Health Insurance for All: An Evaluation of Mexico's Seguro Popular Program

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Abstract

This paper evaluates the effects of Seguro Popular on household and individual level health-related consumption, health spending, health outcomes, and labor supply. First introduced in 2002, Seguro Popular provides free health care to the fifty percent of Mexican families that lack the social security protections granted to all formal sector workers in that country. The Seguro Popular program was introduced in stages, across municipalities and time. I exploit this variation and implement a modified difference-in-difference analysis to evaluate the effects of the program on a panel of households between 2002 and 2004. I find significant increases in health care utilization, especially for children, but little change in spending or health outcomes. Labor supply decreased overall for secondary workers, especially young males, but older adults see a significant increase in hours worked.

1 Introduction

This paper evaluates the effects of Mexico's *Seguro Popular* program on health care utilization, health outcomes, and labor market participation for a group of poor, urban families. *Seguro Popular*, or "People's Insurance", is a major health system reform introduced in 2002 with plans for expansion through 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. My analysis spans the years 2002 through 2004. Although this is the early period of the program, I find increases in utilization of medical care, and some changes in labor force participation. No effect were found on spending or health outcomes.

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.[1] 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, the debate has centered around extending 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.[2] 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 Conver (2008) found that the *Régimen Subsidiado* program had a positive and significant impact on infant birthweights, but they could not find evidence of a significant effect of the program on health access or other health outcomes.

The introduction of Mexico's Seguro Popular program (SP) in 2002 provides an opportunity to gather more evidence of the effects of social health insurance programs on health care access, health, and labor force participation in the developing country context. Understanding the impact of SP on these individual-level outcomes, especially by age and sex, is important for policy makers in all nations considering implementing similar programs. Early research into the effects of SP has found that SP affiliates experience an increase in utilization of health care services, a movement away from using private medical services, and a decrease in health care spending, but little effect on health outcomes (Gakidou et al. (2006), Sosa-Rubi et al. (2007), Barros (2008)). These studies, however, have not completely accounted for selection into the *Seguro Popular* program. Gakidou and coauthors (2006) compare the health-related behaviors of *Seguro Popular* affiliates to those of non-affiliates, controlling for household characteristics, but not for unmeasured characteristics that may have driven households' selection into the program, while Barros (2008) compares average health care consumption in 2000 to that of enrolled families with similar characteristics in 2006. Finally, Sosa-Rubi and coauthors look at the effects of the SP program on women's choice of obstetrical providers. All three of these studies use Mexico's National Health Surveys (ENSA and ENSANUT). Conducted in 2000 and 2006, these surveys are repeated cross-sections of individuals, making it impossible to

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[1] Recent studies have found a causal impact of improvements in health on increasing labor force participation (Strauss and Thomas (1998), Thomas et al. (2004)), providing further economic justification for social health insurance programs.

[2] Currie and Gruber (1996) and Card et al.(2004) found increased health care utilization and improved health as a result of the Medicaid and Medicare programs in the U.S., respectively.

completely control for unobserved household characteristics that may determine selection into the program.

In this paper, I attempt to correct for these selection issues by following a sample of 819 families (and 3,491 individual family members) over three years, 2002, 2003, and 2004. This panel of households, drawn from the *Encuesta de Evaluación de los Hogares Urbanos* data set, is surveyed about their health care utilization, household consumption, health status, and employment before and after enrolling in the *Seguro Popular* program. Following households over time allows me to control for time invariant household characteristics that are otherwise unmeasurable. I also exploit the time-varying entry of states and municipalities into the program to create a modified version of the traditional difference-in-difference estimator. I divide the households in the sample into two groups of households: those that are eligible to enter the program at the end of 2002 and in 2003, and those that are eligible to enter the program in 2004. Each group of households serves as a control for the other, and I am able to measure the effects of *Seguro Popular* on health care-related consumption, employment decisions, and health outcomes for all of the families in my sample. I also break down my analysis by age and sex for certain variables, providing a first glimpse into the differential effects of SP.

My findings are consistent with previous research. Families that receive *Seguro Popular* increase their health care utilization, especially in the area of health center visits and hospitalization, and decrease their usage of private care providers such as private doctors and pharmacies. The largest increases are for children under 10, while adults over 55 see a much smaller and insignificant increase in utilization. While I do not find an effect of *Seguro Popular* on family health care spending or health outcomes, there is a small, but significant increase in self-reported illness for women, especially those 31 and 55. I do not find any impact of SP on labor force participation among household heads, but secondary workers in households receiving SP significantly decrease their hours worked per week. Breaking the sample down further, I find that males aged 15 to 24 are significantly less likely to be employed when enrolled in SP, while workers between 45 and 65 significantly increase the number of weeks they work in a year.

To test the validity of the modified difference-in-difference technique used in the main portion of the paper, I also perform a traditional difference-in-difference (d-in-d) analysis and compare the estimated results to my main results. I find that the traditional d-in-d estimator is able to approximate the results found by my modified estimator in the area of health care utilization and spending, but it distorts the effect of SP on employment. Finally, to confirm that my results are true treatment effects and not being driven by some unmeasured variable that is driving both health care choices and SP eligibility, I test my results for the sample of individuals and households that are eligible for, but do not adopt, SP. These results are small, insignificant, and often in the opposite direction from the treatment effects measured in the rest of the paper.

The organization of this paper is as follows: Section 2 gives an explanation of Mexico's formal social security system and gives a detailed description of

the *Seguro Popular* program. Section 3 describes my empirical methodology, including the difference-in-difference methodology used to measure the effects of the program, and the reasoning behind the selection of my comparison sample. Section 4 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 5 describes the determinants of selection into the *Seguro Popular* program, and the results of my difference-in-difference analysis, and Section 6 concludes and suggests avenues for further research.

2 Background

2.1 A Segmented System

Mexico's segmented health care system dates back to 1943, when both the Ministry of Health (SSA) and the Mexican Institute for Social Security (IMSS) were created. Under this system, workers in the private formal employment sector, as well as their families, were entitled to receive services for little to no cost in facilities run by IMSS,[3] while the self-employed, the unemployed, and those employed in the informal sector were only entitled to services from the Ministry of Health.[4] 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 7% and 3% were covered by ISSSTE and private insurance, respectively. 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)).

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[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.<

[4] Public sector employees and their families are covered by the Institute of Social Security and Services for Civil Servants (ISSSTE), which is similar to IMSS.

2.2 Structural Reform

In April 2003, Mexico's General Health Law was reformed. The reform, which went into effect January 1, 2004, was designed 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). Eventually, the government intends to increase public spending on health by 1% of GDP (Gakidou et al. (2006)).

Because it is such an ambitious and expensive project, *Seguro Popular* has been implemented 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. 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)).

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). In 2002, 342 *municipios* participated in SP, 524 participated in 2003, 946 in 2004, and 1600 by the end of 2005 (Knaul et al. (2006)).

2.3 Affiliation

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.[5] The actual work of affiliating families is left to the

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[5] Since states receive federal funding for every affiliated family, they have a strong incentive to affiliate their entire population.

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)).

2.4 Finance

Responsibility for the financing of the *Seguro Popular* program is shared between the federal government, the states, and beneficiary families. The federal government's contribution comes in two parts. First, they make a "social contribution", which is equal for all families and periodically adjusted for inflation. This part of the government's contribution is intended to ensure equal allocation of federal resources for all families. The second part of the federal contribution is the "co-responsible contribution", which is intended to redistribute resources between states. On average, it is 1.5 times the social contribution, but is higher in poorer states and lower in wealthier states (Frenk et al. (2006)). These federal level contributions mean that non-social security public health expenditure increased from 0.84% of GDP in 2000, to 1.13% of GDP in 2005. Additionally, there has been some improvement in inequality across states. The across-state Gini coefficient of federal non-social security health expenditure fell from 0.29 to 0.26 in the same period (Gakidou et al. (2006)).

The state and family level contributions are much lower. Each state is committed to contributing an equal amount for every affiliated family. Their contribution is set at half the amount of the federal social contribution. This is funded by state-level revenue. Finally, the amount of the family-level contribution is determined on a sliding scale. Families are placed into income deciles, with disposable income defined as is total household spending net of spending on food. Families in the lowest two income deciles are not expected to contribute at all, and families in higher income deciles pay a fixed proportion of disposable income, with an upper limit of 5% (Frenk et al. (2006)).

2.5 Targeting

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 which were similar to those used by the Oportunidades program.[6]

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[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

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<footnote>This is not surprising, considering that *Seguro Popular* was initially rolled out in areas that had well-developed health facilities.</footnote>. 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)).

2.6 Benefits

Once a family chooses to enroll in the program, there is a 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)).[7] 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

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recipients are only 8% more likely to say that they are affiliated with Seguro Popular than non-recipients.

[7]By 2007, the catalog included 266 interventions and 312 medications, covering over 95% of Mexico's disease burden (Seguro Popular 2007).

