# Wealthier But Not Much Healthier: Effects of a Health Insurance Program for the Poor in Mexico

Rodrigo Barros*
Stanford University

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**Abstract**

In 2002 the Mexican government began a very large expansion of government-funded healthcare for the poor - specifically, people not employed in the formal sector. The program, Seguro Popular (SP), was rolled out sequentially across different areas in Mexico. This paper uses the variation in program intensity over time and space induced by the roll-out, comparing people in the informal sector (eligible for SP) to those in the formal sector (ineligible for SP), to measure the program's impacts. I find that the program substantially reduced out-of-pocket health expenditures of beneficiaries and caused them to shift from private to public providers. However, the program had a negligible effect on the health of beneficiaries, perhaps because the quality of care was low. The program also had no effect on labor force participation or earnings. One worry among policymakers is that Seguro Popular might induce workers to shift into the informal sector. I find no evidence of this effect. The low quality of care provided under SP, while reducing the welfare gains to beneficiaries, may have prevented the unintended consequence of encouraging movement into the informal sector.

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# 1 Introduction

In 2002, the Mexican government began to implement a very large expansion of government-funded health services for the poor, a program called Seguro Popular. The program targeted people who were not working in the formal sector of the economy and who, therefore, were not covered by the formal-labor-market health insurance system. This paper uses the variation over time and space induced by the roll-out process of Seguro Popular (SP) to assess the impact of the program. I present evidence on how SP affected individuals' health, their utilization of healthcare services, and their expenditure on healthcare services, as well as their labor market outcomes.

The Mexican public healthcare system is divided into two segments. Workers in the formal labor market and their households (about half of the total population) are covered by a system called Social Security that is financed mostly by payroll taxes.[1] The rest of the population has access to a separate public healthcare system financed by the federal government with general revenues. I call this system the non-SS system, where non-SS refers to non-Social-Security. In both systems, the government is the payer and the provider of healthcare, but the systems are entirely distinct, with separate governing bodies, facilities, and physicians.

Seguro Popular represented a major expansion of the non-SS healthcare system. Prior to its implementation, there were very large differences in resources between these two segments. On practically every measure of quality of service (e.g. staff, pharmaceutical material, hospital beds per patient), the Social Security segment was substantially better (OECD (2005)). In terms of expenditure per patient, the gap between the two segments of the Mexican public health system was comparable to the difference between the public health system of a middle income country like Bulgaria and a sub-Saharan country like Gabon (World Bank (2007)).

The aim of Seguro Popular was to provide much more generous healthcare services to the population outside of the formal labor market. For example, medical services and pharmaceuticals were subject to the payment of income-related user charges before SP, but were covered without co-payments under SP. SP entailed an 85% increase in government expenditure per capita for the 50 million people in informal-sector households (OECD (2005)).

Access to more generous health insurance is hypothesized to affect households in several ways. First, uninsured households need to devote a larger part of their budget to fixing a health problem,

[1] For the purposes of this paper, a worker is formal if she or he is registered with a Social Security institute, pays payroll tax, and is, therefore, entitled to Social Security medical services.

i.e. spending on healthcare, which diverts resources from the consumption of other goods. Access to health insurance should reduce these out-of-pocket health expenses. Second, health insurance may or may not improve health. On the one hand, utilization of healthcare services might increase. On the other hand, given the bundling of payer and provider, there might be changes to the quality of care as well as to the quantity of care. Third, health shocks might diminish the capacity of the household to generate income because, for example, a household member is not healthy enough to work. If better health insurance leads to better health, then it might cushion households against this labor productivity channel.[2] My analysis examines how SP affected these various outcomes.

Fortunately for the purpose of evaluation, the SP program was such a large undertaking that it had to be rolled out gradually. For political and logistical reasons, the roll-out sequence across states in Mexico was somewhat arbitrary. I show that having a high program penetration during the roll-out is uncorrelated with a state's initial health needs or other development indicators. I employ a triple-difference estimation strategy that uses variation in program intensity over time and space induced by the roll-out, and compares poeple in the informal sector (eligible for SP) to those in the formal sector (ineligible for SP), to measure the program's impacts. The analysis uses repeated cross-sections from several large Mexican household surveys (ENSA and ENIGH). One of the surveys (ENIGH) has several waves of data prior to the beginning of SP, which also enables me to conduct falsification exercises by testing for "effects" in the pre-period.

I find that Seguro Popular caused a substantial decrease in household health expenditures. In addition, beneficiary households shifted from private health providers, where they pay out of pocket, to free public providers. Beneficiary households were also more likely to seek care. However, SP's impact on health status is very small or non-existent. There is also no evidence that the program affected labor supply or earnings. Putting these results together, SP's main impact was to increase by 4.2% the amount of money that beneficiaries were able to spend on non-health expenditures or save; the money was mostly used for non-health consumption. SP did not lead to increased investment in human capital (one of the policy motivations). But the program did have a redistributive impact (another motivation). Most of the tax revenue that funded the SP program was raised from formal sector households, and the program, in essence, transferred money to informal sector households conditional on sickness.

[2]The program might also have income effects on labor supply, in addition to substitution effects caused by improvements in labor productivity. Also note that, if health insurance is not sufficient to insure against lost earnings, then a complementary social policy is disability insurance. The Social Security system included disability insurance (income replacement). However, even under SP, the informal sector did not have disability insurance.

In addition, my analysis examines whether SP caused workers to shift into the informal sector. A major concern among policymakers is that improvements in the quality of healthcare services in the non-SS segment could generate incentives for formal sector workers to switch to the informal sector. The government is more successful at taxing income in the formal sector, so does not want to encourage shifts into informality. Moreover, growth of the informal sector might reduce aggregate productivity, given that informal firms have incentives to be small and have restricted access to formal credit sources (Levy (2008)).

I find that SP did not induce a shift of workers into the informal sector. One potential reason for this result is the lower quality of healthcare services offered by SP compared to the SS system.[3] As the literature has shown, one potentially efficient redistribution mechanism is to offer an in-kind transfer of low enough quality that the low-income types select in but the high-income types select out (see Besley and Coate (1991) and Akerlof (1978)). Seguro Popular might meet this description. The low quality of care provided under SP, while reducing the welfare gains to beneficiaries, may have prevented the unintended consequence of encouraging movement into the informal sector.

The rest of the paper is structured as follows. Section 2 reviews the related literature, Section 3 describes the main features of the Mexican health system and the SP program. Section 4 provides background evidence about the effects of health shocks prior to the implementation of SP. Section 5 estimates the effects of the SP program. Section 6 concludes.

## 2 Related Literature

A large number of papers have analyzed the impact of government intervention in the healthcare sector. This literature has consistently found evidence of an association between subsidized health insurance and the use of health services. However, the evidence regarding the link between subsidized insurance and individual health outcomes is more mixed, with most research failing to find a positive effect. In the 1970's the RAND Health Insurance Experiment was implemented in the United States. People were assigned randomly to insurance plans with different levels of cost sharing. Brook et al. (1984) and Keeler (1992) provide good summaries of the episode. The main findings of the experiment were that cost sharing negatively affected the frequency with which individuals sought medical attention, but had no effect on most measures of health status. Expansions in Medicaid eligibility have also been used to estimate the impacts of access to subsidized

[3]It may also be the case that this effect has not fully played out, as households need more time to adjust their labor market decisions in response to the changed incentives. If this were the case, a longer time frame than the one used in this paper would be needed for a complete evaluation of the SP effects on informality.

insurance. While most papers show Medicaid's expansion had a strong effect on the utilization of healthcare services, the results for health outcomes are less clear. Racine et al. (2001), Kaestner et al. (1999), and Currie and Gruber (1997) find no evidence of a program effect on the health status of beneficiaries. Currie and Gruber (1995 and 1996) conclude that the expansion of eligibility was associated with improved health. Goldman et al. (2007) survey the literature on the association between cost sharing features of prescription drugs benefits, use of drugs, and health outcomes. Using evidence from several countries (Canada, Germany, Sweden, Taiwan, UK, US), this literature generally finds that, while increased cost sharing is associated with reduced pharmaceutical use, there is no evidence on a link with health outcomes.

Two papers have looked at the effect of the Seguro Popular program. They analyze the program impact for a dimension of health that is relevant only for a subset of the population (newborns), whereas my paper looks at several alternative measures of health that are relevant for the entire eligible population. Their findings regarding the program's effects are ambiguous. Aguilera and Marrufo (2006) use hospital discharge data at the state level to estimate the program's impact on the incidence of low birth weight. They find a significant program effect. Gallardo-Garcia (2006) uses a structural model of household behavior to analyze the SP program's effects on labor market variables and birth weight. He finds negligible program effects on informality and birth weight.

The presence of large informal labor markets in developing countries has attracted a great deal of attention. For the specific case of Mexico, several papers have analyzed empirically the flow of workers between the formal and the informal sectors. This literature has consistently found evidence against the view that the formal and informal sectors are segmented. Gong et al. (2004) find evidence of large flows of workers between the two sectors in both directions. They also conclude that the probability of movement between sectors does not depend on the age of the worker, which contradicts the hypothesis that informal workers queue to get formal jobs, and that the entry and separation rates are not significantly different across the two sectors. Maloney (1999) finds that wages sometimes increase and sometimes decrease as a worker moves from one sector into the other, and that the substantial flows in both directions persist even in periods of economic expansion.

