popular* associated with a one standard deviation change in the amount of minutes it takes a respondent to reach their nearest health clinic.<sup>k</sup>

Holding the access barriers, demographic, household and geographic characteristics constant, the OLS coefficient on indigenous implies that the probability of an indigenous affiliate using *Seguro Popular* is, on average, 4 percentage points lower than non-indigenous affiliates. The coefficient is significant at the 10 percent level. By and large, the logit model's results are compatible with those of the OLS regression. The difference in the predicted probability that an indigenous affiliate will use their *Seguro Popular* policy as opposed to a non-indigenous affiliate is slightly smaller in the logit model as opposed to the OLS and is significant at the 20% level, as opposed to the 10%. Holding all else constant, the logit model estimates that the likelihood of

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<sup>k</sup> For ease of interpretation, Table 7 shows the standard deviation for all the regression model's continuous variables.

indigenous affiliates using *Seguro Popular* when seeking healthcare is 2 percentage points lower than non-indigenous.

By the logic of the model used to estimate Table 6A, an affiliate who knows they have the right to use *Seguro Popular* is between 13 and 17 percentage points less likely to use *Seguro Popular* when accessing health services than an affiliate who does not know they have that right. This result is counter-intuitive unless it is indicative of a widespread poor reputation with regard to *Seguro Popular* sponsored health services. While literature and on-the-ground evidence would suggest this to be true in part, the magnitude on the coefficient is too large for that to be the only explanation. However, the results from Table 6B show the same negative relationship, but with a much smaller coefficient. Respondents are now 4 percentage points less likely to use their policy if they know they have the right to access *Seguro Popular*. This suggests that by measuring the whole sample without the definitive knowledge that a respondent was an affiliate of *Seguro Popular* the last time they got sick, the coefficient on knowing one's right to use *Seguro Popular* was biased downwards.

Restricting the sample to respondents who reported sickness in the past three months and who then sought medical care to estimate the probability that they will have done so with *Seguro Popular* indicates that an indigenous affiliate is between 6 and 6.2 percentage points less likely to use their *Seguro Popular* insurance policy when seeking medical care. On this occasion, the OLS and logit models' results are almost exactly the same and both are statistically significant at the 10% level.

Both models show that the other potential access barrier to have a significant relationship with the likelihood of an affiliate using their *Seguro Popular* policy is the cost of transport to get to

the clinic. The direction of the relationship is at first glance counter-intuitive. For every additional peso that transportation to the clinic costs, an affiliate is, on average, (between 0.02 and 0.03 percentage points) more likely to use their policy. Conventional theory would suggest that a higher transport cost would be prohibitive when trying to access healthcare. However, the coefficient is very small and higher transport costs are likely to be associated with greater distances between households and clinics, suggesting that these affiliates live in rural areas. As mentioned previously, the SPSS has been more successful at upgrading and accrediting health centers in urban areas as opposed to rural, as they are both easier to reach but also closer to the established standards than many of the rural health clinics. This would indicate that affiliates living further away from health clinic centers have less service provision choice and would explain why the greater the cost of transport, the more likely an affiliate is to use their policy.

Being female and personal monthly income levels also have a statistically significant relationship with the probability of using *Seguro Popular* to access healthcare. Both models estimate that holding all else constant, a female affiliate is, on average, between 3.5 and 4 percentage points less likely to use *Seguro Popular* than a male affiliate. This is consistent with the findings of the Universidad de Chapingo study that showed households headed by females were less likely to use *Seguro Popular*. Personal monthly income has a very small (ranging between 0.0004 and 0.003 percentage points) but highly significant impact on the probability of using *Seguro Popular*. This result may seem counter-intuitive as a person with a higher income level should arguably enjoy a greater choice of healthcare providers, however the very small magnitude indicates that perhaps this relationship is indicative of the difference between a rural family who can afford transportation to an urban center to use *Seguro Popular* and one who

cannot, rather than the difference between a family who can afford private healthcare and one who must rely only on *Seguro Popular*.

All the variables measuring the marginalization level of a residence are significant in both models except for residences in very highly marginalized states. The reference category comprises states with very low marginalization levels. Therefore, on average, affiliates living in low, medium and high marginalized states are between 7 and 9.1 percentage points less likely to use *Seguro Popular* than affiliates living in very low marginalized states. Again, this holds true with the literature's indications that *Seguro Popular* accredits more health centers in urban areas than rural. However, it is counter-indicative to the reform's mandate requiring *Seguro Popular* to target and prioritize rural areas.