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.[8]

2.7   Model

To predict the effects of *Seguro Popular* enrollment on household health care consumption, I employ a simple model of utility maximization by a representative household. The household's utility function is

$$U(H_{sp}, H_o, C) \tag{1}$$

where H_{sp} is the household's consumption of medical services available from public facilities such as the SSA and later *Seguro Popular*, H_o is the household's consumption of outside health care services (such as those received from pharmacies, traditional healers, or other private providers), and C is the household's consumption of non-health-related goods. The household's budget constraint is then

$$p_{sp}H_{sp} + p_oH_o + C = m \tag{2}$$

where p_{sp} and p_o are the prices of services at public facilities and outside facilities, respectively, while m is the household's total income. Since enrollment in SP is free for nearly all families (Scott (2006)), the main effect of the introduction of SP to enrolled households is a lowering of the price p_{sp}. While most services offered to SP enrolled families are free, I include time and transportation costs into the price of SP services, so that p_{sp} is always greater than zero.

In response to the lowering of p_{sp}, households will change their health care consumption in two ways. First, they will substitute health care consumption in SP facilities for health care consumption in outside facilities. 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 less health care from the types of private facilities listed above. The other way that families will respond to the price decrease is through an income effect. Once health care becomes less expensive for these families, I expect to see them consuming more services, especially at the public facilities covered under the SP program.

Other detectable effects of a change in health care consumption are changes in health outcomes, and changes in labor market behavior. If families increase the amount of health care they consume, it is possible but not guaranteed that I will detect changes in health outcomes. Another way of detecting changes in health status is through changes in labor market behavior. Individuals may increase their labor market participation if they become healthier (Strauss &

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[8]While birth in a SSA facility commonly costs up to 700 pesos, a large sum for poor families, SP beneficiaries are able to give birth for free (Gakidou (2008)).

Thomas (1998)). Alternatively, changes in labor supply may be due to an income effect. If families are saving money on their health care needs, the family's income requirements are decreased, and there is less incentive for household members work.

3   Empirical Methodology

3.1   Effects of the Program

In order to estimate the effects of *Seguro Popular* on a sample of households, while minimizing the possibility of bias, I employ a modified version of the traditional difference-in-difference estimator. For this modified difference-in-difference method, I choose to follow only those families that enroll in the program when it is first offered to them. I exploit the geographic variation in the introduction of *Seguro Popular* to compare families that choose to enroll in SP in 2002 and 2003 when it is first made available in their municipalities, to families that reside in municipalities that only become eligible for the program in 2004 and choose to enroll in SP then.

In total, I follow a sample of 819 households over three years, between 2002 and 2004. Of these households, 425 became eligible for *Seguro Popular* at the end of 2002, and reported being enrolled in the program in the 2003 survey, 206 households became eligible for and reported enrolling in SP in 2003, and the final 188 households became eligible for and enrolled in SP in 2004. At the time of the 2002 survey, none of the households had yet become eligible for or enrolled in *Seguro Popular* (which happened in the fourth quarter of that year), 630 families reported being enrolled in *Seguro Popular* in the 2003 survey, and all 819 families reported being enrolled in the program in 2004. By following all 819 of these households for the next two years, I am able to detect the effects of their health care consumption and health outcomes relative to baseline characteristics measured in 2002. The following equation is estimated

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\begin{aligned}
Y_{ijt} \quad = \quad & \alpha + \beta_1(T_{02-03,i} * Yr_{03,y} + T_{02-03,i} * Yr_{04,t} + T_{04,i} * Yr_{04,t}) \quad (3) \\
& + \beta_2 T_{02-03,i} + \Pi X_{ijt} + \eta_i + \gamma_j + Yr_{03,t} + Yr_{04,t} + \varepsilon_{ijt}
\end{aligned}
$$

Where β_1 is the treatment effect, β_2 is the 2002/2003 treatment group effect[9], the Xs are a vector of household characteristics, the ηs are household random effects, and the γs are *municipio* and 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, and labor force participation.

This approach is similar to that followed by Miguel & 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

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[9]The treatment group effect for families treated in 2004 is omitted to avoid multicollinearity.

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 outcome data is also available for the 2004 cohort of families, I am able to depart from this strategy slightly and increase the size of my sample. Following Autor *et al.* (2006), I use the two treatment groups as controls for each other at different points in time. Between 2002 and 2003, the treatment status of families treated in 2004 remains unchanged, and so those families act as a control for the families treated in 2002 and 2003. Conversely, this latter group of families is able to act as a control sample between 2003 and 2004 while their treatment status stays constant.

3.2 Selection

In order to test selection in to the *Seguro Popular* program, I compare 819 families which chose to affiliate with the program when it was first offered to them with 3,680 eligible families in the same municipalities that did not choose to enroll in the program by the end of the time period studied. The comparison families were chosen based on their eligibility for the *Seguro Popular* program. The probability of enrolling in the program is believed to be a function of health status, health care consumption, income, and household demographics (including indigenous status, number of household members, number of children under 6, number of females between 15 and 49, and whether the household is female-headed).

$$P(SP_{ij} = 1 | E_j = 1) = f(Health_i, HealthCare_i, Demographics_i, T_j) \quad (4)$$

Where the ηs are *municipio* fixed effects, and ε is a mean-zero normal error term. The dummy variable E_j indicates whether *municipio* j is eligible for *Seguro Popular* by the end of 2004 (the end of available data).

4 Data

The analysis is performed on an 819 household (3,491 individual) sample of families which chose to enroll in the *Seguro Popular* program between 2002 and 2004. 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, income, consumption, and demographic characteristics. The survey was conducted annually in 2002, 2003, and 2004. 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 819 families and 3,491 individuals in the sample are given in Tables (1), (2), and (3) along with their standard deviations. Families are divided into two groups: those that were treated earlier in the program, in 2002 and 2003, and those treated later, in 2004. Table (1) contains baseline demographic and employment characteristics for the treated families. It shows that families that were treated in 2004 are significantly less likely to be from an indigenous group, have a household head with less education, and are less likely to be headed by a female. 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 of household members that are female, the number of women between 15 and 49, or the number of children under 6. There is also no significant difference in employment or income between families in the two treatment groups. While it is not ideal that there are several ways in which families in the two treatment groups differ, it is not clear from these differences that one group is richer or than the other, or likely to experience different trends in health or employment. In some ways (e.g. education, indigenous status), the families treated in 2004 appear to be better off than those treated in 2003. In other ways, however, they appear to be poorer (e.g. Oportunidades enrollment, family size). Additionally, these differences are controlled for in the analysis below.

The 2002 means of health care utilization, health care spending, and health status for the two groups of families are given in Table (2), along with their standard deviations, while the same data is shown for individuals in Table (3). Unlike the demographic characteristics, health care consumption is similar for the two groups. Families treated in 2004 had significantly fewer clinic visits and total health care visits in the month before the survey was taken, but they are just as likely to have visited a clinic, a private doctor, or a pharmacy as the families treated in 2002 and 2003. They are also just as likely to have been admitted to the hospital in the last year, spent the same number of days in the hospital, spent the same amount on medicines, hospital visits, and total health expenses, and suffered just as many sick days as the latter group. At the individual level, the total number of health visits in the past month, as well as the total number of days in the hospital in the past year differ significantly. All other variables are not significantly different from each other. This similarity in the baseline health care consumption variables indicates that the two groups of families have similar demands for health care before they are enrolled in SP, and supports my conclusion that measured differences after treatment are due to the program.

To further bolster my claim that trends are similar for the treatment groups, I also look at the characteristics of the municipalities that were treated. Figure (1) shows the poverty head count ratio for each of the treated municipalities in the ENCELURB sample, by treatment year. The figure shows that the distribution of poverty levels is similar for the three groups of cities. An analysis of the mean poverty head count ratio in each treatment year group shows that there is no significant difference between the three groups, at the 5% level.

5 Results

5.1 Graphical Evidence

As a preliminary measure of the success of *Seguro Popular*, I graph the mean values of a selection of outcomes by treatment group. Figure (2) and Figure (3) show the probability of health clinic usage and the number of health clinic visits by clinic users for sample households between 2002 and 2004, respectively These figures show a steady increase in clinic utilization for early adopters, and an increase in utilization for late adopters after adoption. This result is consistent with the goal of SP, which provides free health care in state-sponsored health clinics. Conversely, Figures (4) and (5) show attendance at pharmacy-based health clinics by SP enrollees, both probability of utilization and times used. Again, this result is not surprising given that doctors in pharmacy clinics are private physicians and not covered under the SP program.

Since health care utilization appears to increase, I then investigate changes in health outcomes due to SP. Figures (6) and (7) show the average trend for treated households in the two measure of health care reported in the ENCELURB survey. Figure (6) shows the change in the respondents response to a question about the number of days they felt sick or had health problems in the past month. This self-reported measure of health appears to decline over time for treated individuals. Figure (7) shows trends in a slightly different measure of health status. This outcome is a measure of the number of days in the past month that each respondent is unable to perform their usual activities due to illness. This indicator of activities of daily living (ADLs) also appears to decrease over time for treated individuals.[10]

Finally, I present some graphical evidence of the effect of SP on individual employment. Figure (8) shows the probability of employment for adults 15 to 65 over time for treated households. This figure shows an upward trend in employment for all treated adults, indicating that SP may possibly have a positive effect on employment, possibly through improved health status for beneficiaries.