A final strand of related literature is on the effects of health problems for household welfare in developing countries. Gertler and Gruber (2002) analyze the extent to which poor households in Indonesia are able to smooth consumption when they are hit by a health shock. They infer that health problems have large welfare costs, and conclude that public disability programs and subsidized healthcare could improve consumption insurance. Chetty and Looney (2006) present a model that illustrates that consumption fluctuations can underestimate the welfare costs of health

shocks if households are highly risk averse. Finally, Mohanan (2008) uses bus accidents in India to identify the causal effects of health shocks, and finds negative effects on education spending and positive impacts on the level of indebtedness.

# 3 Background

## 3.1 The Mexican Health System

Public healthcare services in Mexico are segmented by employment status. For workers in the formal labor market and members of their households, a set of Social Security institutes offer healthcare bundled with other services, including disability insurance and retirement pensions. These services are funded from payroll taxes and federal government subsidies.[4] About 50% of the total population, 50 million people, is insured by formal Social Security (OECD (2005)). There are no co-payments in this sector. For workers outside the formal labor market and their households, the federal government is responsible for funding healthcare services from general tax revenues, but the state governments are responsible for the administration of healthcare services. The remaining 50% of the population falls into this category. In this segment, there is a schedule of fees as a function of the declared income of the user. Fees are markedly below full cost.[5] There is no overlap between the two segments of the public health system: each segment has its own governing body, its own hospitals and clinics, and its own staff. Finally, there are a large number of private providers of health services. The OECD (2005) estimates that they provide 14% of total outpatient care. There is a great degree of heterogeneity in the prices that private providers charge, in the quality of the services that they offer, and in the characteristics of their users.

Prior to 2002, the resources of the two segments of the public health system were very different. For instance, per patient expenditure in the non-SS segment was half that of the Social Security segment. Similarly, there was greater availability of physicians, nurses, and hospital beds in the Social Security segment. Despite the fact that wages in the Social Security segment were higher, resources in the non-SS segment went almost entirely to pay wages: of all the purchases of pharmaceutical material by the public sector, the Social Security segment accounted for 95%, while the informal sector accounted for the remaining 5% (OECD (2005)). Partly as a result of the exist-

[4]Tax rates differ slightly among the various Social Security institutes. The private sector workers' institute (IMSS), which covers more than 80% of the population in the formal segment of the health system, has a non-linear rate that increases with income.

[5]For instance, for 2006 in the state of Guanajuato, the fee for the lowest of six income groups for an appendicectomy was 130 pesos; in the state of Quintana Roo the corresponding fee was 73 pesos. For the same year, the average income of the poorest sixth of informal households was 996 pesos per month, and the exchange rate was approximately 10 pesos per dollar.

ing inequalities in the quality of healthcare, there was severe inequality in health outcomes. This was reflected in different epidemiological profiles: while infectious diseases were a minor cause of deaths for the population covered by the Social Security system, they remained prevalent among the population in the non-SS segment (Gonzalez-Pier et al. (2006)).

Based on the facts above, prior to SP, households in the informal sector were likely more vulnerable to the two main ways that health problems affect household budgets: 1) households are forced to allocate a part of their budget to address the problem, diverting resources from other goods, and 2) the capacity of the household to generate income may be diminished.[6] Households in the formal sector had access to a more complete healthcare system, so they needed to divert a smaller fraction of their budget to addressing bad health. In addition, they had disability insurance. In contrast, households in the non-SS segment only had access to a lower quality public healthcare network, and were uninsured against the foregone income aspect of negative health shocks.

### 3.2 The Seguro Popular Program

Starting in 2002, a very large health program, called Seguro Popular (SP), was implemented in Mexico with the objective of providing more complete health services to the approximately 50 million people who are detached from the formal labor market. Households enrolled in SP are entitled to all the medical services and pharmaceutical materials included in a catalog, or formulary. The catalog of services and drugs includes treatment for diseases responsible for roughly 95% of the disease burden in Mexico (King (2007)).[7] Only households not covered by Social Security health services are eligible for the program, and this is the single eligibility criterion. According to the program rules, there is an annual fee for participation in SP. The fee is a function of declared household income, and households in the two lowest income groups are not required to pay. Since declared income is not verified by program administrators, practically all beneficiary households report an income that places them in the non-paying group (see Table 1).

Other than the theoretical fees, there is no co-payment for services used so that, in practice, virtually all households receive the services free of charge. Funding for the SP program comes mostly from the federal government, although state governments must also finance a small part. For every

[6] The second channel is obviously relevant when a household member who participates in the labor market has a health problem that prevents him or her from working, but it can also be present when the health problem does not involve a worker. This is the case, for example, when a household that decides to sell a part of its income-generating assets to deal with the sickness of a child.

[7] King (2007) proposes a "politically robust" program evaluation design, describes the main elements of the SP program, and tests the validity of the design on baseline data. But the paper does not estimate the effects of the program.

household that a state enrolls in SP up to a target specified for that quarter in that state, the federal government makes a transfer to the state government fixed at 37.5% of the yearly minimum wage in Mexico City (assuming 8 hours of work per day and 7 days of work per week, SPSS (2007)). In 2006, the transfer equaled approximately 6,600 pesos or about 660 dollars per household per year. The state government must contribute an additional 7.5% of a yearly minimum wage per household enrolled in the program, equal to about 1,330 pesos, or 130 dollars per year in 2006. Accordingly, the program represents a source of net federal transfers for state governments. In Mexico, the federal government's revenues roughly consist of oil revenues (50%), income tax (25%), and consumption taxes (25%). In most cases, informal sector workers do not pay income taxes, because they work in unregistered firms. Moreover, according to the Ministry of Finance, approximately 75% of total revenues from consumption taxes come from the richest third of the population (SHCP (2006)), where informality is far less frequent.[8] Therefore, the large majority of the resources for a program financed by general tax revenues, like SP, comes from households in the formal labor market.

State governments are responsible for the administration of program resources, and they are free to choose the best use of the transfers they receive. However, states are constrained by the obligation to cover all the services and material contained in the program catalog. In practice, states have placed an emphasis on guaranteeing that there is an adequate supply of pharmaceutical material.

### 3.3 The SP Program Roll-Out

The ultimate objective of the SP program is to cover the 50 million individuals who are not covered by the Social Security segment of the health system. However, due to financial and infrastructure constraints, the program was not implemented across the entire country at once. Instead, it has been gradually rolled out since 2002. To determine the sequence in which the program is rolled out, the federal and state governments bargain at the end of each year over the target of households to be enrolled per state for every quarter (the targeted intensity of the program in each state) and over the regions in the state where enrollment in SP will be open to eligible households. Under the bargaining process, the states make proposals, but the federal government has the last word.

There is a statutory rule governing the roll-out process, which states that priority should be given to the poorest regions of the country, subject to minimum infrastructure requirements. In practice, other considerations have played a dominant role. One consideration is logistical: there are large fixed costs of offering the program to households in any given region; these costs derive from invest-

[8]There are about 25 million households in the country. From Table 1 it follows that essentially every household in the lowest decile is informal, and less than a third of all households in the top three deciles are informal.

ments in infrastructure and promotion/enrollment campaigns. Once they are met, the marginal cost per enrolled household is low, and it is efficient to enroll as many households in the region as possible.[9]

Political considerations also played a major role. They affected the program roll-out sequence in at least two ways. First, there is evidence that states with smaller populations received more program resources in the run-up to the 2006 presidential election. The political motivation for entering small states first is that full coverage could be achieved rapidly, and the federal government could point to these success stories. Second, states that were governed by the main opposition party (the left-wing PRD) were systematically allocated fewer program resources, despite having similar development indicators as states governed by the other main parties (the right-wing PAN, which controlled the federal government, or the center PRI).

When the entire eligible population in a state is covered by SP according to government estimates, the federal government organizes a ceremony in which the president raises a white flag (which is intended to represent health). In the run-up to the 2006 presidential election, the white flag was raised in five states. Table 2 shows these states in the order in which full coverage was achieved, their ranking in terms of poverty (as measured by GDP per capita and the Human Development Index computed by the UN Development Program) and in terms of population, and the political party governing the state at the time. States are ranked in ascending order: Colima has the 20th highest GDP per capita among the 32 states, and the second smallest population, Aguascalientes has the 24th highest GDP per capita and the 5th smallest population, and so on. The data do not suggest that poorer states received more program resources at early stages. The data do suggest that states with smaller populations, where full coverage was easier to reach, tended to receive more resources from the program early. Moreover, none of the states where full coverage was achieved before the 2006 election were governed by the left-wing PRD party.

I next show further evidence that political factors affected the program roll-out using the program intensity target as the metric of the program size. For each quarter of the 2002-2006 period, I obtained from program administrators the target of enrolled households by state. With these data, I constructed the SP program intensity target, which is defined as the ratio of the total number of households that the federal and state government agreed to enroll in a quarter and the total number of households not covered by Social Security in the state as of 2007 (the data on Social

[9] According to a program administrator, when the program team visits a village or a neighborhood, they attempt to enroll every household that is not covered by Social Security in order to reduce the costs of enrollment campaigns.

Security coverage by state is not available for previous periods).[10] The intensity target is equal to the fraction of SP-eligible households in a state that are intended by the government for SP enrollment in a given quarter. Figure 1 plots the program intensity target for every state for three periods (second quarters of 2004, 2005, and 2006), with states ordered in ascending order according to the intensity target in the second quarter of 2006. Note that for some states the intensity takes values higher than one, which suggests that the size of the program by state was not determined entirely by technical considerations.