Interestingly, the models – overall - do not estimate education to be a strong statistically significant predictor of using *Seguro Popular*. Both models indicate that affiliates with no education, or only primary or secondary level education are less likely to use the policy than affiliates with a high school education (the reference category), but most of these relationships are statistically insignificant. However, when measuring the probability of an affiliate who was sick in the three months prior to the survey and who sought medical care, having a primary level education is associated with a 5.6 percentage point decrease in the likelihood of an affiliate using *Seguro Popular*, holding all else constant and compared to an affiliate with a high-school education, and is significant at the 10% level. Most studies are more conclusive in finding a strong association between healthcare utilization and education. The make-up of *Seguro Popular*'s target population and the other government programs that they receive may explain why this is not the case in the present study. For example, every affiliate of Mexico's cash-

conditional transfer program, Oportunidades, is automatically enrolled in *Seguro Popular*.

Oportunidades has a strong preventative and informative healthcare component. Perhaps access to this type of information becomes a stronger predictor of whether one will use public healthcare provision rather than a conventional classroom education.

Finally, the model is likely to have encountered omitted variable bias because information is lacking on affiliates' medical histories, arguably correlated with both being indigenous and with whether or not affiliates decide to use their policy. The low  $R^2$  and pseudo  $R^2$  suggest there may be many other determinants of healthcare access through *Seguro Popular* for indigenous affiliates; however the  $R^2$  is not a tool that easily carries over from OLS regressions to LPM or logistic regressions. When the dependent variable is continuous, it is possible to imagine a situation in which the  $R^2$  equals 1: All the data lie exactly on the regression line. This is not possible when the dependent variable is binary and accordingly the  $R^2$  is not a particularly useful statistic here. (Stock and Watson, 2011, p.385)

Table 6A. --Determinants of Probability of using *Seguro Popular* Insurance Policy

Variable	Logit		OLS
	Base (1)	Percentage Point Impact (2)	Base (3)
Intercept	-.1341 (.2430)		1.474*** (.0067)
<i>Personal</i>			
Indigenous	-.1350 (.1091)	-2.4	-.0400* (.0242)
Female	-.2164*** (.0581)	-4.0***	-.0521*** (.0178)
Age	-.0003 (.0015)	-.006	-.0005 (0.0178)
Income	.0001*** (.0000)	.003***	3.56e-05** (1.41e-05)
Sickness in Past 3 Months	.2445*** (.0575)	5.0***	.0418*** (.0154)
<i>Education</i>			
No Education	-.0145 (.1088)	.2	-.0275 (.0309)
Primary	-.1427 (.0900)	-2.6	-.0339 (.0280)
Secondary	-.1479 (.0970)	-2.7	-.0232 (.0307)
<i>Household</i>			
Number of members	.0435*** (.0153)	0.80***	.0090** (.0043)
Access to Piped Water	-.0240 (.0211)	-0.4	-.0083 (.0154)
<i>Geographical</i>			
Low Marginalization	-.4177*** (.1053)	-7.0*** (.1717)	-.0559* (.0334)
Medium Marginalization	-.4345*** (.1087)	-7.4***	-.0799*** (.0314)
High Marginalization	-.4119*** (.1052)	-7.0***	-.0867*** (.0298)
Very High Marginalization	.0711 (.1160)	1.3	.0258 (.0357)
<i>Access</i>			
Time to clinic	-.0004 (.0003)	-0.006	-3.52E-05 (-6.16E-05)
Cost of transport to clinic	.0013*** (.0003)	0.02***	.0002*** (.0000)
Knowledge of right to access	-.7702*** (.1946)	-17.0***	-0.125*** (.0461)
Number of SP accredited service providers	-.0078 (0.061)	-0.1	-.0012 (.0015)
R-squared			.0121
Pseudo R-squared	0.0225		
Observations	6867		6867

\* =0.1 alpha level

\*\*=0.05 alpha level

\*\*\*= 0.01 alpha level

Table 6B. --Determinants of Probability of using *Seguro Popular* Insurance Policy