5.2 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, at the number of such visits, at the probability of being hospitalized, and at the number of days spent in the hospital. Panel 1 of Table (4) shows the effect of SP on the probability of a household member visiting hospital, a clinic or health center, or a pharmacy for health care in the past four weeks. The effects were estimated following regression (3) with dummy variable indicating use of services be someone in the household as the dependent variable with standard errors clustered at the *municipio* level. The effect of SP on the total usage of services is also included, in order to determine whether families

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[10]Both of these measures of health status are explained more fully in section 5.3.

are increasing their utilization of all health care services or only substituting between types health care services [11] Table (4) shows that the introduction of SP has a positive and significant effect on the use of clinic services. Households experience an increase of nearly 67 percent over their untreated probability of visiting a clinic in the past month. SP also has a positive and significant effect on the total usage of health care services, which indicates that families that receive SP increase their overall usage of health care by nearly 35 percent, an increase of over 11 percentage points. A negative but insignificant effect of SP on both the use of pharmacy consults is consistent with the theory that families without health insurance will seek out private care rather than use SSA services.[12] The second panel of Table (4) shows the effect of SP on the number of times a household member used these services in the past four weeks. Again, I follow the specification in regression equation (3), estimating the effects with a Tobit estimator. Following Guan (2003), I bootstrap my standard errors as a substitute for clustering them at the *municipio* level The results in Table (4) indicate that clinic usage and total usage are the only behaviors significantly affected by SP. Families with SP increase their clinic usage by 134 percent, seeking 1.41 more visits than those without, and families with SP increase their total number of health visits by nearly 1 visit per month, or 77.5 percent, over families without SP.

Table (5) shows the effect of SP on health care visits for individuals. The effect of SP on the probability of using services is estimated using a linear probability model with standard errors clustered at the household level, while the effect of SP on the number of health care visits is again estimated with a Tobit model and bootstrapped standard errors. Similar to the household level results discussed above, there is a significant increase in clinic visits and total health care visits for individuals. Individuals with SP are 42 percent more likely to have visited a clinic, and 34 percent more likely to have visited any kind of health care provider in the past month. Additionally, SP has a small but significant effect on pharmacy consults, decreasing the probability of their usage by a little less than 1 percentage point, or 55 percent. The bottom panel of Table (5) gives the effect of SP on the number of times each service was used in the past month. In the individual case, both hospitals and clinics were used significantly more by people with SP, nearly 1 time more per month; while pharmacy consults were used 1 time less per month. Total health care usage increased significantly, again by nearly 1 visit per month.

To further understand the measured increase in health care visits, I looked at the change in clinic usage and total health care usage by age group. Table (6) shows this change for individuals under 10, individuals between 10 and 30, individuals between 31 and 55, and individuals over 55. The increase in clinic usage is the largest for children under 10, with an 8.7 percentage point increase in their probability of visiting a clinic and a increase of an average of one visit per

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[11] Included in the "Total" variable, but not reported separately, are visits to private doctors, visits to private nurses, and visits to traditional healers.

[12] The effect of SP on the use of private doctors is not reported here, but the estimated coefficient is also negative and insignificant.

month. Adults over 55 saw the smallest increase in clinic visits, and the results for this group were insignificant. The results for the middle two age groups are similar to the total effects reported in Table (5). The increase in total health care consumption was more uniform across age groups, with only the 10 to30 age group seeing an increase in probability of usage of less than 5 percentage points. Again, the results for those over 55 are not significant, probably due to the relatively small number of household member in that age group.

Table (7) shows the effect of *Seguro Popular* on several household level variables. Included in the table are hospitalizations in the past year, the number of days spent in the hospital, and the amount spent on hospitalizations, as well as the amount spent on medications and total household medical spending in the past month. The first column displays the results of regression (3) where the dependent variable is a dummy variable indicating whether the household has had a member hospitalized in the past year. It is estimated using a linear probability model with standard errors clustered at the household level. The second column is the result of the regression of total number of days in the hospital per household on the presence of SP. Again I follow regression (3), and estimate the coefficient using a Tobit specification with bootstrapped standard errors. Table (7) shows that families with SP are 7 percentage points more likely to have a member be hospitalized in the past year, an increase of 26 percent over their baseline probability, and those hospitalizations last nearly 3 days longer on average, or 12 times longer than before treatment. Both of these results are significantly different than zero.

One of the goals of *Seguro Popular* is to decrease medical spending for poor families, especially in the area of medicines and large expenses such as hospitalizations. Table (7) also gives the effect of *Seguro Popular* on household level medical spending in pesos. The effect of SP on monthly spending on medications and total health services, as well as yearly spending on hospitalizations, are estimated with a Tobit model, using the specification in regression equation (3). In line with program goals, spending on medicine and total household medical services decrease for SP beneficiaries, although the effect of SP on hospital spending is large and positive, and none of the results are significantly different from zero.

5.3   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

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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 & Thomas (1998)).[13]

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 (8) shows the effect of *Seguro Popular* on these two measures of health status, at both the individual and household level, and for both males and females For both health measures, the effect of SP on the number of sick days experience in the past month is estimated following regression (3) using a Tobit specification. Bootstrapped standard errors are also estimated. At both the individual and aggregated household level, Table (8) reports a significant increase in the number of sick days experienced in the past month, measured by self-reports. Consistent with the positive bias inherent in this type of measure, both individuals and households experience about 1 day more of illness each month once they are enrolled in the *Seguro Popular* program. This corresponds to a 40 percent increase over baseline illness for households, and an 82 percent increase over baseline illness for individuals. The effect appears to be driven by females, for whom the effect of SP on self reported illness is positive and significant. No such effect exists for males. Table (8) also reports the effect of SP on the number of sick days experienced by households and individuals, measured by the individuals' ability to perform ADLs. In both cases, the effect of SP is small, positive, and insignificant. When the effect is broken down by gender, however, the males actually experience a decrease in the number of sick days reported, although this effect is also insignificant.

In order to better understand these results, Table (9) breaks down the effect of SP on reported illness by age and gender. Panel A reports the effect for individuals under 10, individuals between 11 and 30, individuals between 31 and 55, and those over 55. Panels B and C report results for the same age groups, but broken down into male and female, respectively. The results in Table (9) are mixed. Children under 10 appear to be slightly healthier, reporting fewer days sick in the past month by both measures, but these results are insignificant. Conversely, individuals over the age of 55 report being slightly sicker after enrolling in SP, again by both measures, although these results are not significant

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[13] 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.

either. Adults between the ages of 31 and 55 are the only group to report a significant increase in self reported illness, with an increase of 2.5 sick days. Again,. this result appears to be driven by females, who report 4.4 more sick days after treatment, while males in this age group actually appear to be slightly healthier. These results, while interesting, are all quite small, and indicate that SP has had little to no effect on the health status of the families studied, as measured by the health status indicators available. It is also important to not that the families in this study were only enrolled in SP for a maximum of 2 years by the end of the available data. Given their increased usage of health care services, they may have experienced long term improvements to their health that I was not able to measure.

5.4 Employment

Another way by which changes in health status can be measured is through employment. Reasoning that healthier individuals are better able to work, some researchers have posited a link between improved health and an increase labor force participation. Alternatively, healthier people may enjoy their leisure periods more or may be more productive during the hours they do choose to work, and therefore may decrease their labor force participation in response to improved health (Dow et al. (2003)). To detect whether there is an effect of *Seguro Popular* on health that can be measured through a change in labor market decisions, I estimate the effect of SP on employment status, hours worked in a typical week, and weeks worked in the past year. The effects are estimated for all individuals between the ages of 15 and 65 and for household heads only following regression (3). The effect of SP on the probability of being employed is estimated with a linear probability model, with standard errors clustered at the household level in the case of all individuals and at the *municipio* level in the case of household heads. The effect of SP on hours and weeks worked is estimated following the same regression equation using a Tobit specification with bootstrapped standard errors.

Table (10) reports the results of these regressions for household heads between the ages of 15 and 65, adults who were not the head of household, adult males, and adult females. While the effect of SP on the labor market participation of household heads is small and insignificant, there is a significant decrease in hours worked by secondary workers. These workers decrease their labor force participation by 7.8 hours per week. When the sample is restricted by gender, the negative effect of SP on hours worked remains, although the standard errors are too large to claim that these differences are significantly different from zero. The effect of SP on the probability of being employed and the number of weeks worked remains essentially zero for these sub-groups.[14]

To better understand these results, Table (11) gives the estimated effect of *Seguro Popular* enrollment on labor force participation by age and gender. Panel

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[14]Results are estimated for household heads alone, but are not reported here. They are small and insignificant.

A presents the estimated coefficients for all adults between 15 and 24, adults between 25 and 44, and adults between 45 and 65. Results for the same age groups, but estimated separately for males and females, are presented in Panels B and C, respectively. Younger workers, those between 15 and 24, see the largest drop in their hours worked per week, although the results are not significant. There is a large and significant drop in the probability of being employed for young males. This group is 9.4 percentage points less likely to work than their counterparts without SP. Conversely, for older workers, the estimated effects are mostly positive, and adults between 45 and 65 work significantly more weeks per year, perhaps due to improved health status.