Table 3 shows the mean program intensity target according to the political affiliation of the state government and also the mean poverty level, measured by the Human Development Index. There are three main political parties in Mexico: the right-wing PAN, the center PRI, and the left-wing PRD. The PAN had control of the federal government when the SP program was launched, and the 2006 presidential election was a two-way race between the right-wing PAN and the left-wing PRD. The data in Table 3 suggests that the differences in regional poverty among states governed by different parties do not justify the larger program intensities observed in states governed by PAN, especially for the last years.

The evidence shows that, possibly as a result of logistical and political factors influencing the phase-in process, the size of the program supply is uncorrelated with the level of economic development and health needs across different states. Figures 2 through 4 illustrate this for different measures of regional economic development. In Figure 2, poverty is measured by the proportion of households with access to piped water in a state: in Figure 3, poverty is measured by the proportion of households with a refrigerator. In both cases, there is no systematic correlation between poverty and program intensity for any of the three periods plotted. Figure 4 plots the program intensity target against the 2000 Human Development Index of each state, a comprehensive development indicator in which health status is a major component. Again, SP roll-out is uncorrelated with pre-period outcomes.

Summing up, while the phase-in sequence of the SP program was not random and I cannot fully account for all the factors that influenced it, logistical and political concerns seem to have driven the roll-out, and it does not seem to have depended on the health needs of states.

[10] The share of a state population covered by Social Security is very stable across time even for periods as long as five years. Given that the total population is growing for every state, the number of households not covered by Social Security in 2007 is larger than the corresponding number for previous years. Accordingly, the definition of intensity target could underestimate the actual program size by state.

# 4 The Effects of Health Shocks Prior to SP

This section provides background evidence about the effects of health shocks on the welfare and choices of households in Mexico before the program was implemented (or more precisely, when its presence was negligible). I quantify the magnitude of two main channels, increased health expenditure and reduced income, through which health shocks affect household welfare. I also test whether households covered by the non-SS segment of the health system are more vulnerable to the adverse effects of health shocks. This is informative about the extent to which a program like SP can increase the welfare of its beneficiaries.

I work with the 2003 and 2004 waves of the ENCEL Urbana, a household panel data set.[11] Enrollment in the SP program for this sample is extremely rare, and all of the results are unchanged if the few households enrolled are dropped. The ENCEL questionnaire includes questions about labor market outcomes, household expenditure, socioeconomic characteristics, and Social Security coverage (SP eligibility). It also contains information on health. Specifically, there is a set of questions on the ability of each adult to perform a series of tasks, typically referred to as activities of daily life (ADLs), and questions about the incidence of health problems during the last month. The information on ADLs can be used to construct an index that measures individual health status. The ADL index was first proposed by the RAND Medical Outcome Study, and there is a body of literature that highlights the advantages of measuring health with ADLs (See Gertler and Gruber (2002) and Strauss et al. (1995)). I can alternatively measure health with morbidity during the last month. The results from using either measure are qualitatively similar. I report only those from the ADL index. In the ADL index, a value of 0 means complete disability, a value of 1 signals complete ability, and intermediate values imply intermediate degrees of disability. See the Data Appendix for the definition of the ADL index and a more complete discussion.

Table 4 presents descriptive statistics for ENCEL Urbana sample. It was drawn from a universe of medium-sized cities with a high density of poor households. This accounts for the lower levels of income, expenditure, education, and Social Security coverage in comparison to the national surveys used in section 5 (see Tables 6 and 11).

In order to control for the time invariant unobservable characteristics of households that usually

[11] ENCEL Urbana was created to evaluate the expansion of the conditional cash transfer program PROGRESA into urban areas. Given that PROGRESA has an important health component, households in regions where this program was implemented do not provide a representative image of the typical household's response to health shocks. However, a control group was formed by matching at the region level, including approximately 3,000 households. I only use households in the control group. See Gertler (2004) for a complete description of PROGRESA.

confound the analysis of health-related variables, I estimate the effect of health shocks from variation in health status across time rather than from cross-sectional variation. I estimate equation (1), regressing the change of the outcome in interest over the 2003-2004 period on the change in the ADL health index over the same period, where the change in the ADL index is expressed in terms of its standard deviation in 2003. Therefore, the coefficient on $\Delta\mathbf{h}$ measures the response of the dependent variable to a one standard deviation change in the ADL index. The equation also includes a series of demographic controls[12] and is estimated only for household heads, because they are the main source of household income (all results are similar if the estimation is done with all the adults in the sample). Standard errors are clustered at the municipality level to account for regional shocks. Equation (1) estimates the average effect of health shocks for households. Equation (2) additionally includes an interaction between the change in the health index and **noSS**, a dummy that takes a value of one if the household is not covered by Social Security (and therefore is SP-eligible), as well as the **noSS** dummy.[13] The coefficient on the interaction between $\Delta\mathbf{h}$ and **noSS** represents the extent to which SP-eligible households are particularly hurt by health shocks; it can be thought of as measuring the need for the program.

$$\Delta\mathbf{y_i} = \alpha + \beta\Delta\mathbf{h_i} + \mathbf{X_i'}\gamma + \epsilon_i \tag{1}$$

$$\Delta\mathbf{y_i} = \alpha + \beta_\mathbf{1}\Delta\mathbf{h_i} + \beta_\mathbf{2}\Delta\mathbf{h_i}\cdot\mathbf{noSS_i} + \beta_\mathbf{3}\mathbf{noSS_i} + \mathbf{X_i'}\gamma + \epsilon_i \tag{2}$$

Table 5 contains the estimates. There are three panels. The top panel describes labor market outcomes for the household head. A positive coefficient implies that deteriorations in the health index are associated with reduced labor market outcomes. According to the point estimates, a reduction of one standard deviation in the health index is associated with a 4.5 percentage points reduction in the probability of labor force participation for the average household head.[14] The effect for SP-eligible (non-SS) households is larger than that for households covered by Social Security, although the standard errors increase substantially when the effect is broken down by eligibility status, and the difference is not significant. The regressions for hours worked per week and (the logarithm of) monthly labor income include observations with positive labor market participation only. They imply that household heads who suffer a deterioration of the health index but stay in the labor market reduce the hours they work and experience a decrease in labor income, although

[12] Controls include gender, age, marital status, education, and household size.

[13] For comparability, both specifications are estimated only for households that reported the same Social Security status in the two waves. Nearly 90% of the households in the sample satisfy this condition. The results for equation (1) are nearly identical with the full sample.

[14] The standard deviation of the ADL index in 2004 is 0.213. Assuming a linear relationship between the dependent variable and the health index over the entire range of the index, the effects of a change from complete ability to complete disability are about 5 times greater than those of a standard deviation change.

the estimates are imprecise. The effect on hours is similar for eligible and non-eligible households, while the effect on income is entirely driven by eligible households.

The second panel includes the response of health expenditure to health shocks. The negative sign of the coefficients implies that a deterioration in the health index is associated with an increase in health expenditures. Total health expenditure is broken down into two categories: primary care (outpatient care) and hospitalization. According to the point estimates, a one standard deviation deterioration in the health index is associated with an increase of 70 pesos in total health expenditure for SP-eligible households, or about 13% of mean per capita monthly non-health consumption (see Table 4). The point estimate for households receiving Social Security is not significantly different from zero and small in absolute value.[15]

The third panel shows the results for household per capita consumption. I examine the effect of health shocks on total monthly non-health expenditure and two subcategories: food and clothing expenditure. Total non-health and food expenditure are positive in both waves for almost every household in the sample.[16] Accordingly, I can work with logarithms and interpret the coefficients as percentage changes. On the other hand, many households report zero expenditure in clothing. To deal with this, I use the level of expenditure in clothing in the regression. Results for total non-health consumption appear in the first column. A one standard deviation decrease in the household head's health index is associated with a 2.2% reduction of per capita consumption, and this effect is marginally significant. The standard errors double or triple if the effect is estimated by SP eligibility status, but the point estimates indicate that the effect is entirely driven by SP-eligible households. The second and third columns show the results for specific subcategories. In the second column, food consumption decreases 2.5% in response to a one standard deviation decrease of the health index and the effect is much larger for non-SS households, although all the coefficients are insignificant. In the third column, clothing expenditure decreases when health decreases, but all the coefficients are insignificant.[17]

[15]These results are in contrast with those of Gertler and Gruber (2002) for Indonesia, who find that the effect of health shocks on labor supply is large, while their effect on health expenditure is small. The differences between their findings and mine are explained by the large differences in living standards between the two countries and by the rural nature of the Indonesian sample. On the other hand, Smith (1999) finds that, for a sample of US households, the onset of health problems is associated with small reductions in labor supply and large increases in out-of-pocket health expenditures.

[16]The fraction of households declaring zero expenditure in these categories is considerably smaller than 1%.