Variable	Logit		OLS
	Base (1)	Percentage Point Impact (2)	Base (3)
Intercept	-.4466 (.4710)		.3928*** (.0995)
<i>Personal</i>			
Indigenous	-.3268 (.2090)	-6.0*	-.0616* (.0372)
Female	-.1752* (.1037)	-3.5*	-.0342* (.0204)
Age	-.0002 (.0024)	-.003	-.0000 (.0005)
Income	.0002*** (.0000)	.0004***	.0005** (.0000)
<i>Education</i>			
No Education	-.0051 (.1924)	-.1	-.0012 (.0407)
Primary	-.2865* (.1732)	-5.6*	-.0561 (.0364)
Secondary	-.2544 (.1924)	-4.8	-.0504 (.0400)
<i>Household</i>			
Number of members	.0258 (.0100)	0.50	.0050 (.0054)
Access to Piped Water	.2006 (.1506)	3.8	.0362 (.0277)
<i>Geographical</i>			
Low Marginalization	-.4790** (.1966)	-9.0**	-.0559* (.0334)
Medium Marginalization	-.4918** (.1988)	-9.1***	-.0799*** (.0314)
High Marginalization	-.4213** (.1989)	-7.9**	-.0867*** (.0298)
Very High Marginalization	-.2300 (.2189)	-4.4	.0258 (.0357)
<i>Access</i>			
Time to clinic	-.0009 (.0009)	-0.02	-.0001 (.0001)
Cost of transport to clinic	.0017*** (.0004)	0.03***	.0003*** (.0000)
Knowledge of right to access	-.2175 (.3454)	-4.0***	-.0453 (.0741)
Number of SP accredited service providers	-.0014 (.0100)	-0.02	-.0004 (.0020)
R-squared			.0262
Pseudo R-squared	0.0222		
Observations	2051		2051

\* =0.1 alpha level

\*\*=0.05 alpha level

\*\*\*= 0.01 alpha level

Table 7 –Interpreting Logit Percentage Point Impacts: Standard Deviation for Models'  
Continuous Variables

Variable	Standard Deviation
Age	19.91
Income (pesos)	710.441
Number of household members	1.89
Time to clinic (mins)	103.26
Cost of transport to clinic (pesos)	146.13
Number of SP accredited Service Providers	5.10

### POLICY IMPLICATIONS AND CONCLUSIONS

The key finding of this paper is that indigenous affiliates use their *Seguro Popular* policies slightly less than their non-indigenous counterparts, controlling for four common access barriers as well as demographic, household and geographic characteristics. Furthermore, the lack of any significant associations between access barriers and the probability of using *Seguro Popular* implies that perhaps the reasons for the difference are not easily measurable and constitute discrimination. However, before being able to make such an assumption and analyze what this may mean for policy-makers, we must first address several issues with the survey, dataset and model that would need to be amended for an improved evaluation.

Crucial to finding out why indigenous affiliates use their *Seguro Popular* policies less than their non-indigenous counterparts is knowledge of where they are receiving their healthcare instead. The survey allows us to see what other medical services the respondents have access to. When asked where they received medical attention if they reported both sickness in the past

three months and going to the Doctor, 7% reported using social security facilities and 14.66% reported using a private Doctor. 9.34% reported using Ministry of Health facilities and 57.19% reported using “other institutions.” This, unfortunately, is a large deficiency in the survey. Other institutions include community health centers, specialized hospitals and civil institutions. Presumably, respondents were not sure whether their community health center belonged to the Ministry of Health and had been accredited by *Seguro Popular*, or whether it still belonged to the generic public health system in place before the implementation of *Seguro Popular*. Each health center or hospital has been named by the respondent, so it would be possible to cross-check those names with the catalog provided by *Seguro Popular* of its health clinics. This, of course, would assume that *Seguro Popular* keeps their catalog up to date – and again, evidence on the ground calls that assertion into question. The frequency, one of the highest in Latin America, at which people move back and forth between the formal and informal sector in Mexico should also be considered. Perhaps utilization of social security institutions is being under-reported because affiliates know that their *Seguro Popular* policy is contingent on them not having medical coverage from another provider. Therefore, they know they have the right to use *Seguro Popular* but in actual fact – they are currently using a social security institute. They are uncertain whether they will maintain employment in the formal sector and so do not want to lose access to *Seguro Popular* by openly admitting that they also have access to a social security institute.

It would also be important to compare these results with models that use different ways of measuring access to *Seguro Popular* in Mexico such as tracking spending on healthcare as a percentage of household expenditure levels. Another measurement of whether *Seguro Popular*

is reaching indigenous affiliates as well as it reaches non-indigenous affiliates would be to measure health outcomes. Should these analyses find the same implications that this study found then policy-makers would need to find a way of ensuring more equitable access to medical services through *Seguro Popular* for indigenous affiliates. As only one of the access barriers used in this model proved to be statistically significant, and not in an inhibitive role, attention should be given to evaluating and improving service delivery factors that this analysis was not able to include due to the lack of data. For example, the presence of an interpreter who spoke indigenous languages at a health clinic or treatments that tried to incorporate traditional medicine into the Western healthcare model would be likely to increase the probability of an indigenous affiliate using *Seguro Popular's* services.