It is difficult to draw firm conclusions from these results, but the reactions of both the younger and older workers are consistent with models presented above. Older workers may be increasing their labor force participation in response to improved health. Younger male workers, on the other hand, are more likely to be working to supplement the family income rather than to support a family. If enrollment in *Seguro Popular* effectively increases the family income, there is less need for the income these workers bring in, and it is not surprising to see them decrease their labor supply. Although I was not able to measure any effects of SP on health care spending, it is possible that this effect of SP on secondary workers is a reflection of the money being saved by the household on health care expenses.

5.5 Selection

To determine factors that influence a family's decision to enroll in *Seguro Popular*, I estimated equation (4) on the 2002 characteristics of a sample of households that became eligible for SP between 2002 and 2004. Of these, 819 chose to enroll in the program the year that it was offered to them, and the remaining 3,680 had not enrolled by the end of 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 probit model with *municipio* fixed effects and standard errors clustered at the *municipio* level. The estimated coefficients, which have been multiplied by 100 to express the results in terms of percentage points, are shown in Table (12). The demographic factors that positively and significantly affected SP enrollment are the female to male ratio in the household, and enrollment in the Oportunidades program. Additionally, households containing members of an indigenous group, female headed households, and households with more residents are significantly less likely to enroll in the program. Oportunidades beneficiaries, while technically eligible for SP automatically, are only 9.5 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 3.5 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 population.

Table (12) also shows the effect of 2002 levels of health care consumption and employment on enrollment in SP. Families with a member that has visited a health clinic in the past month significantly increases the probability of enrolling SP, as does the number of clinic visits. Having a member admitted to the hospital in the past year did not significantly affect enrollment, however.[15] The effect of baseline employment characteristics on SP affiliation is also measured. Although log of income is positively and significantly correlated with affiliation, both employment status and number of employed household members has no effect. The small, but positive relationship between household income and SP enrollment is consistent with findings by Gakidou *et al.* (2006) and Scott (2006) who find that although SP was ostensibly targeted to the poorest members of the poorest communities, early enrollment has been highest among families in the second lowest income decile and those living in communities with high, but not the highest, levels of deprivation.

5.6   Method Validity

To measure the effects of a social program with a multi-year panel of household data like the ENCELURB data set, one can also use the traditional difference in difference estimator. This estimator measures the difference between the change in outcomes for the treated families and compares it to the difference in the change in outcomes for the families that are not treated, over the same time period. I did not employ this method for the preceding sections because enrollment in *Seguro Popular* is voluntary, and I am concerned that there may be fundamental differences between the types of families that choose to enroll in a program providing free (or subsidized) health care and the types of families that do not enroll. For example, families that choose to enroll in the program may do so because they have a sick family member or anticipate needing maternity services in the near future. If this is the case, then a measured increase in use of medical services after program enrollment may be due to these increased needs, rather than the increased access that the program provides. This difference in trends between treated and control families violates the identifying assumption of difference-in-difference estimation, and leads to biased estimates of the effect of treatment.

Since this traditional difference-in-difference estimator is widely used to measure treatment effects, however, I have estimated the effect of SP on a select group of outcomes using traditional d-in-d. I then compare these estimated treatment effects to those measured using my modified d-in-d estimator. The difference in the estimates then serves as a measure of the bias present when researchers use traditional d-in-d to estimate treatment effects of voluntary programs. For this part of the analysis, I used 3,300 families (10,063 individuals) as

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[15]Coefficients for health status and health care spending were all small and not significantly different from zero, and are not reported in the table.

my control sample. These were families that did not receive health coverage from any formal social security program (IMSS or ISSSTE) and were not privately insured during the 2002 through 2004 period, and that lived in one of the 74 ENCELURB municipalities that were not admitted into the SP program until 2005 or later. The treated families are the same 891 families (3,491 individuals) used throughout this paper.

Table (13) shows the effect of SP on individual level consumption of health care services, estimated using the traditional d-in-d estimator. Results are qualitatively similar to those found in Table (5), with the probability of clinic usage and total health care usage, as well as the number of times these services are used,increasing, while pharmacy usage decreases. The percentage change in these outcomes is similar to that presented in Table (5), but the magnitude of the changes is much smaller. Table (14) shows the effect of SP on household level hospital admissions, hospital spending, and spending on medicine. The percentage change in hospital admissions is similar to that estimated by the modified d-in-d estimator, but the effect of SP on the number of days spent in the hospital is small and insignificant. Table (14) also shows that enrollment in SP reduces household spending on medication by 202 pesos per month, or 198 percent of this population's 2002 spending. This result is significantly different from zero, and twice as large as the effect found by the modified d-in-d estimator. Finally, Table (15) gives the traditional difference-in-difference results for employment outcomes. These results are quite different from those found by the modified d-in-d estimator. Using the traditional method of estimating treatment effects, I find that enrollment in SP has a small, but significant, effect on all three measures of labor force participation for household heads, but no effect on the employment decisions of workers who are not household heads.

To further measure the bias introduced by traditional d-in-d methods, I performed a second series of traditional difference-in-difference estimates using the group of 3,680 families (19,234 individuals) that were living in treated municipalities and eligible for treatment between 2002 and 2004 but did not choose to enroll in *Seguro Popular*. These results present a slightly different picture of the bias inherent in the traditional d-in-d method, since the control families are already known to be the type that do not choose to enroll in SP, but the estimated treatment effects are similar to those presented in Tables (13), (14), and (15) above, and are presented in the appendix. Table (19) contains the effect of SP on individual health care consumption. Table (20) contains the effect of SP on household level hospital admissions, medical spending, and spending on medicines, and Table (21) presents the effect of SP on labor force participation for household heads and non-household heads separately.

5.7   Effects for Non-Adopters

To confirm that the effects measured above are valid treatment effects and not simply changes in household behavior correlated with *municipio* or year-level shocks, I run a series of tests on non-adopters in the same *municipios* as the treated households. Using 28,110 individuals in eligible but non-treated house-

holds, I measure the effect of living in an SP eligible municipio on health care utilization, health spending, and employment. Table (16) shows the effect of eligibility on the probability of visiting a hospital, public health clinic, or pharmacy clinic in the past month, along with the overall probability of making any kind of health care visit and the number of these visits. The Table shows that becoming eligible for SP but not adopting actually tends to slightly decrease an individual's probability of seeking all types of medical care by about one tenth of one percent, although this difference is not significantly different from zero. Table (16) also shows that there is no effect of eligibility on the number of health care visits experienced by eligible individuals.

Table (17) shows the results for the analysis of the effect of eligibility on household inpatient hospital services and household medical spending. The effect of SP eligibility on this group is a very small, insignificant decrease in the probability of being admitted to the hospital, and a significant decrease in the number of days spent in the hospital of about one third of a day. The effect of SP eligibility on household medical spending is, again, small and insignificant.

Finally, Table (18) shows the effect of eligibility on employment outcomes for adults in non-adopting households. Results are shown for both household heads and secondary workers. There is an economically interesting, but insignificant 2.7 percentage point drop in the probability of being employed for household heads after SP eligibility. The other labor supply outcomes, hours worked per week and weeks worked per year are small, positive, and insignificant, though. The results for secondary workers are even smaller, and insignificant.

6   Conclusion

This paper presents the first estimates of the effect of Mexico's *Seguro Popular* program on a multi-year panel of household level data. I find a significant increase in the probability of families utilizing health care services, and a significant increase in the number of times these services are used, especially among young children. I find no change in health care spending for families enrolled in the *Seguro Popular* program, nor do I find any improvement in health outcomes. In fact, I find a small but significant increase in self-reported illness for adult women. Finally, I find a significant decrease in labor market participation for adult secondary workers in households enrolled in *Seguro Popular*, especially for males between 15 and 24, while older adults appear to increase their labor supply as a result of the program.

While suggestive, these results are quite preliminary, measuring only the first two years of program effects. A more complete picture of the effects of SP should emerge as data becomes available for later years, and further analysis is needed before the success of failure of the *Seguro Popular* program can be determined. Future research should look more carefully at the heterogeneity of impacts by age and sex, especially investigating the benefits of SP for young children. To this end, I plan to investigate the effect of SP on infant mortality in upcoming research.