[17]In results not shown, I find that the debt stock of a household increases significantly when the health of the household head deteriorates. It is impossible to test the effects of the SP on debt levels given the lack of comparable data on household debt for the pre and post-program periods. However, there is suggestive cross-sectional evidence from the 2006 wave of the national health survey (ENSANUT) that the program is associated with SP-eligible

Health shocks can adversely affect the household budget through two main channels: the capacity to generate income decreases, and the need to devote resources to healthcare increases. The evidence in this section shows that both channels are relevant for Mexican households, and that households outside the formal labor market are particularly vulnerable to both: their labor supply decreases more, and their health expenditures increase more. If non-health per capita consumption is used as a measure of household welfare, the estimates suggest that, prior to SP, health shocks had large effects on household welfare, especially for households not covered by the Social Security segment of the public health system. Consequently, there is a ample room for the SP program to increase the welfare of the poorer households that are detached from the formal labor market.[18]

# 5 SP Program Effects

In this section, I estimate the effects of the SP program using the regional variation in the program intensity target induced by the phase-in sequence. The program intensity target is defined as the ratio of the number of households targeted to be enrolled in a quarter over the total number of households not covered by Social Security by state. It is equal to the fraction of SP-eligible households in a state that are intended by the government for SP enrollment in a given quarter. The intensity target is a measure of the size of the program supply by state. Figure 1 plots the program intensity target for every state for three periods (which correspond to the three post-program waves of the ENIGH-dataset). States are ordered in ascending order according to the intensity target in the second quarter of 2006. Some states reached high intensity levels early, while others reached high intensity levels only later on, and some states had low intensity levels throughout. Recall from section 3 that the state intensity target is uncorrelated with the initial level of economic development and regional health needs.

No single data set contains all the information necessary for the evaluation of SP's effects, so I work with two different data sets. First, I use the 2000 and 2006 waves of the national health survey (ENSA 2000 and ENSANUT 2006) to estimate the impact of SP on household responses to health problems, health expenditure, and health outcomes. Then, I use several waves of the national income-expenditure household survey (ENIGH) to derive an alternative estimate of the program's effect on health expenditure, as well as an estimate of the program's effect on labor market outcomes. The existence of several waves of ENIGH from the pre-program period allows a

households accumulating less debt to finance healthcare in the face of health problems.

[18] The evidence in this section also suggests that the government could further reduce the vulnerability of households to health shocks by complementing the health services of SP with some kind of income insurance scheme. Of course, this type of policy has the potential to generate large moral hazard problems.

series of falsification exercises to test the validity of the identification strategy. I complement the household level data of the two synthetic panels with demographic data at the locality level from the 2000 census.[19]

### 5.1 Responses to Health Problems: Utilization, Expenditure, Outcomes

I analyze the impact of the SP program on responses to health problems, expenditure on health, and health status using the 2000 and 2006 waves of the national health survey (ENSA 2000 and ENSANUT 2006 are their acronyms in Spanish). The national health survey is made up of several different questionnaires. I use three: one applied to every member of the household, one applied to a random sample of health services users, and one applied to all adults in the household. The household survey contains questions about self-perceived health, occurrence of health problems, and responses to these problems. Each wave has approximately 200,000 individuals. The health service users' questionnaire contains questions about visits to a health facility. The two rounds together contain slightly more than 20,000 individuals. The adult questionnaire contains a series of questions about health status as well as anthropometric information. There are around 45,000 adults in each round of the adult sample.

Table 6 presents the descriptive statistics for the ENSA/ENSANUT sample. The household questionnaire contains a question on whether each individual experienced a health problem in the last two weeks (the variable Morbidity takes a value of one when the answer is yes), and a set of questions related to the response to the health problem, including whether care from a health sector professional was sought (the variable "Seeks care" takes a value of one if care was sought in response to a problem) and, for those who did experience a health problem but did not seek care, whether they did so due to money concerns (if the response is yes, the dummy "Financial reasons" is equal to one). The household questionnaire also contains a question on perceived health that uses a five category scale (ranging from very poor to very good), which I convert to an index that takes values between 0 (very poor) and 1 (very good). It also contains questions on the disability status of each member, although these questions are not as precise as those on ADLs.[20]

For a random sample of those individuals who did seek care after experiencing a health problem,

[19]The locality is the smallest geographic unit with demographic data available. Variables from the census include total population and shares of total population in the following subgroups: over 18 years of age, SP-eligible (not covered by Social Security), born in locality, with some type of disability, indigenous, and with access to a series of durable goods and public services.

[20]See the Data Appendix for a more complete discussion of the questions on disability in the National Health Survey.

an additional questionnaire is applied, with questions about their expenditures in primary care (broken down into medical services and medicines), the type of provider, and whether their health improved as a result of the visit to the doctor (if the response is yes, the dummy "Health improved" is equal to one). Unfortunately, the data on hospitalization episodes are not comparable across the different cross sections. Therefore, I will not be able to say anything about expenditure on hospitalization.

Finally, there is a questionnaire applied to all the adults in the household. It contains anthropometric measures (including blood pressure), and a set of questions on chronic conditions. In particular, for hypertension each adult is asked if she/he has been diagnosed with the problem, whether she/he receives treatment, and who provides the treatment for her/him.

According to the descriptive statistics in Table 6 corresponding to the 2000 and 2006 waves, 13% of the individuals experienced a health problem in the previous two weeks (Morbidity), out of which 60% sought medical care ("Seeks care"), and 9% did not seek medical care due to a financial reason (e.g. it was too expensive, I do not have enough money). Of those seeking care in response to health problems, about half do not spend out of pocket. The mean expenditure among individuals spending a positive amount is approximately 10% of total household monthly income, and 80% report that their health improved ("Health Improved"). Among adults, 33% have hypertension. Obesity and cardiovascular diseases have become prevalent public health problems in middle-income countries during recent decades (Bongaarts, Casterline, and McNicoll (2003), Case and Menendez (2007)). This is especially true for the case of Mexico (Fernald et al. (2004)).

I estimate the impact of the SP program by comparing households with and without Social Security in states with different levels of the program intensity target at different times. A comparison between households enrolled in the program and households that did not sign up for the program would be problematic, as enrollment in the program can be correlated with unobservable household characteristics that affect household behavior. Thus, I compare individuals in states with high program intensity targets to individuals in states with low intensity targets (an intention-to-treat approach). Different levels of the program intensity target across different states could simply reflect omitted variables that differ between the households living in different states. To deal with the time-invariant differences between households in different states, I estimate the program effects from the change of the outcome of interest over time, rather than from the level of the outcome. It is still possible that the states that had larger program intensities were already on different trajectories from those that had low intensities. My approach addresses this by looking specifically at how the trajectories differ for households not covered by Social Security and those covered by

Social Security. This strategy works if households covered by Social Security are not affected by the size of the program in their state.

Formally, I estimate the program's effect with a triple-difference approach, taking differences over targeted state intensity (measured at the time of the second cross section, first quarter of 2006), over time (pre vs post-program cross section), and over individual SP eligibility (SS vs non-SS).[21] The estimation strategy is represented by equation (3), where the outcome of interest is regressed on the triple interaction between the post-program period, individual SP-eligibility status (i.e. not covered by Social Security), and state program intensity, as well as the three pairs of double interactions, each component of the interaction separately, a set of individual covariates (years of education, household monthly income, gender, and household size), and a set of locality level controls from the 2000 census. The subindexes refer to the individual (**i**), the state (**j**), and the year (**t**). The standard errors are clustered at the state level, there are 32 states.

$$\begin{aligned}\mathbf{y_{ijt}} = \beta_1 \cdot \mathbf{Target_{j20061}} + \beta_2 \cdot \mathbf{noSS_i} + \beta_3 \cdot \mathbf{D2006_t} + \beta_4 \cdot \mathbf{Target_{j20061}} \cdot \mathbf{noSS_i} + \\ + \beta_5 \cdot \mathbf{Target_{j20061}} \cdot \mathbf{D2006_t} + \beta_6 \cdot \mathbf{noSS_i} \cdot \mathbf{D2006_t} + \\ + \beta_7 \cdot \mathbf{Target_{j20061}} \cdot \mathbf{noSS_i} \cdot \mathbf{D2006_t} + \mathbf{X'_{ijt}} \cdot \gamma + \epsilon_{ijt} \qquad (3)\end{aligned}$$

The effect of the program is measured by $\beta_7$. Given that equation (3) uses the program intensity target rather than the effective intensity (which additionally depends on program take-up by households), it yields intention-to-treat estimates. The intensity target for state **j** can be interpreted as the probability of a household not covered by Social Security living in state **j** of being intended for treatment. It takes a value of one when the number of households targeted to be enrolled is equal to the number of households not covered by Social Security in a state. The coefficient on the triple interaction can therefore be interpreted as the effect of full intended SP coverage. The program effect is estimated consistently by $\beta_7$ under the assumption that program intensity target is uncorrelated with time varying shocks that affect eligible (i.e. non-SS) and non-eligible (i.e. SS) individuals in a state differently. In other words, the specification allows for time invariant differences across states, and also for time variant differences that are common across individuals with and without Social Security within a state.

[21] This estimation strategy implicitly assumes that Social Security status is predetermined. This is seemingly a realistic assumption for the large majority of households. In a subsequent section of the paper, I investigate whether households have responded to the program by switching from the formal to the informal labor market to become SP-eligible, and find evidence that they have not.

The first column of Table 7 presents the estimates of equation (3) for program take-up. The dependent variable is a dummy for whether the household reports being enrolled in SP. The coefficient implies that a one unit increase in the intensity target in a state is associated with a 0.34 increase in the probability of SP enrollment for a household not covered by Social Security. Through the rest of the paper, I will report the intention-to-treat effects of the program, measured by $\beta_7$. The coefficient on the program take-up dummy implies that the treatment-on-the-treated effect can be calculated by multiplying the intention-to-treat estimate by 2.94 (=1/0.34).

