**Seguro Popular: Health Insurance or Income Transfer Program? A Difference in Differences Evaluation of Health, Utilization, and Employment, Five Years after Program Introduction**

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Abstract:

This paper evaluates the effects of Mexico's Seguro Popular program on health care utilization and health outcomes for a group of poor, urban families five years after introduction.  Seguro Popular, or "Popular/People’s Insurance", is a major health system reform introduced in 2002 and achieving near universal coverage by 2013. The program provides free or subsidized health insurance to Mexican families not covered by formal social security programs, nearly 50 percent of the population.  Most previous studies of this program have found little to no effect of program participation on utilization and health, but some decrease in health spending.  These results imply that the program acts more as a transfer program than a health-improvement program, but only look at outcomes less than one year after introduction.  My analysis spans the years 2002 through 2009, and focuses on families that received access to the program in 2004 or later.  I find changes in utilization of medical care, both through substitution toward clinic usage and away from pharmacies and traditional healers and through an increase in overall usage of all forms of medical care.  Health improvements were found in the form of decreased reporting of inability to perform usual daily activities for the entire sample.  No health effects were found for children, perhaps because of the penetration of Oportunidades in this population. The income and productivity benefits of the program are less clear.  The program decreases household medical spending for beneficiary families, but members of these same families also see a decline in the likelihood of employment, and hours and weeks worked across all age groups one year post-introduction.  However, employment effects are smaller and not significant five years later.

1. **Introduction**

For both economic and political reasons, politicians and policy makers have debated for years the best ways to improve access to health care for the poor and the vulnerable while lowering out of pocket spending, which can push families further into poverty. Links between improvements in health and increasing labor force participation have also been detected (Strauss and Thomas (1998), Thomas et al. (2004)), providing further economic justification for social health insurance programs.

Since the 1960s, the United States has provided some measure of health care protection to its less affluent residents through Medicare and Medicaid. More recently, there have been attempts to extend this access to all U.S. residents through single-payer and nationalized health care systems, such as those in Canada, Great Britain, and several other nations. Developing countries have also embraced the goal of ensuring access to adequate health care for all. Colombia, Mexico, and Vietnam are among those that have instituted social health insurance programs to provide health care coverage for a sizable portion of their populations.

While programs in the U.S. and other developed nations have been shown to improve both access to health care and health outcomes, there is less evidence in the developing country case. Currie and Gruber (1996) and Card et al. (2008) found increased health care utilization and improved health as a result of the Medicaid and Medicare programs in the U.S., respectively. On the other hand, Mexico has seen success in increasing health care utilization and improving child health with the PROGRESA (now Oportunidades) program, (Gertler 2004), but that program is limited to preventative care and low-level interventions and its coverage is limited in scope. In the Colombian case, Camacho and Conover (2013) found that the Régimen Subsidiado program had a positive and significant impact on infant birth-weights, but they could not find evidence of a significant effect of the program on health access or other health outcomes. This lack of evidence of health impacts suggests that these programs may be operating as income transfers rather than having any role to play in improving population health.

Mexico’s Seguro Popular universal health insurance program, introduced in 2003, provides an opportunity to measure the impact of a large scale health insurance program in a developing country on health, health care utilization, and financial protection. So far, the evidence is mixed. A series of studies using data from the official Seguro Popular evaluation, using randomized study design, have found little to no impact on health and utilization. Far from being definitive, however, these studies only span about ten months of program coverage during a period when the program was just getting started. Given that the number of diseases, treatments and medications covered, as well as the penetration into rural areas increased drastically between 2004 when it was rolled out and 2012 when full coverage was achieved (Knaul et al., 2012), there is reason to believe that health and utilization impacts may yet be detected in the longer run. Knowledge of the program was also low in the early days of its implementation, and many families were unaware of their rights and available benefits (King et al., 2009).

One area where Seguro Popular does appear to be successful, however is financial protection. One of the goals of the reform that spawned Seguro Popular was to improve protection from excessive health care spending for the poor and vulnerable, and the reform appears to be successful in the aggregate. Households affiliated with SP had lower spending on health care services and were about half as likely to face catastrophic health expenditures as unaffiliated households (Galárraga, Sosa-Rubí, Salinas-Rodríguez, & Sesma-Vázquez, 2010; King et al., 2009).

In this paper, I perform the first measurement of program impacts five years after introduction, a time frame I am calling the “medium term”.[[2]](#footnote-2) I follow a sample of 4,229 individual over seven years, with measurements taken in 2002, 2004 and 2009. My sample consists of households admitted to the program in 2004 and those admitted between 2007 and 2009. My findings show that the impacts of SP five years after introduction are much stronger than those found less than one year after affiliation. I find changes in utilization of medical care, both through substitution toward clinic usage and away from pharmacies and traditional healers and through an increase in overall usage of all forms of medical care (after 5 years, adults are 6% more likely to have had a health care visit in the last month and children are 12% more likely). Health improvements were found in the form of decreased reporting of inability to perform usual daily activities for adults over sixty (4 days fewer per month five years later) and for the entire sample (0.3 days fewer). No health effects were found for children, perhaps because of the penetration of *Oportunidades* in this population.