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7 Tables

Table 1: 2002 Summary Statistics for Individuals and Families Treated in 2002/2003 and Individuals and Families Treated in 2004 - Demographics and Employment

		Treated in 02/03	Treated in 04
Demographics	% Female	0.53	0.51
		[0.20]	[0.19]
	Indigenous	0.14	0.05*
		[0.35]	[0.23]
	Education of Head	2.06	1.82*
		[1.28]	[1.05]
	Female Head	0.24	0.16*
		[0.43]	[0.37]
	Oportunidades	0.49	0.59*
		[0.50]	[0.49]
	No. of Residents	4.70	5.15*
		[1.92]	[1.80]
	No. Females 15-49	1.22	1.22
		[0.74]	[0.65]
	No. Under 6	0.72	0.82
		[0.86]	[0.82]
Employment	Employed Member	0.89	0.93
		[0.31]	[0.25]
	No. Employed	1.34	1.48
		[0.87]	[0.98]
	HH Income	2632.44	2327.05
		[4063.39]	[3190.33]
	Per Capita Income	596.12	493.04
		[927.76]	[762.24]
	N	631	208

Table 2: 2002 Summary Statistics for Individuals and Families Treated in 2002/2003 and Individuals and Families Treated in 2004 Continued - Family Health Care Usage, Spending and Health

		Treated in 02/03	Treated in 04
Health Care Utilization	Used Hospital	17.43	11.70
		[53.00]	[47.00]
	No. of Times	0.29	0.14
		[1.18]	[0.64]
	Used Clinic	21.00	19.00
		[41.00]	[37.00]
	No. of Times	1.13	0.82*
		[1.99]	[1.42]
	Used Pharmacy	8.08	3.72
		[36.00]	[28.00]
	No. of Times	0.11	0.04
		[0.50]	[0.31]
	Total Health Usage	33.00	31.00
		[47.00]	[44.00]
	No. of Times	1.38	0.98*
		[2.11]	[1.60]
	Hosp Inpatient	19.65	17.00
		[40.00]	[33.00]
	Days in Hospital	0.26	0.17
		[1.28]	[1.13]
Spending	Total HH Medical	130.20	67.34
		[486.25]	[250.15]
	Medecine Spending	94.44	54.37
		[330.18]	[140.60]
	Hospital Spending	280.80	148.88
		[1397.27]	[622.13]
Health	Self Reported Sick	1.90	1.77
		[3.81]	[3.09]
	Unable to Perform ADL	27.95	28.55
		[37.81]	[36.95]
	N	631	208

Table 3: 2002 Summary Statistics for Individuals and Families Treated in 2002/2003 and Individuals and Families Treated in 2004 Continued - Individual Health Care Utilization, Health, and Employment

		Treated in 02/03	Treated in 04
Health Care	Used Hospital	3.57	2.60
Utilization		[18.55]	[15.91]
	No. of Times	0.05	0.03
		[0.30]	[0.20]
	Used Clinic	16.54	16.72
		[37.16]	[25.80]
	No. of Times	0.26	0.21
		[0.70]	[1.09]
	Used Pharmacy	1.77	0.91
		[13.17]	[0.95]
	No. of Times	0.02	0.02
		[0.18]	[0.22]
	Total Health Usage	19.69	18.77
		[39.77]	[33.64]
	No. of Times	0.31	0.22*
		[0.76]	[0.61]
	Hosp Inpatient	4.95	4.28
		[21.69]	[17.81]
	Days in Hospital	0.20	0.09*
		[1.29]	[0.69]
Health	Self Reported Sick	1.55	1.04
		[0.47]	[0.31]
	Unable to Perform ADL	0.61	0.50
		[3.17]	[2.68]
Employment	Employed	26.52	25.65
		[44.15]	[43.69]
	Hours per Week	13.25	12.15
		[25.41]	[24.97]
	Weeks per Year	11.4	12.63
		[24.61]	[30.13]
N		2606	885

Table 4: Effect of Seguro Popular on Household Level Health Visits in the Previous Month

	Probability of Usage (%)			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	5.58	13.86***	-1.92	11.36***
se	[3.59]	[4.06]	[2.62]	[3.42]
Observations	2457	2457	2457	2457
Percent Change	34.92	67.64	-27.53	34.96
	Times Used			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	0.49	1.41***	-0.71	0.99***
se	[0.64]	[0.34]	[0.76]	[0.30]
Observations	2457	2457	2457	2457
Percent Change	195.90	133.98	-10.18	77.50

Note: Data from 819 households. Control variables include status in the Oportunidades program, indicator of female headed household, number of children under 6, number of adults over 60, median household age, number of females 15 to 49, number of household residents, and per capita household income. Household random effects, and year, municipio fixed effects are included. Standard errors are clustered at municipio level and bootstrapped.

Table 5: Effect of Seguro Popular on Individual Level Health Visits in the Previous Month

	Probability of Usage (%)			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	1.58	7.03***	-0.854**	6.65***
se	[0.98]	[1.70]	[0.40]	[1.78]
Observations	10473	10473	10473	10473
Percent Change	47.53	42.39	-55.03	34.18
	Times Used			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	0.72**	0.89***	-1.00**	0.71***
se	[0.36]	[0.16]	[0.50]	[0.15]
Observations	10473	10473	10473	10473
Percent Change	1602.50	359.85	-5000.00	247.23

Note: Data from 3,491 individuals. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 6: The Effect of Seguro Popular on Clinic Usage and Total Health Care Usage in the Past Month by Age Group

Probability of Usage (%)

	Clinic				Total			
	Under 10	10 to 30	31 to 55	Over 55	Under 10	10 to 30	31 to 55	Over 55
Treatment	8.70***	5.14**	6.41***	2.88	6.80**	4.95**	7.05***	6.49
se	[2.81]	[2.08]	[2.42]	[6.20]	[2.87]	[2.22]	[2.56]	[8.28]
Observations	3321	3345	2652	447	3321	3345	2652	447

Times Used

	Clinic				Total			
	Under 10	10 to 30	31 to 55	Over 55	Under 10	10 to 30	31 to 55	Over 55
Treatment	0.99***	0.79**	0.83**	0.30	0.69***	0.66**	0.74**	0.48
se	[0.25]	[0.33]	[0.33]	[0.51]	[0.24]	[0.30]	[0.29]	[0.51]
Observations	3321	3345	2652	447	3321	3345	2652	447

Note: Data from 3,491 individuals. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 7: Effect of Seguro Popular on Household Level Hospitalizations and Hospital Spending in the Past Year and Other Medical Spending in the Past Month

| | Inpatient Services | | | Spending | |
	Admitted	No. Days	Medicine	Hospital	HH Total
Treatment	7.28**	2.92**	-104.11	891.04	-116.20
se	[3.32]	[1.39]	[67.19]	[1,258.94]	[141.70]
Observations	2457	2457	2457	2457	2457
Percent Change	25.91	1211.61	-123.55	360.31	-101.72

Note: Data from 819 households. Probability of hospital admission multiplied by 100. Control variables include status in the Oportunidades program, indicator of female headed household, number of children under 6, number of adults over 60, median household age, number of females 15 to 49, number of household residents, and per capita household income. Household random effects, and year, municipio fixed effects are included. Standard errors are clustered at municipio level and bootstrapped.

Table 8: Effect of Seguro Popular on Two Measures of Health Status in the Past Month

	Household		Individual	
	Self Report	**ADL**	**Self Report**	**ADL**
Treatment	0.76*	0.23	1.16*	0.02
se	[0.41]	[4.20]	[0.60]	[0.10]
Observations	2457	2457	10473	10473
Percent Change	40.75	0.82	81.65	3.44
	Males		**Females**	
	Self Report	**ADL**	**Self Report**	**ADL**
Treatment	0.25	-1.22	1.79**	0.77
se	[0.91]	[1.25]	[0.79]	[1.17]
Observations	4878	3999	5595	4743
Percent Change	22.14	-278.28	104.95	113.68

Note: Data from 3,491 individuals. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 9: Effect of Seguro Popular on Two Measures of Health Status in the Past Month by Age and Gender

A. Population

	Under 10		11 to 30		31 to 55		55 and Over	
	Self	ADL	Self	ADL	Self	ADL	Self	ADL
Treatment	-1.37	-1.32	1.68	-0.18	2.46**	0.57	4.74	5.43
se	[0.85]	[1.14]	[0.92]	[1.31]	[1.21]	[1.49]	[3.52]	[5.04]
Observations	3321	1590	4008	4008	2697	2697	447	447

B. Males

	Under 10		11 to 30		31 to 55		55 and Over	
	Self	ADL	Self	ADL	Self	ADL	Self	ADL
Treatment	-0.94	-0.54	2.08	-2.08	-0.33	-0.83	1.99	6.87
se	[1.22]	[1.80]	[1.40]	[1.76]	[2.01]	[2.35]	[5.35]	[6.82]
Observations	1641	762	1821	1821	1206	1206	210	210

C. Females

	Under 10		11 to 30		31 to 55		55 and Over	
	Self	ADL	Self	ADL	Self	ADL	Self	ADL
Treatment	-1.84	-1.91	1.52	1.94	4.35***	1.65	7.01	2.51
se	[1.18]	[1.45]	[1.21]	[1.90]	[1.53]	[1.95]	[4.63]	[7.28]
Observations	1680	828	2187	2187	1491	1491	237	237

Note: Data from 3,491 individuals. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 10: Effect of Seguro Popular on Labor Force Participation by Status as Household Head and Gender

	Household Heads			Non-Household Heads		
	Employed	**Hours**	**Weeks**	**Employed**	**Hours**	**Weeks**
Treatment	2.20	-0.16	0.29	-2.80	-7.80**	1.52
se	[2.20]	[2.51]	[2.26]	[0.023]	[3.54]	[2.81]
Observations	2180	2180	2180	2938	2938	2938
Percent Change	2.81	-0.39	0.78	-9.58	-61.51	12.57
	Males			Females		
	Employed	**Hours**	**Weeks**	**Employed**	**Hours**	**Weeks**
Treatment	-1.80	-3.94	-0.62	0.00	-3.45	1.55
se	[2.00]	[2.52]	[2.24]	[2.50]	[3.53]	[2.82]
Observations	2205	2205	2205	2913	2913	2913
Percent Change	-2.19	-8.85	-1.60	0.00	-33.23	13.80

Note: Samples restricted to workers 15-65 years old. Probability of employment multiplied by 100. Random effects regression with bootstrapped standard errors. Control variables include status in the Oportunidades program, sex, age, age squared, number of household residents under 6, number of female household residents between 15 and 49, total number of household residents, log of income, year and municipality fixed effects.