Columns (2) to (7) of Table 7 show the estimates of equation (3) for a set of variables that measure responses to health problems. The estimate in column (2) implies that the SP program has no effect on the probability of experiencing health problems. At baseline, SP-eligible households were 12.5 percentage points less likely than households covered by Social Security to seek care when they faced a health problem. The effect of the SP program has been to close 50% of the original gap, although the point estimate is not significant. Similarly, SP-eligible households at baseline were 10.4 percentage points more likely than Social Security households not to seek care due to financial concerns and according to column (4) the effect of SP has been to close this gap by about 40% (4.2 percentage points reduction over the initial 10.4 percentage points difference). The estimates in columns (5) and (6) show that SP-eligible households have shifted from private providers (reduction of 17.5 percentage points) to the public facilities through which the SP program delivers care (10 percentage points increase). Finally, the last column shows that the program has not affected the outcome of visits to a health facility: there is no effect on the probability of reporting that the health of the user improved as a result of the visit. The evidence in Table 7 suggests that the SP program has caused both increased demand for curative services and a substantial substitution of private services by public services.

Table 8 shows results for health expenditure, broken down by services, drugs, and total primary care (which is the sum of services and drugs). The effect of the SP program has been to reduce the probability of a positive expenditure on primary care and to decrease the intensive margin as well. These results are consistent with the evidence of a substitution from private providers to public providers.

One specific health outcome for which there are good data in ENSA is hypertension. Table 9 shows the results on the prevalence and treatment of hypertension. The first column uses an anthropometric measure: the dependent variable is a dummy for having levels of blood pressure above the threshold for hypertension (systolic pressure above 140 or diastolic pressure above 90). The point estimate suggests no program effect on the probability of having this condition. The rest of the

columns use self-reported information. According to the estimate in the second column, the program has resulted in a decreased probability of being diagnosed with hypertension by a physician. These two results together suggest that the quality of the services offered by SP may be lower than that of the private providers from which beneficiaries are shifting. Conditional on having been diagnosed, the program has no significant effect on the probability of being treated. However, the program has resulted in a very large shift in treatment provider among the SP-eligible population: there is a large (the coefficient is larger than 20 percentage points) increase in the probability of individuals diagnosed with hypertension receiving treatment from the public system, accompanied with an almost identical decrease in the probability of treatment coming from a private provider.

Finally, Table 10 shows the results for measures of overall health status. The first three columns explore the effect of the program on perceived health. Individuals are more likely to say they enjoy good or very good health and less likely to say their health is poor or very poor. The effect is very modest, as shown by the fact that, when self-perceived health is expressed as an index that ranges from 0 to 1, the program effect is an increase of only 0.02 units (less than one tenth of a standard deviation). Results for the index constructed with the survey questions on disability (lower index values associated with more disability) point in the same direction: the effects of the program on health status are, at most, modest. Summing up, the results in Table 10 suggest that the SP program did not result in an improvement of health outcomes for the eligible population, or that, if there was an effect, it was very small. It should be noted that the initial differences between SS and non-SS households in terms of self-reported measures of health were very small as well (see Table 6).

The results in this subsection provide evidence that the SP program has resulted in a very large substitution from private providers into the public non-SS system. Consistent with this shift to public providers, SP has largely reduced health expenditure of eligible households. In other words, the evidence shows that the program represents a very substantial improvement in insurance against the increase in health expenditure caused by health shocks. On the other hand, the estimates suggest that health shocks are not treated more effectively, and that the quality of the services is not superior to that of the private providers from which beneficiaries shift. The results also suggest that the effects of the program on health status are modest at best.

### 5.2 Health Expenditure

I complement the ENSA/ENSANUT results using the 2000, 2004, 2005, and 2006 waves of the national income-expenditure survey (ENIGH is its acronym in Spanish).[22] ENIGH contains de-

[22]The program began to operate in a pilot version during the 2001-2002 period. Unfortunately, there is little information regarding the rules governing its operation during this period and its programmed intensity by state. I

tailed information about household expenditure (health-related and non-health related) as well as labor market outcomes for all adults. There are some differences between the measures of health expenditure in the two surveys. The variable in ENSA/ENSANUT measures expenditure on health services sought in response to a health problem, i.e. curative expenditure. The variable in ENIGH refers to all the expenditure on primary care, regardless of whether the household experienced a health problem. I attempt to make the results from the two surveys comparable by constructing the health expenditure variable from ENIGH in a way that replicates the ENSA variable as closely as possible. Thus, I exclude from primary care pregnancy, childbirth and weight-control related expenditures. However, the fact that there is no information about the health status of household members in ENIGH means that health expenditure will necessarily be more comprehensive, and include preventive care expenditure to some extent. Another difference refers to the recall periods. Whereas ENSA/ENSANUT only records health expenditure during the past two weeks, all the expenditure categories in ENIGH refer to the last quarter.

Table 11 presents the ENIGH descriptive statistics for the full sample and for the baseline year (2000). For the full sample, about half of all households (44%) spend a positive amount of money on primary care during the quarter: conditional on spending, the mean amount is about 1,000 pesos, roughly 20% of mean per capita quarterly non-health consumption. ENIGH does contain information about expenditure on hospitalization episodes. They are a rare occurrence, as reflected by the fact that in a quarter only 2% of households spend any amount on them. But for households that spend a positive amount, the mean is almost equal to mean per capita non-health consumption (5,480 pesos). However, since the sample of households with some spending on hospitals is extremely small, all the estimates involving this type of expenditure are very imprecise. Accordingly, they will be omitted from the subsequent tables, and my analysis will not speak to the effect of the SP program on hospital expenditures. According to the descriptive statistics, most household heads participate in the labor market, and about one third of them (37%) have a formal sector job. The corresponding percentage for other household members is similar (32%). Since almost 50% of households are covered by Social Security (the mean of "non SS" is 0.505) this implies that there are a large number of households with members working in the formal and informal sectors simultaneously. This could be part of a sensible strategy to get Social Security coverage (all the members in the household are covered if one member has a formal sector job).

The empirical strategy to estimate the SP program's effects with ENIGH data is represented by equation (4). It is very similar to the strategy represented by equation (3), but there are some minor differences. Given that there are multiple ENIGH waves corresponding to the post-program period,

deal with this problem by omitting the 2002 wave of ENIGH from the analysis.

targeted intensity varies over time for a state. Accordingly, the triple-difference equation contains a state fixed effect, represented by $\alpha_j$, a time fixed effect, represented by $\delta_t$, a dummy for individual SP-eligibility, represented by **noSS**, the interaction of each fixed effect with the eligibility dummy, the target for the relevant state-period, and its interaction with eligibility. The model could be more general if the program target was replaced by state-year fixed effects. All the results in the paper are insensitive to this change in the specification, so I will use the simpler version represented by equation (4). The effect of the program is measured by $\beta_5$. All the estimations include a set of demographic controls (see Table 11) and locality level variables from the 2000 census. The standard errors are clustered at the state level.

$$\begin{aligned}\mathbf{y_{ijt}} = \alpha_j + \delta_t + \beta_1 \cdot \mathbf{noSS_i} + \beta_2^{\mathbf{j}} \cdot \mathbf{noSS_i} \cdot \mathbb{1}_{\mathbf{j}} + \beta_3^{\mathbf{t}} \cdot \mathbf{noSS_i} \cdot \mathbb{1}_{\mathbf{t}} + \\ + \beta_4 \cdot \mathbf{Target_{jt}} + \beta_5 \cdot \mathbf{Target_{jt}} \cdot \mathbf{noSS_i} + \mathbf{X'_{ijt}} \cdot \gamma + \epsilon_{ijt} \end{aligned} \tag{4}$$

Table 12 displays the results of equation (4) for health expenditure. The estimates imply a large and significant reduction in the extensive margin and a negative but imprecisely estimated effect on the intensive margin. In this sense, they are similar to the results in Table 9, although the point estimates are smaller here. This difference can be interpreted as evidence that the SP program is particularly effective in reducing curative care expenditure, since the effect is smaller on the expenditure reported in ENIGH, which includes curative and preventive care, than on the expenditure reported in ENSA, which measures curative care only.

### 5.3 Robustness Checks

In this subsection, I perform a series of robustness checks using the ENIGH data. The existence of several waves from the period before the implementation of the program started makes it possible to estimate an equation similar to (4) with data from two pre-program periods and a measure of future program intensity as a placebo test. Equation (5) illustrates this for the 1998-2000 waves with a measure of program intensity corresponding to the first post-program wave of ENIGH (second quarter of 2004). A finding of significant "program effects", measured by $\beta_7$, would suggest that the estimates of equation (4) actually measure something other than the SP effect. Table 13 shows the results. None of the coefficients is significant, and the point estimates are actually positive. This provides evidence that the results above do not reflect a decreasing pre-existing trend in health expenditure in those states that subsequently received high program intensity targets.

$$\mathbf{y_{ijt}} = \beta_1 \cdot \mathbf{Target_{jT}} + \beta_2 \cdot \mathbf{noSS_i} + \beta_3 \cdot \mathbf{D2000_i} + \beta_4 \cdot \mathbf{Target_{jT}} \cdot \mathbf{noSS_i} +$$
$$+\beta_5 \cdot \mathbf{Target_{jT}} \cdot \mathbf{D2000_i} + \beta_6 \cdot \mathbf{noSS_i} \cdot \mathbf{D2000_t} +$$
$$+\beta_7 \cdot \mathbf{Target_{jT}} \cdot \mathbf{noSS_i} \cdot \mathbf{D2000_t} + \mathbf{X'_{ijt}} \cdot \gamma + \epsilon_{ijt},$$
$$\mathbf{t=1998,\ 2000},\ \ \mathbf{T=2004\text{-}q2} \tag{5}$$

As an additional robustness check, I estimate equation (4) for two sub-samples of households that are likely to have particularly acute health needs: households with at least one child under 5 years of age, and households with at least one member over 60 years. Results are shown in Table 14, together with the results for the entire sample. For households with children, the coefficient on the extensive margin dummy is -0.20, which is about twice as large in absolute value as that for the entire sample. For households with old members, both coefficients are negative and substantially larger in absolute terms.