The income and productivity benefits of the program are less clear in this population. The program decreases household medical spending for beneficiary families (by 82 pesos per month, about 150% of the 2009 daily minimum wage), but members of these same families also see a decline in the likelihood of employment across all age groups one year post-introduction (a 5% decrease in the likelihood of being employed) but effects are smaller and not significant five years later. While coefficients on male employment are negative, the bulk of the result appears to be driven by a decrease in female employment. Preliminary results suggest that the impact on hours worked is similar. No effects on school enrollment have been found.

The organization of this paper is as follows: Section Two gives an explanation of Mexico's formal social security system and gives a detailed description of the Seguro Popular program. Section Three describes my empirical methodology, including the difference-in-difference methodology used to measure the main effects of the program, the two stage least squares procedure, and the reasoning behind the selection of the comparison sample. Section Four describes the data set used for the evaluation, the Encuesta de Evaluación de los Hogares Urbanos, a survey of the recipients of the urban phase of the Oportunidades program. Finally, Section Five describes the determinants of selection into the Seguro Popular program, and the results of my difference-in-difference analysis, and Section Six concludes and suggests avenues for further research.

1. **Background**

Since 1943, workers in Mexico’s private formal employment sector, as well as their families, have been entitled to receive health care services for little to no cost in facilities run by the Mexican Social Security Institute (IMSS)[[3]](#footnote-3) while the self-employed, the unemployed, and those employed in the informal sector were only entitled to services from the Ministry of Health. These services, available in state and federally run facilities, were of heterogeneous quality and value. User fees were subsidized and means-tested, but still contributed to high out of pocket expenses in this sector. Additional out of pocket payments were also incurred by patients due to shortages of medicines. Another source of health care services for the insured and uninsured alike is the poorly regulated private sector (Frenk et al. (2006)).

By 2000, about 40% of the Mexico's population of nearly 100 million was covered by IMSS, while another 10% were covered by other forms of insurance. The remaining 50% of the population was uninsured, including the 2.5 million families who received basic health care services included in the Oportunidades program (Frenk et al. (2006)). In the same year, a World Health Organization assessment of health-systems performance ranked Mexico 144th in fairness of health care finance, although overall they were ranked 51st out of 191 countries. Further analysis by the Mexican government estimated that every year, 2 to 4 million households suffered from catastrophic health care payments (Knaul et al. (2006)).

In 2003, Mexico's General Health Law was reformed to increase protection for the uninsured by providing them with subsidized, publicly funded health care services. At the center of the new System for Protection in Health (SPS) is Popular Health Insurance or Seguro Popular (SP) (Knaul et al. (2006)). The new program is financed by both state and federal governments and beneficiary families. In order to increase the equity of public health financing, beneficiary families are entitled by law to an amount similar to that of families receiving formal social security benefits (such as IMSS services).

Part of the state-level decision to begin affiliating citizens with the Seguro Popular program included a negotiation between the state and federal government regarding affiliation targets[[4]](#footnote-4). The actual work of affiliating families is left to the state ministries of health, which are responsible for promotion of the program. This is done differently in each state, but can include billboards, trucks driving through neighborhoods with loudspeakers advertising the program, door-to-door canvassing, and booths set up in health clinics to facilitate affiliation. Affiliation is voluntary, and once families choose to enter the program, they are required to wait until the beginning of the following trimester to begin receiving services. Affiliation also needs to be renewed each year. This is believed to give states an incentive to offer a high quality of services, since state health funding is dependent on the number of affiliated families (Gakidou (2008), Gakidou et al. (2006), Frenk et al. (2006)). Figure 1 shows total affiliated families over the 7 years of program introduction.

Consistent with previous research on adverse selection into health insurance (see, for example, Chiappori and Salanie (2000)), affiliates with SP appear to exhibit selection on perceived, but not objective, measures of health (Spnkuch 2011). For this reason, many studies of the impacts of SP rely on intention to treat measures of treatment effects. The current study is able, however, to observe a sample of eventual program adopters for several years before adoption, and use them as a control group that has been selected in the same way as the earlier program adopters.

 Once a family chooses to enroll in the program, there is an income-based premium to pay (this is currently being waved in most cases), and the family must wait until the beginning of the next quarter for their affiliation to begin. Affiliated families receive a health card, which must be shown whenever they receive services at their local SP health facility. Once they are in possession of this card, the family receives treatment for covered diseases and health conditions for free. They also receive free emergency care from any state-sponsored health facility, not just those affiliated with Seguro Popular.

Seguro Popular benefits include diagnosis, treatment, and medication for all medical conditions covered in the programs Universal Catalog of Health Services (CAUSES). In 2004, this catalog included 91 essential health interventions and the medications associated with those medications. These interventions covered over 90 percent of the disease burden in Mexico (Seguro Popular 2007)[[5]](#footnote-5).