Table 11: Effect of Seguro Popular on Labor Force Participation by Age and Gender

A. Population

	15 to 24			25-44			45 to 65		
	Employed	Hours	Weeks	Employed	Hours	Weeks	Employed (%)	Hours	Weeks
Treatment	-0.05	-6.84	0.57	-0.20	-2.93	-2.09	3.40	-0.21	7.58*
se	[0.04]	[4.50]	[3.87]	[1.70]	[2.67]	[2.34]	[3.90]	[4.39]	[4.04]
Observations	1161	1161	1161	3087	3087	3087	870	870	870

B. Males

	15 to 24			25-44			45 to 65		
	Employed	Hours	Weeks	Employed	Hours	Weeks	Employed (%)	Hours	Weeks
Treatment	-9.40**	-8.35	-0.62	-2.70	-3.69	-4.12	4.50	-2.57	7.24
se	[3.80]**	[6.12]	[4.75]	[3.00]	[3.30]	[2.90]	[3.40]	[5.19]	[4.91]
Observations	492	492	492	1317	1317	1317	396	396	396

C. Females

	15 to 24			25-44			45 to 65		
	Employed (%)	Hours	Weeks	Employed (%)	Hours	Weeks	Employed (%)	Hours	Weeks
Treatment	-1.40	-0.83	2.83	0.60	-4.71	-1.58	1.90	2.54	7.23
se	[4.00]	[6.50]	[6.20]	[2.50]	[4.89]	[3.67]	[6.80]	[8.04]	[6.59]
Observations	669	669	669	1770	1770	1770	474	474	474

Note: Samples restricted to workers 15-65 years old. Probability of employment multiplied by 100. Random effects regression with bootstrapped standard errors. Control variables include status in the Oportunidades program, sex, age, age squared, number of household residents under 6, number of female household residents between 15 and 49, total number of household residents, log of income, year and municipality fixed effects.

Table 12: Determinants of Household Affiliation with Seguro Popular

Variable	Enrollment
Hospital Inpatient	0.35
	[1.07]
Clinic Visit	1.34**
	[0.58]
No. of Clinic Visits	0.60*
	[0.33]
Employed	0.30
	[1.64]
No. Employed	-0.70
	[0.43]
Log of Income	0.91***
	[0.32]
Oportunidades	9.46***
	[1.74]
Indigenous	-3.54**
	[1.39]
Percent Female	4.77**
	[2.06]
Education of HH Head	-0.60
	[0.50]
Female HH Head	-1.80**
	[0.88]
No. Under 6	-0.89
	[0.55]
Median Age	-0.12**
	[0.052]
No. Females 15-49	-0.59
	[0.68]
No. of Residents	-0.37*
	[0.21]
Observations	4681

Table 13: Effect of Seguro Popular on Individual Health Care Utilization in the Past Month - Difference in Difference Results

	Probability of Usage (%)			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	-0.55	2.58***	-0.85***	2.18**
se	[0.41]	[0.91]	[0.25]	[0.93]
Observations	121989	121989	121989	121989
Percent Change	-28.60	34.06	-68.31	18.23
	Times Used			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	-0.29	0.59***	-0.01***	0.41***
se	[0.25]	[0.10]	[0.00]	[0.09]
Observations	121989	121989	121989	121989
Percent Change	-1012.13	503.28	-60.42	216.97

Note: Data from 40,663 eligible individuals. Control group chosen from eligible households in non-SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 14: Effect of Seguro Popular on Household Level Hospitalizations in the Past Year, Hospital Spending in the Past Year and Other Health Care Spending in the Past Month- Difference in Difference Results

| | Inpatient Services | | Spending | | |
	Admitted(%)	No. Days	Medicine	Hospital	HH Total
Treatment	5.15***	0.29	-202.20***	514.90	16.29
se	[1.64]	[0.29]	[50.05]	[680.80]	[20.71]
Observations	12354	12357	12354	12354	12282
Percent Change	37.92	34.70	-198.43	173.20	9.87

Note: Data from 40,663 eligible individuals. Probability of hospital admission multiplied by 100. Control group chosen from eligible households in non-SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 15: Effect of Seguro Popular on Labor Force Participation by Status as Household Head - Difference in Difference Results

	Houehold Heads			Non-Household Heads		
	Employed	**Hours**	**Weeks**	**Employed**	**Hours**	**Weeks**
Treatment	2.43**	2.83**	2.53*	0.37	0.82	0.43
se	[0.98]	[1.32]	[1.42]	[0.51]	[1.85]	[1.99]
Observations	25342	25341	25342	96647	96647	96647
Percent Change	3.09	6.95	6.61	2.51	11.69	6.90

Note: Data from 40,663 eligible individuals. Probability of employment multiplied by 100. Control group chosen from eligible households in non-SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 16: Effect of Seguro Popular Eligibility for Non-Adopters on Individual Health Care Utilization in the Past Month

	Probability of Usage (%)			
	Hospital	Clinic	Pharmacy	Total
Eligible	-0.13	-0.13	-0.11	-0.13
se	[0.26]	[0.40]	[0.20]	[0.49]
Observations	84330	84330	84330	84330
	Times Used			
	Hospital	Clinic	Pharmacy	Total
Eligible	-0.41	-0.05	-0.31	-0.25
se	[0.52]	[1.20]	[0.45]	[1.70]
Observations	84330	84330	84330	84330

Note: Data from 28,110 eligible non-adopters in SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 17: Effect of Seguro Popular Eligibility for Non-Adopters on Household Inpatient Services in Last Year and Health Spending in Past Month the Past Month

| | Household | | | | |
	Inpatient Svcs.	Days in Hosp.	Medicine	Hospital	HH Total
Eligible	-0.20	-0.32*	-2.04	7.18	2.91
se	[0.94]	[0.19]	[11.02]	[52.36]	[58.10]
Observations	19354	19354	19354	19354	19354

Note: Data from 6,452 eligible non-adopting households in SP cities. Probability of hospital admission multiplied by 100. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 18: Effect of Seguro Popular Eligibility on Employment Outcomes for Non-Adopters

	Household Heads			Non-Household Heads		
	Employed	**Hours**	**Weeks**	**Employed**	**Hours**	**Weeks**
Eligible	-2.74	0.18	1.18	-0.62	-0.09	-0.39
se	[2.15]	[1.00]	[1.97]	[0.64]	[0.35]	[0.67]
Observations	18648	18647	18648	65682	65682	65682

Note: Data from 28,970 eligible non-adopters in SP cities. Probability of employment multiplied by 100. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

8 Figures

Figure 1: Distribution of Poverty Head Count Ratios for Treated ENCELURB
Cities by Treatment Year