Finally, in results not shown, I estimate equation (4) excluding one state at a time from the sample and find the results are quantitatively unchanged.

### 5.4 Non-Health Consumption

The SP program caused a reduction in health expenditure by beneficiary households. In this sub-section, I analyze how the households used the additional resources freed by the program benefits. (Note that the program might also change a household's resources through effects on labor income, but, as discussed in the next sub-section, this did not happen in practice.)

Table 15 shows the estimates of equation (4) for three outcomes related to various categories of household expenditure. In the first column, the dependent variable is budget share of primary care, defined as the ratio of primary care expenditure to total household expenditure. For ease of interpretation, the budget share ranges from 0 to 100. At baseline, households not covered by Social Security devoted 1 percentage point more of their budget to primary care than households covered by Social Security. The effect of a one unit increase in the SP intensity target is a reduction of 1.27 percentage points in primary care's budget share. On the other hand, estimating equation (4) for total expenditure yields insignificant estimates (results not shown). This suggests that beneficiary households used the resources they saved from health to consume other types of goods.

In column (2), the dependent variable is the level of health expenditure. According to the estimates, the SP program is associated with a 363 pesos decrease in health expenditure. This is equivalent to 1.7% of mean non-health consumption. In column (3) the logarithm of per capita non-health expenditure is the dependent variable. According to the estimates, the SP program is associated with a 2.3% increase in non-health consumption. The coefficient for non-health consumption is not significant, but a comparison of the point estimates in columns (2) and (3) suggests that the decrease in health expenditure is similar to the increase in non-health expenditure.

In results not shown, I also estimated the program's effects for specific categories of non-health consumption. The estimates are very imprecise, and they are extremely sensitive to small modifications in the specification. This is not too surprising. Health represents a relatively small fraction of total expenditure for most households, so that even large percent reductions in health expenditure lead to only small increases in other types of consumption. Additionally, measurement error is a prevalent problem in expenditure data. In any case, the evidence does not allow one to determine precisely how households are spending the additional resources that are freed up by the program. What the evidence does say is that households are using the additional resources to consume more (non-health related) goods, rather than to save more.

### 5.5 Labor Market Outcomes

This section explores the effect of SP on labor market outcomes. Two aspects of the labor market are particularly relevant. The first one is the impact of SP on labor supply decisions by household members. The second is the program's impact on the choice of employment sector. When a household has the option to enroll in the SP program, a job in the informal sector becomes more attractive relative to a formal job, since some of the benefits that were previously exclusive to formal sector jobs become accessible for workers in the informal sector. With mobility of workers between the formal and the informal sectors, the introduction of SP could result in a shift of workers from the formal sector to the informal sector. Given the evidence for Mexico on the high mobility of workers in the two directions between the formal and informal sector (Maloney (1999), Gong et al. (2004), Maloney and Bosch (2006)), there is a concern that SP could cause movement of workers to the informal sector and a related reduction in aggregate productivity (Levy (2008)).

Table 16 shows the estimates of the impact of the program on labor supply outcomes, broken down by the position of the individual in the household (head and other members). All of the specifications include the demographic and the locality-level controls, as well as a set of dummies for 10-year age groups. The program effects for labor force participation and hours worked, estimated with equation (4), are both insignificant. For the two groups, the point estimate for labor force

participation is positive, while that for hours worked is negative. The evidence cannot reject the null hypothesis that SP has no effect on the labor supply of beneficiaries. The SP program could affect work effort outcomes through two channels. First, healthier individuals could work more. Second, there is an income effect from the reduced household expenditure on health. Given the findings in the previous sections that the SP program does not affect the health status of individuals or the final outcome of visits to a health facility, the improved health channel is not strong in this context. The estimates in Table 16 suggest that the income effect, too, is negligible.

Up to this point, I have used a triple-difference equation to estimate the effects of SP, taking differences over time, state intensity target, and Social Security coverage (which depends on whether the individual or someone in the household holds a formal job). This specification identifies the effects of the program on the assumption that Social Security coverage among the population in a region is not affected by the regional intensity of SP. In Table 17, I explore whether this assumption holds in the data. In the first and third columns of the Table, I directly test the hypothesis that SP is associated with a flow of workers to the informal sector by using a dummy variable for holding a job in the formal sector as the dependent variable. In this case, the empirical strategy is slightly different. Given that eligibility for SP depends on an individual and other members of his household not working in the formal sector, I use a double-difference estimator –taking differences over time and state targeted intensity– rather than the triple-difference estimator –that additionally takes differences over SP eligibility– used for the rest of the outcomes. This equation is estimated only for individuals who work. Additionally, I include a set of fixed effects for the characteristics of the job that the worker holds (type of contract, size of firm, economic sector of firm, position within firm, occupation). The estimates are not significant. The standard errors are reasonably small; for household heads, any change in the probability of holding a formal job larger than 3.3 percentage points in absolute value would be significant. Moreover, the point estimates have the wrong (positive) sign, which would indicate that the program is associated with a flow of workers out of the informal sector.

Columns (2) and (4) of Table 17 present the results of an alternative test of the hypothesis that SP caused a shift of workers between sectors. As long as the demand for informal workers is not perfectly elastic, a flow of workers to this sector should lead to a decrease in the wage of informal workers relative to that of formal workers. To see if this is the case, I employ a triple-difference equation (taking differences over state targeted intensity, time, and whether a worker is informal) with (the logarithm of) the hourly (net of taxes) wage as the dependent variable. This specification also includes the fixed effects for job characteristics.[23] Consistent with the findings of no program

[23]This equation is estimated only for workers that report a positive labor income.

effects on labor supply and sector of employment, the estimates for the hourly (net of taxes) wage are not significant. Although the standard errors are large, the point estimates are very close to zero in absolute value. For the two groups considered, they imply that the effect of full SP coverage in a state on the relative wage is smaller than 1%.

Figure 5 presents additional evidence that the introduction of SP is not associated with a reduction of the relative wage of informal sector wages. To construct it, I estimate the wage gap between workers in the informal and the formal sector for each state in each year (2000, 2004, 2005, and 2006) with a regression of (the logarithm of) hourly wages on a dummy for informality, fixed effects for the characteristics of the job, and the demographic controls. Then, for each state and each year after the program was introduced (2004, 2005, and 2006), I subtract the 2000 wage gap to get the "change in the wage gap" over time. Finally, I plot this change against the state targeted intensity in the after period. If SP had caused a shift of workers to the informal sector and a reduction in the wage of informal sector workers, we would expect the wage gap to have decreased more for those states that received higher program intensities. In other words, the points in Figure 5 should be clustered around a negative slope. Clearly, that is not the case. Results are qualitatively similar using a bias-adjusted matching method (Abadie and Imbens (2002)) to estimate the wage gap between workers in the informal and the formal sector.

The findings that the SP program did not cause a shift of workers to the informal sector are somewhat puzzling in light of the evidence about the mobility of workers across sectors in Mexico, and in view of the results showing that the program is associated with a substantial reduction of household expenditure on health. There are several potential explanations. First, it is possible that households need more time to adjust their labor market decisions. If this was the case, the full effects of the program would take more time to be apparent and a longer time frame would be needed for a complete evaluation.

The quality of the healthcare services offered by SP could also be part of the explanation for the lack of movement into the informal sector. The literature on in-kind redistribution highlights the importance of the quality of the goods transferred for the effects of this type of policy. Besley and Coate (1991) propose a model in which the government can redistribute income towards the poor by universally providing a private good, the production of which is financed with general taxes. The key for this policy to redistribute income to the poor effectively is that the quality of the good must satisfy an incentive compatibility constraint, which guarantees that high income agents prefer to buy a higher quality version of the good with their money while poor agents prefer to take the low quality version that the government offers. In a related paper, Akerlof (1978) shows that

the tradeoff between redistribution and efficiency can be improved if individual characteristics that are common in poor sectors of the population are identified and transfers are made conditional on those characteristics (if agents can be tagged). The costs of redistribution depend critically on the incentives that agents face to alter their characteristics in order to belong to the group receiving the transfers.

The 2006 wave of ENSANUT contains the following question: "If healthcare services were free, which institution would you choose?" Table 18 shows the percentage of the responses corresponding to each institution, broken down by the Social Security coverage of the individual. While the heterogeneity in the responses is somewhat surprising, a clear pattern is that a large majority of non-SP-eligible individuals prefer either the Social Security network or a private provider to the SP services. Indeed, only about 1 in 10 of the individuals covered by Social Security would choose the SP services over other choices. The quality of the services offered by the SP program may be such that the higher income sectors of the population with access to Social Security prefer to pay pay-roll taxes and have access to Social Security services, or to pay for a private provider, than to use SP services. In other words, if SP is regarded as an in-kind transfer scheme, it is possible that it satisfies an incentive compatibility constraint; the program's relatively low quality healthcare made it not worthwhile to switch into the informal sector in response to SP.