In addition to medical attention in their local SP facility, beneficiaries are entitled to consultations with specialists, second opinions, surgery, hospitalization, and laboratory tests. Another component of the Seguro Popular program is the Fund for Protection against Catastrophic Expenditures (FPGC). This fund directly finances care for high priority health conditions which frequently lead to catastrophic expenditure (defined as more than 30% of a households' income net of food spending). These conditions include AIDS, childhood cancers, cervical cancer, premature birth, and cataracts (Frenk et al. (2006), Gakidou et al. (2006)). Another common service covered by Seguro Popular is childbirth and antenatal care, which are fully paid for under the program (Sosa-Rubi)

1. **Method**

 There are two possible responses to a decrease in health care prices in the public sector First, families may substitute health care consumption in Seguro Popular facilities for health care consumption from outside providers. This substitution effect may or may not increase the total consumption of health care by households or the individuals within those households, but I do expect to see families choosing to consume more health care from public clinics. The other way that families will respond to the price decrease is through the usual price effect for normal goods. Once health care becomes less expensive for these families, I would expect to see them consuming more services overall, possibly in both types of facilities.

 Another possible outcome, one that is hinted at by previous results such as King et al (2009) and Spenkuch (2012) is that families were already choosing the optimal level of investment in health care, albeit at the expense of other consumption, and therefore a decrease in price will not change utilization. In this case, we would observe no change in utilization in this study.

Ultimately, though, the test of whether Seguro Popular is acting solely as an income transfer program or as a means for improving the health of poor Mexicans is whether we detect improvements in health. Even if families increase the amount of health care they consume, it is possible but not guaranteed that individual health will improve. On the other hand, without an increase in utilization, substitution toward public clinics, which may be of better quality than the types of private providers families were previously using (traditional healers and pharmacists), can improve health outcomes. In addition to looking at the health outcome variables contained in the data set, health status could be measured through changes in labor force participation, although this may be difficult to separate from income effects.

**The Natural Experiment**

Due to its cost, Seguro Popular was introduced in stages. This occurred at both the geographic and population level. The population level goal was to affiliate 14.3% of Mexico's 12 million uninsured families per year over 7 years. By law, affiliation was targeted to the poorest quintile, as well as rural and indigenous populations. Figure 1 shows affiliated families by year up to 2009. By 2012, there were 52 million affiliates (Knaul et al., 2012)

At the geographic level, each state made the decision to sign on to the program and offer SP to its citizens individually after negotiating with the federal government. While there were no clear cut rules for when states began affiliating their citizens, some patterns emerged among the early adopters. The states which chose to affiliate during the pilot phase of the program tended to have smaller populations, and their health ministers tended to be friends of Julio Frenk, the Minister of Health who developed the program (Gakidou 2008). The actual geographic roll-out occurred as follows: Out of 32 states, 5 joined the program in 2002, 17 joined in 2003, 7 more joined in 2004, and the final 4 states were covered in 2005 and 2006.

Coverage within states has also been variable. Seguro Popular was specifically intended to be rolled out at the health center level, with areas being permitted to affiliate citizens only if they have sufficient health care facilities and human resources. Since health care facilities are not administrative units, coverage is at the municipio (or district) level, with some affiliated municipios having qualifying clinics and some not (Gakidou et al. 2006). Table 1 shows the number of municipios covered by year. This variation at the municipio level forms the basis of this paper’s analysis.

**Difference-in-Differences Design**

 In order to estimate the effects of Seguro Popular on a sample of households, while minimizing the possibility of bias, I measure an intention to treat effect using a modified version of the traditional difference-in-difference estimator. For this modified difference-in-difference method, I follow two groups of families: those that are exposed to the program in 2004 and those exposed in either 2007, 2008 or 2009. With three rounds of data, each group serves as both treatment and control at different time periods. I also estimate two separate treatment effects: one for families that have been exposed for zero to two years and one for families that are exposed for five years. Figure 2 shows the total number of families affiliated to SP by year of eligibility. It demonstrates that very few families in the 2007-2009 treatment group were affiliated by 2009. For this reason, I expect the intention to treat coefficient for these families to be similar to that of the families treated and measured in 2004.