That *Seguro Popular* actually fully or partially covered more indigenous affiliates than non-indigenous affiliates would seem to imply that discrimination is not present at the point of charge. It does bear saying, however, that many of the *Seguro Popular* accredited health facilities also continue to provide social assistance healthcare by the Ministry of Health for all those who do not have access to Social Security or *Seguro Popular*. As per Mexico's General Health Law, an indigenous person is exempt from any fee or charge when using Ministry of Health services. It is therefore difficult to discern which portion of indigenous affiliates had their healthcare covered by *Seguro Popular* and how many were exempt from fees for being indigenous and in a Ministry of Health facility. Answers to these types of questions would be facilitated by more data collection on behalf of the healthcare providers themselves.

Unfortunately, it is very difficult to quantify or collect data for many of the influences or circumstances which could explain the difference in utilization rates between indigenous

affiliates and non-indigenous affiliates. For example, capturing whether an affiliate distrusts their Doctor with an instrument like a household survey is likely to prove very challenging. Thus, policy efforts should also be focused on increasing indigenous affiliates' participation in the whole system rather than just the act of seeking healthcare. Forming focus groups with service providers and citizen monitoring networks in indigenous communities would be a significant step towards inclusion and giving voice to indigenous affiliates. Likewise, the addition of medical staff to these focus groups might help to sensitize them as to the needs of their indigenous patients and result in fewer tendencies for discrimination at the moment of service provision.



**APPENDIX B**  
**VARIABLE DESCRIPTIONS**

VARIABLES

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Indigenous Affiliate

Time to Clinic (minutes)

Cost of Transport to Clinic (pesos)

Knowledge of Right to Use SP

Female Affiliate

Number of SP Accredited Health Clinics in Affiliate's town

Affiliate's Age

Number of Household Members

Affiliate has No Education

Affiliate completed Primary Education

Affiliate completed Secondary Education

Affiliate's Monthly Average Income in Nov. and Dec. 2010

State of Residence has Low Marginalization

State of Residence has Medium Marginalization

State of Residence has High Marginalization

State of Residence has Very High Marginalization

Affiliate has Access to Piped Water in Household or Yard

Affiliate registered Sickness in 3 months prior to Survey

**APPENDIX C  
CORRELATION MATRIX**

<i>Use Seguro Popular</i>	Indigenous	Time to Clinic	Transport Cost	Know Right to SP	Number of accredited service providers		
female	-0.0567	-0.0040	-0.0033	0.0088	-0.0098	0.0086	1.0000
age	-0.0107	0.0955	0.0358	0.0195	-0.0039	-0.0329	0.0421
income	0.0393	-0.0239	0.0256	0.0007	-0.0395	0.0286	-0.1919
pipewater	0.0141	-0.1111	-0.0213	-0.0176	-0.0154	0.0860	0.0159
num_house_~s	0.0300	0.0487	0.0212	-0.0046	-0.0025	0.0240	-0.0200
noeduc	-0.0026	0.0673	-0.0010	0.0114	0.0109	-0.0020	0.0019
primary	-0.0051	0.0425	0.0000	-0.0093	-0.0076	-0.0225	-0.0381
secondary	-0.0040	-0.0549	0.0074	0.0032	-0.0044	0.0220	0.0220
lowmarg	-0.0090	-0.1461	0.0140	-0.0144	-0.0154	-0.0172	0.0057
medmarg	-0.0212	-0.1448	0.0021	-0.0110	-0.0178	0.0678	0.0043
highmarg	-0.0332	0.0874	-0.0132	0.0010	0.0079	-0.1761	-0.0003
vhighmarg	0.0553	0.2904	0.0099	0.0408	0.0432	-0.1055	0.0009

	age	income	pipewater	num_house_holds	noeduc	primary	secondary
age	1.0000						
income	0.1951	1.0000					
pipewater	0.0223	0.0360	1.0000				
num_house_holds	-0.2517	-0.0456	-0.0661	1.0000			
noeduc	-0.0051	-0.1144	-0.0409	-0.0497	1.0000		
primary	0.0271	-0.0688	-0.0038	0.0336	-0.3931	1.0000	
secondary	-0.0045	0.0909	0.0182	0.0148	-0.2458	-0.5541	1.0000
lowmarg	-0.0174	0.0054	0.0742	-0.0158	-0.0140	-0.0071	0.0246
medmarg	-0.0059	0.0262	0.0695	0.0645	-0.0164	-0.0067	0.0202
highmarg	0.0091	-0.0285	-0.0807	-0.0534	0.0057	0.0016	-0.0082
vhighmarg	0.0221	-0.0575	-0.1221	0.0131	0.0404	0.0323	-0.0624
	lowmarg	medmarg	highmarg	vhighmarg			
lowmarg	1.0000						
medmarg	-0.2846	1.0000					
highmarg	-0.3736	-0.3259	1.0000				
vhighmarg	-0.2430	-0.2120	-0.2783	1.0000			

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