# 6 Conclusion

In 2002, the Mexican government began to implement a major program to improve healthcare services for half of the country's population, those detached from the formal labor market (and, therefore, not covered by Social Security institutions). In this paper, I estimate the effects of the reform using the spatial variation in program coverage induced by the sequential roll-out and comparing households that are SP-eligible to those that are not. I find that the program did not result in improved health outcomes. Closely related, labor supply for program beneficiaries did not change. Thus, the evidence suggests that the SP program did not cause an increase in investment in human capital. However, the program did result in a shift from private providers to public providers of health services by eligible households and an associated substantial reduction in household health-related expenditure. As SP is financed by general taxes that are mostly paid by households in the formal sector, it had a redistributive impact. The amount of resources that state and federal governments devote per year to the program for each enrolled household (7,994 pesos) is equal to 8% of the mean yearly household income in the ENIGH sample. According to the treatment-on-the-treated estimates for the program effect on household health expenditure, each dollar that the government devoted to the SP program resulted in savings for households of

0.53 dollars (the intention-to-treat estimate for the level of quarterly health expenditure is 363 pesos, implying a yearly treatment-on-the-treated effect of 4,271 pesos). Households used the 4.2% increase in their budget to consume more.

During recent years, several middle-income countries have implemented social policy programs that successfully combine redistribution towards poor households with increased investment in human capital. Cash transfers to poor households conditional on their children attending school are a prime example: Mexico's PROGRESA-OPORTUNIDADES is a pioneer among these type of programs. From this perspective, it is hard to offer a positive appraisal of the SP program, since it did not achieve the program goal of improving the health status of beneficiaries.

On the other hand, in spite of the evidence about the mobility of workers between the formal and the informal sectors in Mexico, the redistribution implemented by SP did not lead to an increase in the size of the informal sector. It is possible that the the low quality of care provided under SP, while reducing the effects of the program on human capital (health), may have prevented the unintended consequence of encouraging movement into the informal sector. In the literature on in-kind transfers, the incentive compatibility constraint plays a key role. For this type of policy to redistribute income towards the poor effectively, the quality of the goods transferred by the government must be such that rich households are not attracted. There is evidence that the vast majority of the Mexican households covered by Social Security prefer Social Security and private providers to the SP services. This may explain why we do not observe a flow of workers to the informal sector. It could also imply that there is room for the government to engage in more redistribution, in the form of improved quality of the SP services, without causing significant distortions.

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# 7 Data Appendix

## 7.1 The ADL Index

The ENCEL questionnaire includes detailed questions about the ability of each adult member to perform a series of activities, related to basic needs (bathe oneself, clothe oneself), light efforts (carry grocery bags for 0.5 km.), medium efforts (sweep the floor, lift a baby, walk 5 km.), and big efforts (carry heavy objects, play soccer, wash clothes). Possible responses are that an individual can do an activity easily, can do it but with difficulty, or is unable to do it.

As a measure of health status I use the ADL index, which was developed by the RAND Medical Outcome Study (Stewart et al. (1990)). Under this index, a value of 3 is assigned to an activity that can be done easily, a value of 2 if it can be done with difficulty, and a value of 1 if it cannot be done. Then, these values are added into a score to form the index below, where a value of 0 signals that an individual -indexed by i- is unable to perform any of the activities and a value of 1 that the individual can perform all activities with no difficulties.

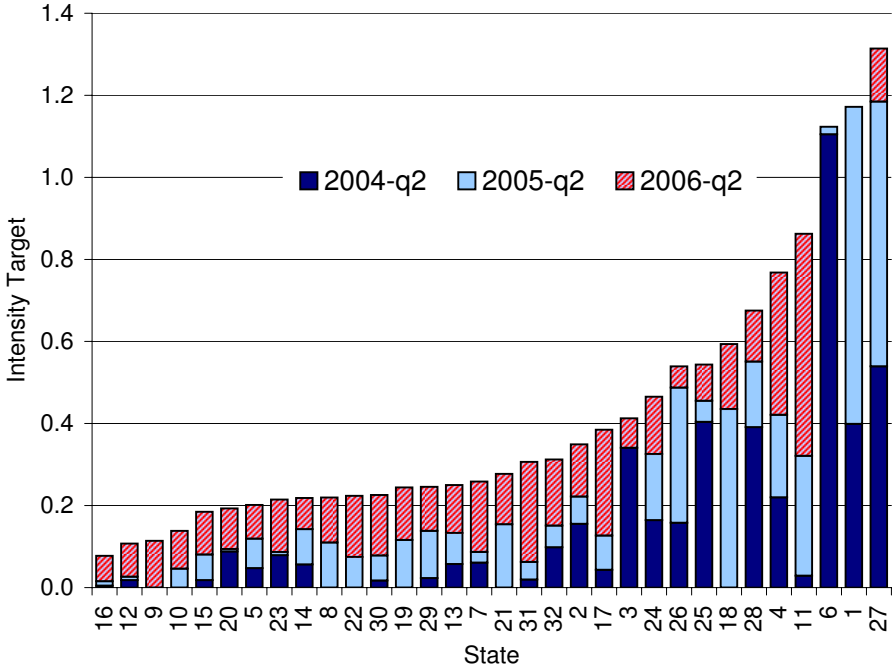
$$\mathbf{h_i} = \frac{\mathbf{Score_i - Min.\ Score}}{\mathbf{Max.\ Score - Min.\ Score}}$$

## 7.2 Disability Information in the National Health Survey

The National Health Survey includes two questions about disability. Each individual is asked whether she or he has difficulties or limitations to move or walk and use her hands and arms. For each question, a value of 0 is assigned if the individual has difficulties, and a value of 1 if she does not have difficulties. Then the values for the two responses are added to form an index where zero means limitations for the two types of activities and a value of 1 implies no limitations for any of the activities.

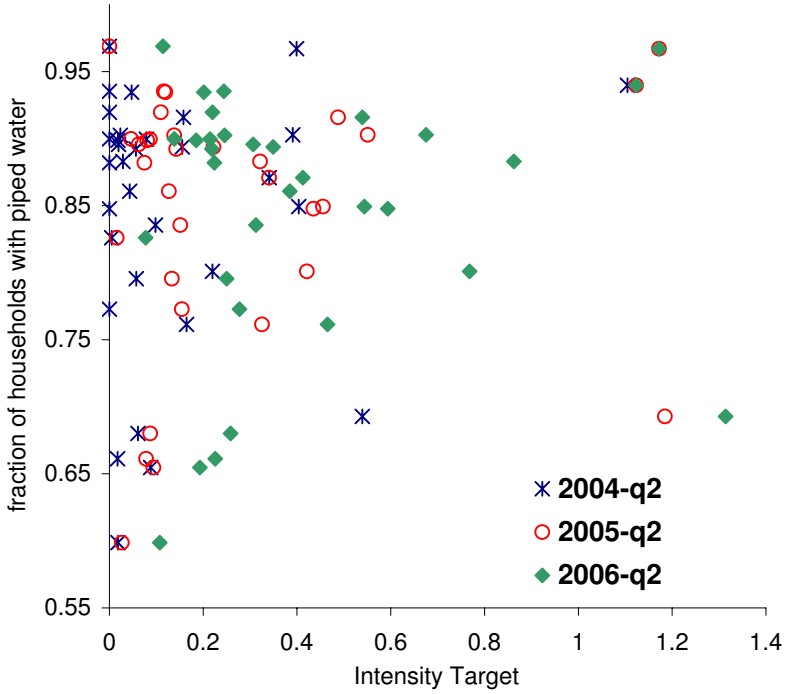
# 8 Figures and Tables

**Figure 1: Program intensity**



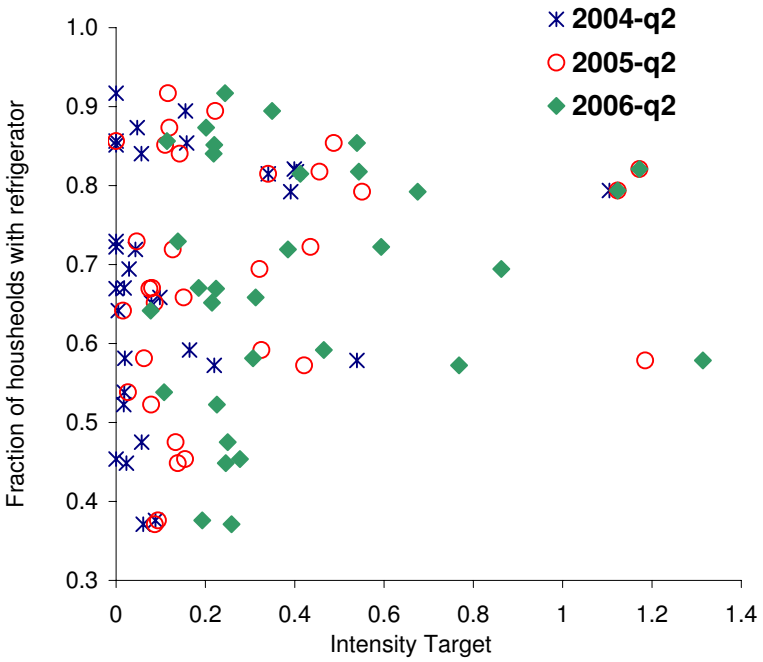

The intensity target is the ratio of the number of individuals targeted to be enrolled by quarter and the number of individuals not covered by social security by state in 2007. States sorted according to intensity target in the second quarter of 2006. The state identifiers are assigned in alphabetical order. The bars are not stacked; each bar starts at the x axis.