 In total, I follow a sample of 4,229 individuals over seven years, between 2002 and 2009. Of these, 3,473 became eligible for and enrolled in SP in 2004 and 756 became eligible and enrolled in the 2007-2009 period. Figure 3 shows administrative data on the number of families treated in the municipios studied here. While it does not show affiliation in my sample, it is suggestive that overall affiliation trends were the same in both groups. At the time of the 2002 survey, none of the households had yet become eligible for or enrolled in Seguro Popular. For this reason, I am able to detect the effects of SP on families relative to baseline characteristics measured in 2002. The following equation is estimated

$Y\_{ijt}=α+β\_{1}\left(T\_{04,i}\*Yr\_{09,t}\right)+β\_{2}\left(T\_{04,i}\*Yr\_{04,t}+T\_{07-09,i}\*Yr\_{09,t}\right)$ (3)

$$+β\_{3}T\_{04,i}+πX\_{ijt}+γ\_{i}+γ\_{j}+Yr\_{09,t}+Yr\_{04,t}+ε\_{ijt}$$

Where β₁ is the five year (or medium-term) treatment effect, β₂ is the short-term treatment effect and β3 is the effect of being in the group of families treated in 2004. The Xs are a vector of household characteristics, the γs are individual (or household) and municipio and fixed effects and the Yr variables are year fixed effects. I measure the effect of SP on several different outcomes, including utilization of health care services, spending on health care, health outcomes, both for individuals, children under 10, and households.

 This approach is similar to that followed by Miguel and Kremer (2004) in their study of the treatment effects of deworming medication. In their case, there was true random assignment at the school level, but students took deworming drugs voluntarily. In order to correct for the possible bias introduced when the students that choose deworming medication are different in type from those that do not, Miguel and Kremer compare the students that participate in the deworming program during the first phase of the study to those that choose to participate in the program when it is offered to them in a later phase. Because post-treatment data is also available for the 2007-09 cohort of families, I am able to depart from this strategy slightly and increase the size of my sample. Following (Autor 2006), I use the two treatment groups as controls for each other at different points in time. Between 2002 and 2004, the treatment status of families treated in 2007-09 remains unchanged, and so those families act as a control for the families treated in 2004.

**Selection**

 One of the key elements of the early phases of Seguro Popular is the targeting of beneficiaries by socio-economic status. In order to serve the neediest and most vulnerable first, state governments developed instruments to identify potential beneficiaries that were similar to those used by the Oportunidades program[[6]](#footnote-6). The goal was to give priority in affiliation to families in the lowest income quintile, to rural residents, and to indigenous populations. According to state estimates, income targeting has been near-perfect, with half of states reporting by 2005 that nearly 100% of their beneficiaries are in the lowest income quintile, and only 5 states reporting that less than 80% targeting. Overall, only 7% of beneficiaries had an income high enough to require them to contribute to the program (Scott (2006)).

These reports of near-perfect targeting appear to be in error, however. In their 2006 study of affiliated individuals and their communities, Gakidou and colleagues questioned these claims. Using the 2004 National Income and Expenditure Survey and the 2005 Census, they found that only 40% of affiliates were in the lowest income quintile, with 19% being in the lowest decile and 21% in the second lowest decile. Classifying municipios by levels of relative deprivation, they also found that 40% of affiliates lived in the second and third lowest deciles of deprivation, while only 15% lived in the lowest deprivation decile[[7]](#footnote-7). They also found that 50.1% of recipients lived in rural areas (23.5% of the population) and 9% were indigenous (6% of the population). However, controlling for wealth, rural residence, and community deprivation, they found that members of indigenous communities were less likely to affiliate (Gakidou et al. (2006)).

In order to test selection in to the Seguro Popular program, I use OLS to find the determinants of affiliation by 2009 on the total sample of families. The probability of enrolling in the program is believed to be a function of health status, health care consumption, status in Oportunidades, length of eligibility (status in the 2004 treated group), insurance coverage in 2002, income, and household demographics (Spenkuch 2011) (in this case, including indigenous status, sex, education, age, number of household members, number of children under 6). I believe selection occurs according to the following function:

*Pr(SPij=1 | Ej=1)=f(HealthCarei, Treated04j, Oportunidadesi, Demographicsi)* (4)

**Instrumental Variables Analysis**

Finally, some variables in ENCELURB survey are only available in the 2009 round, including use of preventive care and children’s educational attainment. In order to use these outcome variables in my study, I perform a two stage least squares analysis on my full sample of households, instrumenting for SP enrollment with the three strongest predictors of enrollment found in the analysis of selection. The following equations are estimated together:

*Pr(SPij=1) = α +βTreated04j + δ Oportunidadesi + γ Insurance02i + εij*(5)

$Y\_{ij}=α+β\_{1}\hat{SP\_{ij}}+β\_{2}X\_{ij}+u\_{ij}$ (6)

1. **Data**

 The analysis is performed on a 4,229 sample of families that gained access to the Seguro Popular program between 2004 and 2009. The families are drawn from the evaluation survey of the Oportunidades program (Encuesta de Evaluación de los Hogares Urbanos or ENCELURB). ENCELURB is a survey of 12,500 poor families in 17 Mexican states, including questions about health and health care utilization, employment, education, income, consumption, and demographic characteristics. The survey was conducted annually in 2002, 2003, and 2004 and again in 2009. To determine when individual municipalities, and thus the families living within them, became eligible for SP, this data set was combined with enrollment data obtained from the Seguro Popular Administration in Mexico City.