Figure 2: Probability of Member of Treated Household Visiting Local Health Clinic in Past Month
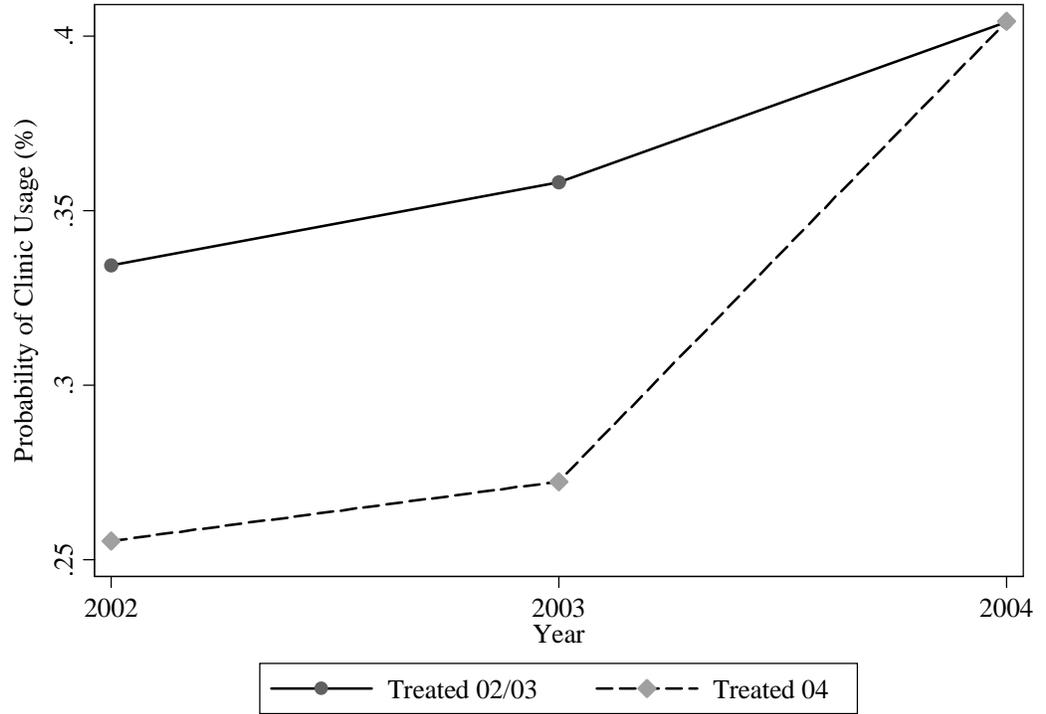
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 3: Number of Visits in Past Month to Local Health Clinic by Members of Treated Households
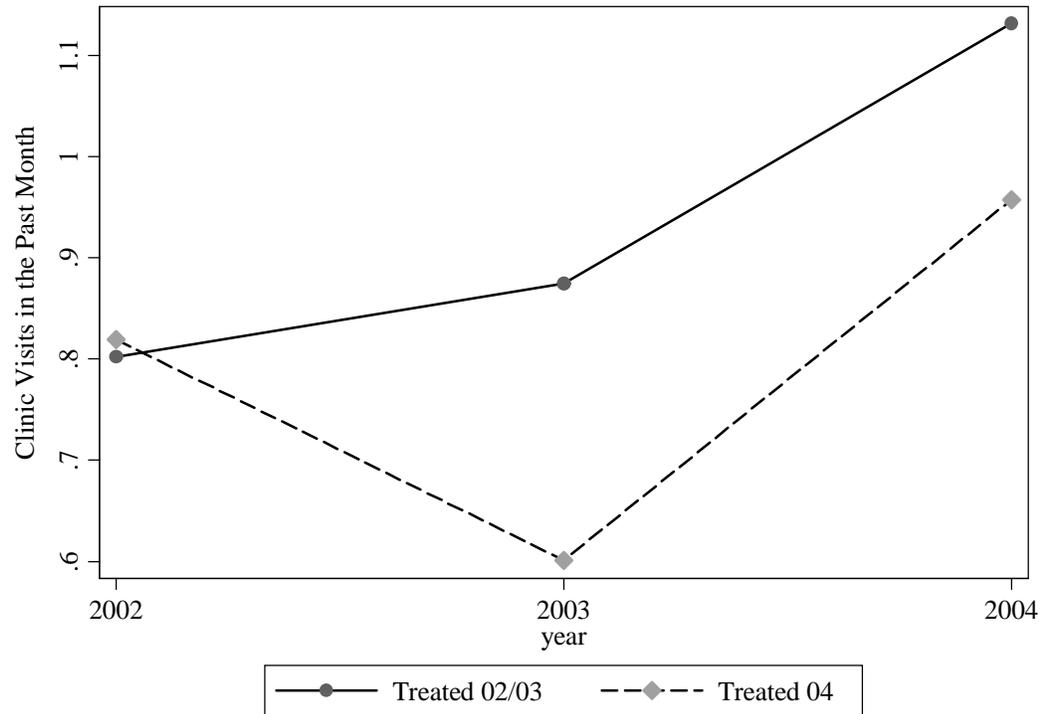
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 4: Probability of Member of Treated Household Visiting Pharmacy-Based Health Clinic in Past Month
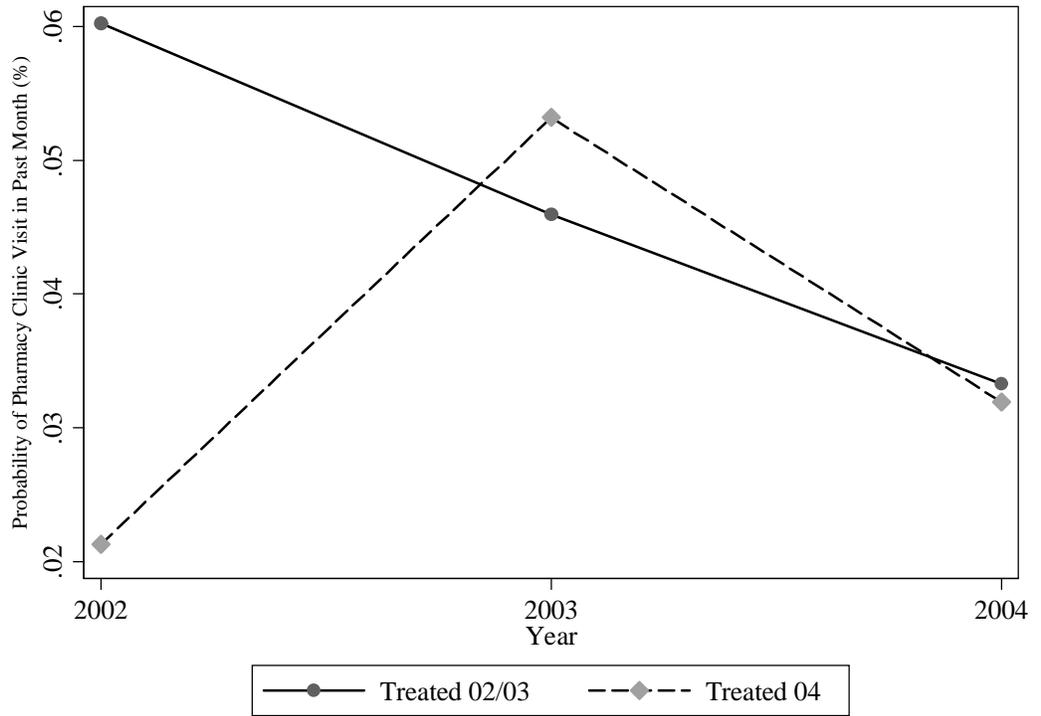
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 5: Number of Visits in Past Month to Pharmacy-Based Health Clinic by Members of Treated Households
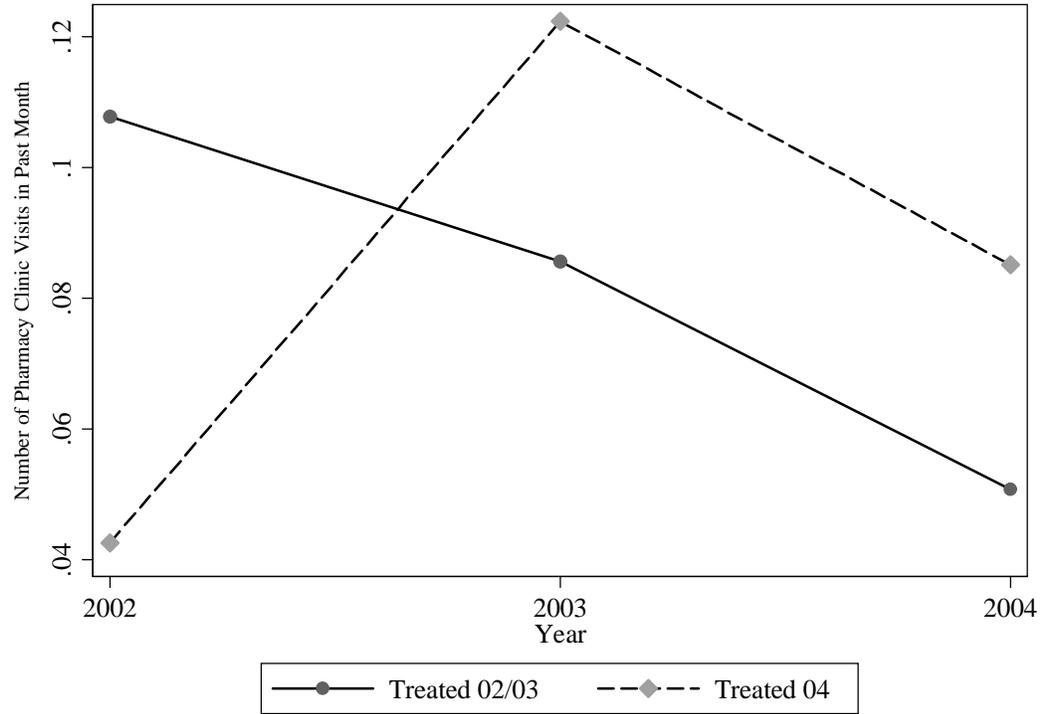
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 6: Self Reported Days Sick in the Past Month by Members of Treated Households
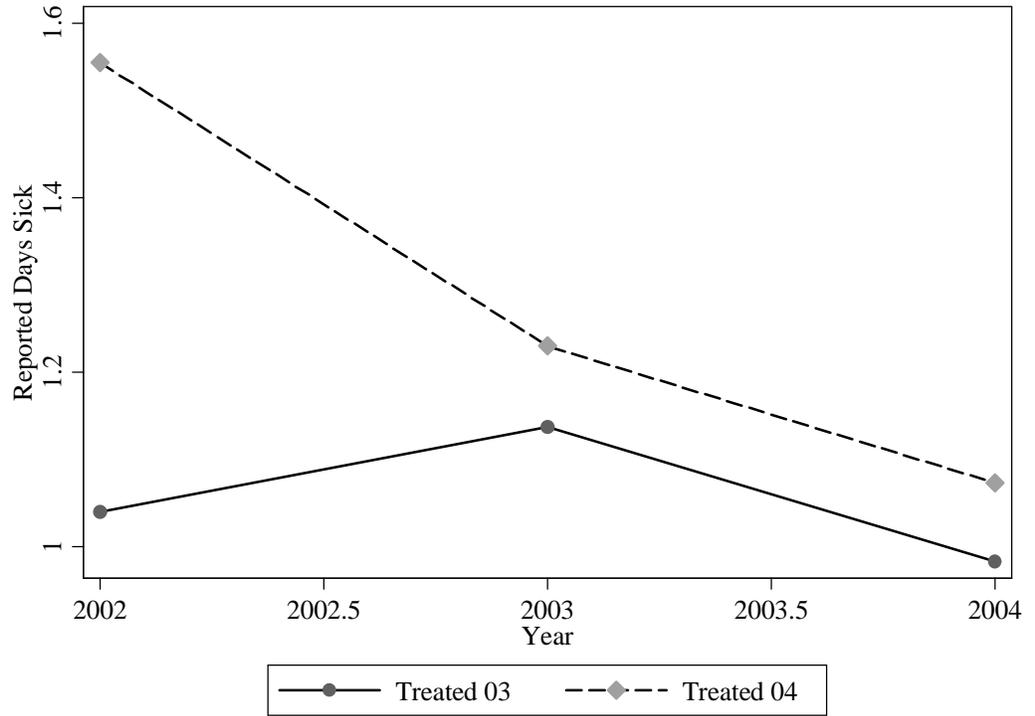
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 7: Reported Days Unable to Perform Activities of Daily Living (ADLs)
in the Past Month by Members of Treated Households
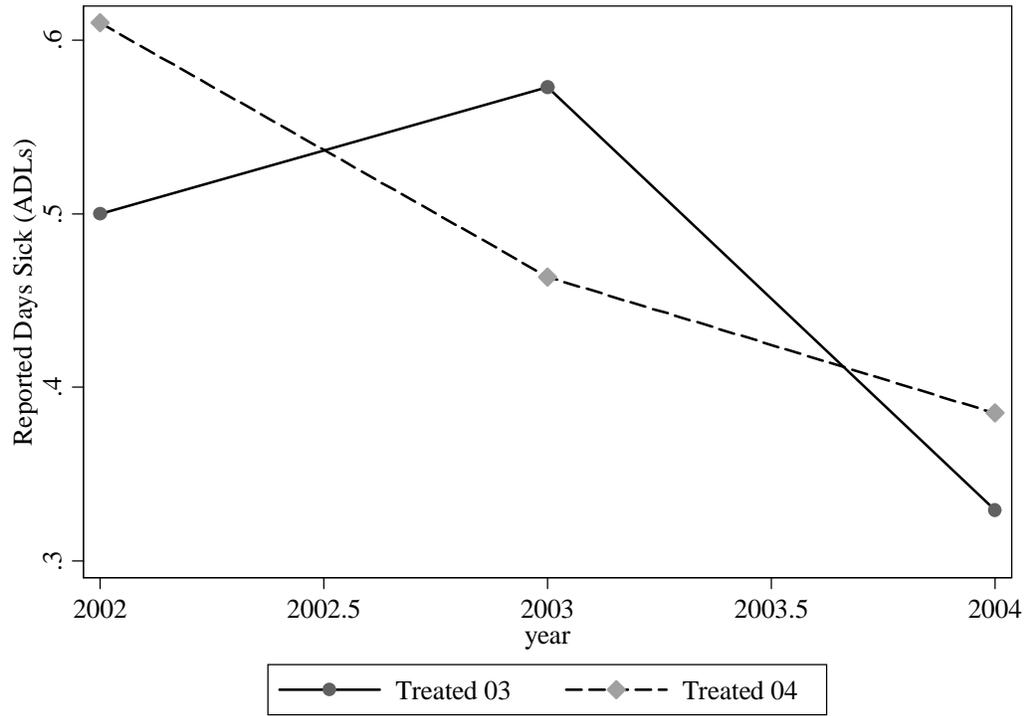
Note: 3,491 treated individuals. ENCELURB data averaged by treatment group.