 Mean values of the characteristics of the 4,229 individuals in the sample are given in Table 2 along with their standard deviations. Families are divided into two groups: those that gained SP access in 2004 (3473), and those treated later, between 2007 and 2009 (756 individuals). Table2 contains baseline demographic characteristics and utilization measures from 2002, before both sets of families gained access. It shows that families that were treated in 2004 had significantly fewer health care visits in the month before the survey, reported fewer sick days in that same month, were slightly younger and poorer (measured by home size), all in 2002. They are also significantly more likely to be in the Oportunidades program in 2002, and have more members. There is no significant difference in the percent that are female or number of household members. While it is not ideal that there are several ways in which families in the two treatment groups differ, the differences do not suggest selection. Additionally, since difference-in-differences measures impacts by essentially looking at changes over time within groups, these differences are controlled for in the analysis below.

1. **Results**

**Health Care Utilization and Spending**

 To find the effect of Seguro Popular on health care consumption, I looked at the change in the probability of visiting a health care provider, both at the household and individual level, and at the number of such visits, all in the last month. Table 3 shows the short and medium-term effects of SP on the probability of a individual visiting a clinic or health center, a pharmacy, or a traditional healer for health care in the past four weeks. The effects were estimated following Equation 3 with dummy variable indicating use of services be someone in the household as the dependent variable with standard errors clustered at the household level. The effect of SP on the total usage of services is also included, in order to determine whether families are increasing their utilization of all health care services or only substituting between types health care services.[[8]](#footnote-8)

 Table 3 shows that clinic and total health care utilization is increased, especially in the period five years post treatment. Individuals are 5.5 percentage points (2002 mean is 7%) more likely to have visited a clinic in the past month and 6.3 percentage points (2002 mean is 11%) more likely to have had any health care visit in this period. Impacts on other types of visits are small and insignificant, with the exception of visits to private doctors immediately following the introduction of the program. The likelihood of visiting a private doctor increased by 1.85 percentage points immediately after introduction, but there was no detectable effect five years later. This result seems to be partially driving the increase in the likelihood of any type of health care visit in the period immediately following introduction, along with a positive but insignificant increase in clinic and pharmacy visits at this time.

Table 4, panel A, shows the effect of SP on health care utilization for children under 10. Again, I follow the specification in regression equation 3, estimating the effects with a linear probability model estimator. Impacts are similar to those for the full sample, but slightly larger for clinic and total usage. Children experience a smaller reduction in the use of low-quality services (pharmacies and traditional healers), however. Panel B shows the impact on adults over 50. These results are very small and insignificant, due in part to the small sample size. Table 5 shows the effect of SP on total health care visits in a month. Impacts are, again, similar to those found in Table 3 at the individual level, but their size and significance appear to be muted.

**Health Outcomes**

 With the increased consumption of health care services demonstrated above, it becomes relevant to ask whether affiliation with SP will lead to improved health status. In order to detect whether there is such an effect, I look at two measures of health status available in the ENCELURB survey. The first is a measure of self-reported illness, similar to measures of general health status used in many other studies. The families are asked to report the number of days that each family member was ill in the past month. This type of health measure suffers from subjectivity because each person's perception of her own health us dependent upon many factors, including the health status of their friends and family, and their own knowledge about health. Thus, increased exposure to the health care system, including increased visits to health care providers may change individual's perception of their own health status. This leads to the concern that self-reported measures of general health status, such as the one used in the ENCELURB survey may actually decline as an individual increases her health care utilization (Strauss and Thomas 1998).[[9]](#footnote-9)

 Another way in which to measure health status is by measuring the ability of individuals to perform the activities that they regularly perform. These activities of daily living (or ADLs) can be many different kinds of activities, and usually include work and household related tasks. In the ENCELURB survey, respondents were asked to report the number of days in the past month that each household member was unable to perform his or her normal activities, including going to work, helping with household tasks, caring for children, or going to school. This method of measuring health status can be less subjective than other measures, since the respondent can base their assessment of their own health on a clearer set of standards (Strauss et al. 1993).

 Table 6 shows the short and medium-term effects of Seguro Popular on these two measures of health status for the full sample, children under 10 and adults over 50. For both health measures, the effect of SP on the number of sick days experience in the past month is estimated following Equation 3. Standard errors are clustered at the household level. Table 6 no change in the number of self-reported sick days experienced in the past month for any group. The reported days of inability to perform daily tasks does drop for the full sample, however. This result holds both immediately after treatment and five years after program introduction, with the effect being slightly larger in the latter period. Five years post treatment, adults report 0.3 fewer days of being unable to perform usual tasks per month, nearly one-third less than the 2002 reported baseline of 0.97 days per month.

 **Selection**

 To determine factors that influence a family's decision to enroll in Seguro Popular, I estimated equation 4, regressing affiliation in SP on the 2002 and 2009 characteristics of all of the individuals in my sample, including the length of time they were eligible for the program (proxied by their inclusion in the group that was offered SP in 2004). All of the households in the sample were poor, uninsured, not employed in the formal sector (and thus not eligible IMSS), and either eligible for Oportunidades, or right above the income cutoff for that program. Since the only firm criteria for affiliation with SP is a lack of formal social security benefits, all of these families were eligible for SP as soon as it was offered in their municipio.

 Equation 4 was estimated with a linear probability model with municipio fixed effects and standard errors clustered at the household level. The estimated coefficients are shown in the first column of Table 7. The demographic factors that positively and significantly affected SP enrollment are sex, indigenous status, education, household size, number of children under 6 in the household[[10]](#footnote-10). Other important factors are length of eligibility for the program, access to health insurance in 2002, employment in 2002, and enrollment in the Oportunidades program in 2009. In an attempt to detect adverse selection, I measure the impact of the number of clinic visits and household medical spending in 2002. The number of clinic visits does positively impact affiliation, suggesting negative selection into the program. However, spending does not have an impact. Interestingly, Oportunidades beneficiaries, while technically eligible for SP automatically, are a little over 20 percentage points more likely to enroll in SP than non-beneficiaries. Another interesting result is that families that identify as members of indigenous groups are 3.8 percentage points less likely to enroll in SP than those that do not so identify. In this population, at least, the SP administration was not effectively targeting the program to the indigenous. The second column of Table 7 performs the estimation only for those admitted to the program in 2004. Results are similar. Finally, the third column of Table 7 shows a model of selection containing only length of exposure to SP, access to Oportunidades, insurance in 2002, and household size. These are the instruments used for predicting SP enrollment in the two stage least squares analysis that follows. The reported F-stat for this regression is 83.89, well above the threshold of 10 that is often used as a rule of thumb for judging whether instruments are weak.

 **Preventive Care (Instrumental Variables Analysis)**

 Table 8 shows the two stage least squares estimate of SP affiliation on the likelihood of accessing preventive health care in the previous year, measured in 2009. When measured in the full sample of individuals, SP increases these visits by over 15 percentage points. When effects are broken down by age and sex, however, it is clear that the bulk of the effect is being driven by mails who are almost 17 percentage points more likely to obtain preventive care when enrolled in SP. This is not surprising when viewed in the full context of the Mexican social safety net, which has grown considerably in the last few decades to offer many ways for children and women of child-bearing age to access health care services. There is also a large but insignificant effect for those over 60, but the sample size here is quite small.

**Income and Employment Effects**

 Returning to the difference in differences analysis, Table 9 shows that total household spending for affiliated families drops by approximately 82 pesos per month five years after program introduction, about 150% of the daily minimum wage in 2009). This is consistent with other findings of decreases in household medical spending due to the program. Table 10 reports the effect of SP affiliation onthe probability of being employed at all, the hours worked in the past week, and the weeks worked in the past year. Coefficients are estimated for six groups: the full sample of those over 10, adults over 50, males, females, household heads, and non-heads. By all three measures, affiliated adults work less one year post treatment. These results hold for the full sample, men, women, and household heads, most significantly. This result may be due to workers shifting between the formal and informal sector during this period (although only 2 percent of the sample are in the formal sector, this accounts for roughly 10 percent of the employed). Five years later, however, workers seem to be back to their previous employment pattern and none of the estimated coefficients are significant, with the exception of a small decline in weeks worked in the full sample.

**Conclusion**

 This paper presents the first estimates of the effect of Mexico's Seguro Popular program on a multi-year panel of individual level data over a period of five years. I find a significant increase in the probability of individuals utilizing health care services, and a significant increase in the number of times these services are used, especially public clinics. I also find an increase in the likelihood of a preventative health visit. These results are in opposition to previous short term studies of Seguro Popular that find no change in utilization and a decrease in preventative visits. Interestingly, the result seems to be driven by adult males, likely due to the availability of other sources of preventative care to women and children under Oportunidades. Perhaps directly due to increases in utilization, I observe a decrease in the number of days individuals report being unable to perform their daily duties, considered a relatively non-subjective measure of health.

I find a decrease in health care spending for families enrolled in the Seguro Popular program, consistent with previous studies. This is likely not driving the decrease in labor force participation of affiliates, however, since by five years post-affiliation employment seems to have returned to pre-Seguro Popular levels.

 Over all, there is some evidence that Seguro Popular is acting as more than an income transfer and may improve population health in the long run. Future work should look for evidence of these long term effects and include an analysis of educational attainment and school enrollment for teenagers as well as an investigation into the impact of the program on fertility choices, especially those of teens and young women.

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1. **Figures and Tables**

Figure 1 – Total Affiliated Families by Year (Source: Mexican Administrative Data)



Source: Seguro Popular administrative data. In 2002 and 2003, SP operated as a pilot program and 614,000 families were affiliated. The number of affiliated families rose to 1.7 million by the end of 2004; and by September of 2006, 4 million families were enrolled (Knaul et al. 2006). By 2013, 24 million families, or 52 million people, were affiliated (Knaul et al. 2012).