Figure 8: Probability of Employment for Adults 15 to 65 in Treated Households
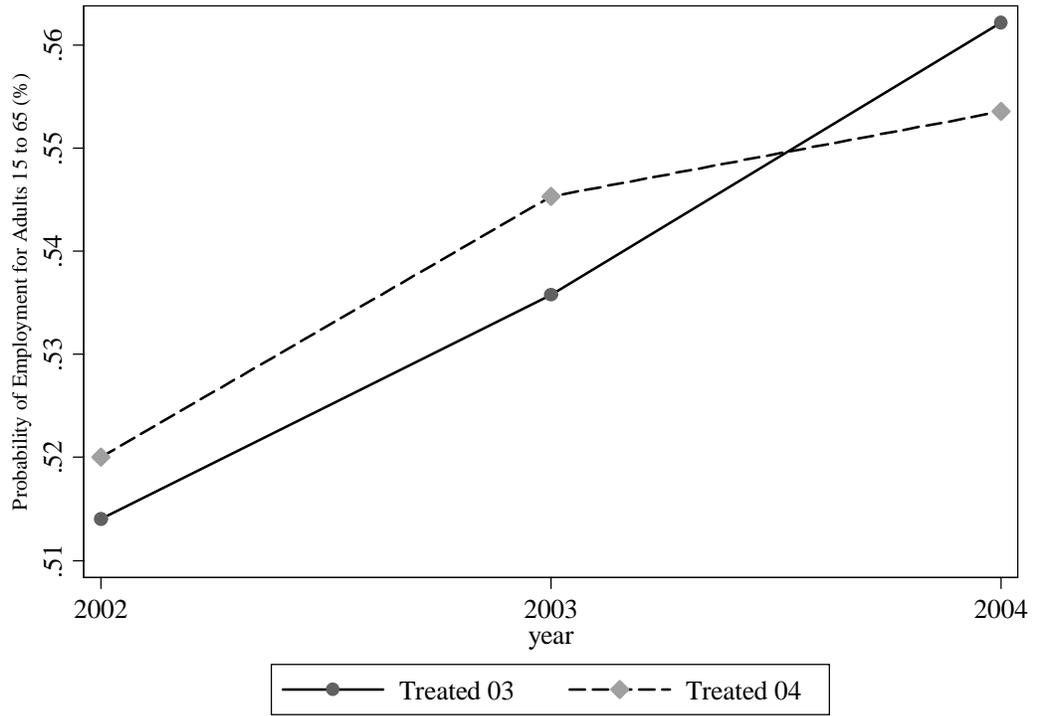
Note: 1,706 treated individuals. ENCELURB data averaged by treatment group.

9 Additional Tables

Table 19: Effect of Seguro Popular on Individual Health Care Utilization in the Past Month - Difference in Difference Results with Alternative Control Group

	Probability of Usage (%)			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	-0.09	2.51***	-1.00***	2.02**
se	[0.44]	[0.97]	[0.28]	[1.00]
Observations	68715	68715	68715	68715
	Times Used			
	Hospital	**Clinic**	**Pharmacy**	**Total**
Treatment	0.10	0.57***	-0.01**	0.40***
se	[0.28]	[0.11]	[0.01]	[0.10]
Observations	68715	68715	68715	68715

Note: Data from 22,725 eligible individuals. Control group chosen from eligible non-adopters in SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 20: Effect of Seguro Popular on Household Level Hospitalizations in the Past Year, Hospital Spending in the Past Year and Other Health Care Spending in the Past Month- Difference in Difference Results with Alternative Control Group

| | Inpatient Services | | | Spending | |
	Admitted (%)	No. Days	Medicine	Hospital	HH Total
Treatment	5.98***	0.31	-189.9***	514.90	-6.53
se	[1.82]	[0.22]	[45.58]	[680.80]	[18.33]
Observations	13495	13495	13495	13495	13495

Note: Data from 4,798 eligible households. Probability of hospital admission multiplied by 100. Control group chosen from eligible non-adopters in SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.

Table 21: Effect of Seguro Popular on Labor Force Participation in the Past Month - Difference in Difference Results with Alternative Control Group

	Household Heads			Non-Household Heads		
	Employed	**Hours**	**Weeks**	**Employed**	**Hours**	**Weeks**
Treatment	3.54***	4.34***	3.51**	0.52	1.31	2.10
se	[1.15]	[1.44]	[1.69]	[0.49]	[1.99]	[2.27]
Observations	14392	14391	14392	20023	20023	20023

Note: Data from 11,471 eligible individuals. Probability of employment multiplied by 100. Control group chosen from eligible non-adopters in SP cities. Control variables include age, age squared, sex, status in the Oportunidades program, indicator household head, number of children under 6, number of adults over 60, number of females 15 to 49, number of household residents, and log of income. Individual random effects, and year, municipio fixed effects are included. Standard errors are clustered at household level and bootstrapped.