Figure 2 – Total Affiliated Families by Year of Eligibility (Source: Mexican Administrative Data)



Figure 3 – Total Affiliated Families by Year of Affiliation in Studied Municipalities

(Source: Mexican Administrative Data and Author’s Calculations)



Table 1 – Affiliated Municipalities by Year of Affiliation (All of Mexico)

(Source: Mexican Administrative Data)



Table 2 – Summary Statistics by Treatment Group



Table 3 – Effect of Seguro Popular on Likelihood of a Health Visits in the Past Month (Full Sample)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|   | **Hospital** | **Clinic** | **Private Doctor** | **Pharmacy** | **Nurse**  | **Traditional** | **Total** |
| One Year Post Treat | -0.00795 | 0.0259 | 0.0185\*\* | 0.0115 | -0.00289 | -0.00279 | 0.0503\*\* |
|  | [0.0121] | [0.0196] | [0.00925] | [0.0109] | [0.00177] | [0.00356] | [0.0224] |
| Five Year Post Treat | -0.0187 | 0.0554\*\* | 0.00512 | 0.0049 | -0.00212\*\* | -0.00308 | 0.0629\*\* |
|   | [0.0128] | [0.0259] | [0.0107] | [0.0115] | [0.00107] | [0.00354] | [0.0287] |
| Observations | 4229 |   |   |   |   |   |   |
| Robust standard errors in brackets |  |  |  |  |  |  |
| \*\*\*p<0.01, \*\*p<0.05, \*p<0.1 |  |  |  |  |  |  |

Table 4 – Effect of Seguro Popular on Likelihood of a Health Visit for Children Under 10 and Adults Over 50 in the Past Month

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| **Panel A: Children Under 10** |
|   | **Hospital** | **Clinic** | **Private Doctor** | **Pharmacy** | **Nurse**  | **Traditional** | **Total** |
| One Year Post Treat | -0.00941 | 0.0337 | 0.0351\*\*\* | 0.0176 | -0.00528 | -0.00118 | 0.0843\*\* |
|  | [0.0162] | [0.0325] | [0.0135] | [0.0199] | [0.00381] | [0.00598] | [0.0365] |
| Five Year Post Treat | -0.0167 | 0.0876\*\* | 0.0209 | 0.0118 | -0.00209 | -0.00181 | 0.119\*\*\* |
|   | [0.0187] | [0.0384] | [0.0161] | [0.0199] | [0.00207] | [0.00594] | [0.0422] |
| Observations | 1,835 | 1,835 | 1,835 | 1,835 | 1,835 |  1,835 | 1,835 |
| **Panel B: Adults Over 50** |
|   | **Hospital** | **Clinic** | **Private Doctor** | **Pharmacy** | **Nurse**  | **Traditional** | **Total** |
| One Year Post Treat | -0.0438 | -0.0764 | 0.0263 | -0.00217 | -0.00343 | -0.00335 | -0.0502 |
|  | [0.0322] | [0.0701] | [0.0327] | [0.0388] | [0.00345] | [0.00340] | [0.0836] |
| Five Year Post Treat | -0.0178 | 0.0316 | 0.0379 | 0.00848 | -0.00355 | -0.00341 | 0.0806 |
|   | [0.0360] | [0.0761] | [0.0343] | [0.0346] | [0.00356] | [0.00345] | [0.0880] |
| Observations | 347 | 347 | 347 | 347 | 347 | 347  | 347 |
| Robust standard errors in brackets |  |  |  |  |  |  |
| \*\*\*p<0.01, \*\*p<0.05,\*p<0.1 |  |  |  |  |  |  |

Table 5 – Effect of Seguro Popular on Total Number of Health Visits in the Past Month (Full Sample)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|   | **Hospital** | **Clinic** | **Private Doctor** | **Pharmacy** | **Nurse**  | **Traditional** | **Total** |
| One Year Post Treat | -0.00308 | 0.0412 | 0.0280\*\* | 0.0139 | -0.00533\* | -0.00334 | 0.0743\* |
|  | [0.0159] | [0.0333] | [0.0142] | [0.0173] | [0.00297] | [0.00420] | [0.0388] |
| Five Year Post Treat | -0.0236 | 0.0839\*\* | 0.0174 | 0.0031 | -0.00452\* | -0.00615 | 0.0937\*\* |
|   | [0.0198] | [0.0375] | [0.0164] | [0.0179] | [0.00259] | [0.00458] | [0.0438] |
| Observations | 4,229 | 4,229 | 4,229 | 4,229 | 4,229 | 4,229 | 4,229 |
| Robust standard errors in brackets |  |  |  |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |  |  |  |  |  |  |

Table 6 – Impact of Seguro Popular on Health Status in the Past Month



Table 7 – Determinants of Entry into the Seguro Popular Program



Table 8 – Impact of Seguro Popular on Preventive Health Care Visits in Past Month for Full Sample

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **A: Full Sample** | **B: Under 21** | **C: Over 50** | **D: Female** | **E: Male** |
| SP Coverage | 0.154\*\* | 0.0195 | 0.216 | 0.0667 | 0.168\*\* |
|  | [0.0737] | [0.0984] | [0.200] | [0.0976] | [0.0784] |
| Observations | 11,749 | 5,033 | 793 | 6,061 | 5,688 |
| Robust standard errors in brackets |  |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |  |  |  |  |

Table 9 – Effect on Household Medical Spending



Table 10 – Impact of Seguro Popular on Employment for Adults 10 and Over

|  |  |  |
| --- | --- | --- |
|   | **A: Full Sample** | **B: Over 50** |
|   | **Employed** | **Hours Worked** | **Weeks Worked** | **Employed** | **Hours Worked** | **Weeks Worked** |
| One Year Post Treat | -0.0475\*\* | -3.344\*\* | -4.975\*\*\* | -0.00342 | -1.056 | 1.463 |
|  | [0.0224] | [1.478] | [1.471] | [0.0661] | [4.866] | [3.165] |
| Five Year Post Treat | -0.0228 | 0.895 | -3.505\*\* | 0.076 | 2.463 | 3.925 |
|   | [0.0256] | [1.608] | [1.674] | [0.0735] | [4.437] | [3.652] |
| Observations | 2,394 | 2,394 | 2,394 | 347 | 347 | 347 |
|  | **C: Males** | **D: Females** |
|   | **Employed** | **Hours Worked** | **Weeks Worked** | **Employed** | **Hours Worked** | **Weeks Worked** |
| One Year Post Treat | -0.0362 | -5.005\* | -4.987\* | -0.0541\* | -2.309 | -4.821\*\*\* |
|  | [0.0331] | [2.977] | [3.002] | [0.0303] | [1.572] | [1.558] |
| Five Year Post Treat | -0.00919 | 2.246 | -4.365 | -0.0272 | 0.598 | -2.635 |
|   | [0.0414] | [3.174] | [3.215] | [0.0341] | [1.669] | [1.851] |
| Observations | 926 | 926 | 926 | 1,468 | 1,468 | 1,468 |
|  | **E: HH Heads** | **F: Non-HH Heads** |
|   | **Employed** | **Hours Worked** | **Weeks Worked** | **Employed** | **Hours Worked** | **Weeks Worked** |
| One Year Post Treat | -0.0575 | -6.133\*\* | -6.730\*\* | -0.0364 | -1.408 | -3.377\*\* |
|  | [0.0355] | [3.073] | [3.156] | [0.0290] | [1.512] | [1.392] |
| Five Year Post Treat | -0.0189 | 2.08 | -4.81 | -0.0301 | -0.219 | -2.497 |
|   | [0.0408] | [3.248] | [3.490] | [0.0336] | [1.596] | [1.619] |
| Observations | 1,125 | 1,125 | 1,125 | 1,577 | 1,577 | 1,577 |
| Robust standard errors in brackets |  |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 |  |  |  |  |  |

1. First draft: October 2014. Contact information: Melissa Knox, Department of Economics, University of Washington, Box 353330, Seattle, WA 98195. Email: knoxm@uw.edu [↑](#footnote-ref-1)
2. Here I am following the terminology of Aguilar (2012). Gertler, Martinez and Rubio-Codina (2012) call it the long term. Due to the impacts of childhood health being life-long, it seems that some program impacts may not appear for several more years into the future. [↑](#footnote-ref-2)
3. These services are part of a bundle of services, which also includes life insurance, disability pensions, work-risk pensions, retirement pensions, sports and cultural facilities, day care, and housing loans. The services are paid for through payroll taxes and government financing and are not optional. Similar services are available to public employess through ISSTE. [↑](#footnote-ref-3)
4. Since states receive federal funding for every affiliated family, they have a strong incentive to affiliate their entire population. [↑](#footnote-ref-4)
5. By 2012, the catalog included 284 interventions and 312 medications, covering over 95% of Mexico's disease burden (Knaul et al. 2012). [↑](#footnote-ref-5)
6. In 2004, officials decided to automatically affiliate all Oportunidades beneficiaries with Seguro Popular, but in most cases the beneficiaries were unaware of this (Gakidou 2008). This appears to be born out in the sample of households used in this paper, where Oportunidades recipients are only 20% more likely to say that they are affiliated with Seguro Popular than non-recipients. [↑](#footnote-ref-6)
7. This is not surprising, considering that Seguro Popular was initially rolled out in areas that had well-developed health facilities. [↑](#footnote-ref-7)
8. Included in the "Total" variable, but not reported separately, are visits to private doctors, visits to private nurses, and out-patient hospital visits. [↑](#footnote-ref-8)
9. Although it should be noted that Gertler (2004) found significant improvement in child health due to the PROGRESA program using exactly the same measure used in the current study. [↑](#footnote-ref-9)
10. This coefficient is somewhat surprisingly negative. Perhaps it is so because households with many children are already receiving alternative health services. [↑](#footnote-ref-10)