**Figure 2: Program intensity vs fraction of households with piped water**



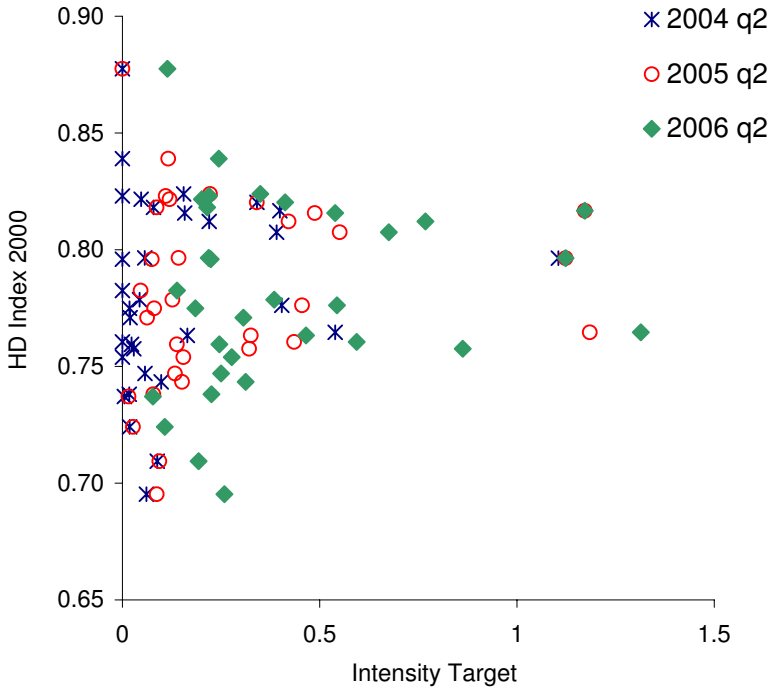

The program target is the ratio of the number of individuals targeted to be enrolled by quarter and the number of individuals not covered by social security by state in 2007. Fraction of households in state without access to piped water in 2000 census.

**Figure 3: Program intensity vs fraction of households with a refrigerator**



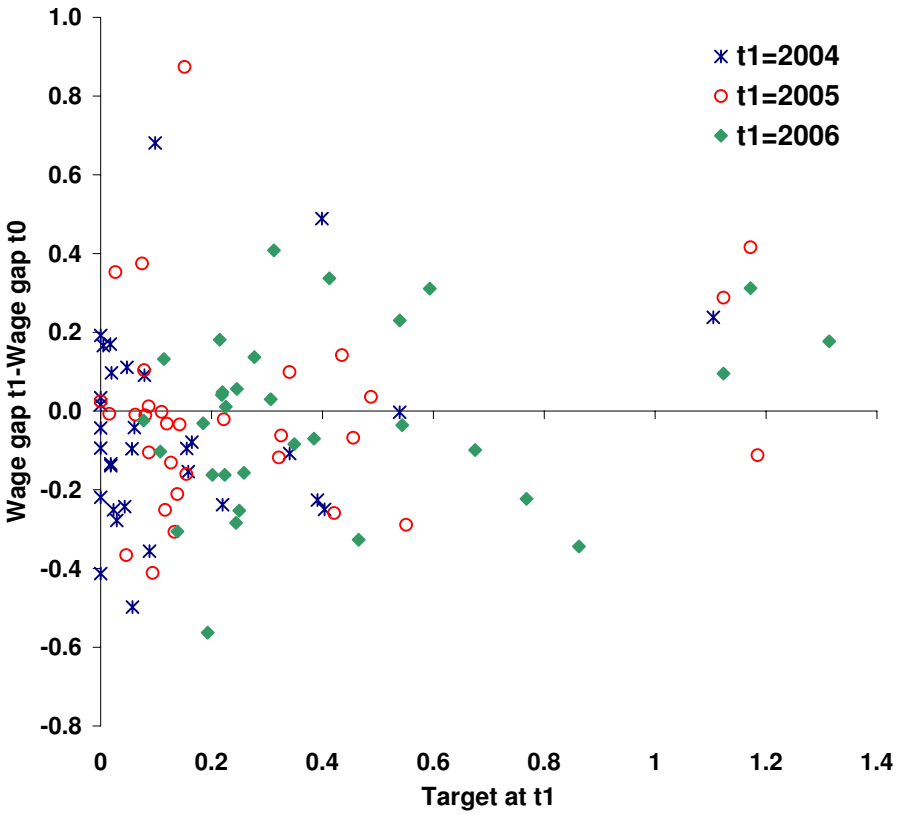

The program target is the ratio of the number of individuals targeted to be enrolled by quarter and the number of individuals not covered by social security by state in 2007. Fraction of households in state with a refrigerator in 2000 census.

**Figure 4: Program intensity vs human development index**




HD: Human Development index (UNDP). The program target is the ratio of the number of individuals targeted to be enrolled by quarter and the number of individuals not covered by social security by state in 2007.

**Figure 5: Change in formal-informal wage gap**




Wage gap for each year estimated with a regression of the logarithm of the wage per hour on a dummy for informality, demographic and locality-level controls, and a set of fixed effects for job characteristics. The intial period (t0) is 2000 in every case, the final period (t1) takes 3 values: 2004, 2005, and 2006.

**Table 1: SP beneficiaries, eligible households and fees, 2006**

| Income decile | Households enrolled in SP | Non SS households (eligible for SP) | Quarterly fee* | Beneficiaries paying zero (%) |
|---|---|---|---|---|
| 1 | 523,082 | 2,589,608 | 0 | 100.0 |
| 2 | 521,438 | 2,318,498 | 0 | 99.5 |
| 3 | 488,151 | 2,002,232 | 160 | 99.7 |
| 4 | 377,423 | 1,713,776 | 314 | 97.7 |
| 5 | 361,676 | 1,489,577 | 465 | 98.0 |
| 6 | 265,543 | 1,291,398 | 635 | 99.3 |
| 7 | 230,483 | 1,130,711 | 818 | 98.6 |
| 8 | 174,651 | 936,458 | 1,266 | 97.3 |
| 9 | 112,615 | 725,538 | 1,685 | 99.4 |
| 10 | 59,939 | 694,687 | 2,550 | 97.9 |

Source: author's calculations based on ENIGH 2006. *In pesos according to program rules. Non SS are households not covered by Social Security.

**Table 2: States with full coverage of SP-eligible households before 2006 election**

| State | Date achieved | Rank GDP per capita* | Rank HD index* | Rank population* | Share of national population (%) | Political party |
|---|---|---|---|---|---|---|
| Colima | Oct-04 | 20 | 20 | 2 | 0.55 | PRI |
| Aguascalientes | Apr-05 | 24 | 25 | 5 | 1.02 | PAN |
| Campeche | Nov-05 | 30 | 23 | 3 | 0.73 | PRI |
| Tabasco | Jan-06 | 10 | 13 | 13 | 1.94 | PRI |
| Guanajuato | Feb-06 | 13 | 9 | 27 | 4.77 | PAN |

*Rank in ascending order, i.e. a lower number means lower GDP or population. There are 32 states in Mexico. Political party refers to the affiliation of the state government. There are three main parties in Mexico: the right-wing PAN (which controlled the federal government during this period), the center PRI, and the left-wing PRD.

**Table 3: Program intensity target and human development index by political party in State Government**

| | Mean Intensity Target | | | Mean Human Development Index | | |
|---|---|---|---|---|---|---|
| Governor | PAN | PRI | PRD | PAN | PRI | PRD |
| 2003 | 0.06 | 0.06 | 0.01 | 0.77 | 0.77 | 0.82 |
| 2004 | 0.17 | 0.15 | 0.02 | 0.77 | 0.77 | 0.82 |
| 2005 | 0.45 | 0.32 | 0.12 | 0.77 | 0.78 | 0.81 |
| 2006 | 0.57 | 0.43 | 0.28 | 0.78 | 0.78 | 0.79 |

Human Development Index 2000. Means are weighted by state population. The right-wing PAN was the party in Federal Government. The left-wing PRD was the main opposition party.

**Table 4: ENCEL Urbana descriptive statistics**

| | Mean 03 | S.D. 03 | Change 04-03 |
|---|---|---|---|
| Hh head | | | |
| ADL health index | 0.895 | 0.216 | -0.002 |
| labor force participation | 0.826 | -- | -0.003 |
| hours worked | 40.3 | 25.2 | -0.3 |
| labor income | 2,481 | 2,704 | 5.4 |
| expenditure primary care | 39.7 | 296.6 | 0.0 |
| expenditure hospitalization | 13.6 | 164.3 | -2.8 |
| sex (male=1) | 0.8 | -- | -- |
| age | 42.6 | 14.5 | -- |
| education | 5.2 | 3.5 | -- |
| married | 0.6 | -- | -- |
| non SS | 0.885 | -- | -- |
| Household per capita consumption | | | |
| total non-health | 555.7 | 373.8 | -39.7 |
| food | 339.4 | 253.0 | -15.4 |
| clothing | 26.7 | 47.6 | -10.8 |
| Household size | 5.3 | 0.5 | -- |

ENCEL Urbana 2003-2004, control group . Only individuals with constant social security coverage status across the two years are included. N = 3,180 but some variables have missing observations. ADL is activities of daily life index. All monetary quantities are monthly and expressed in 2006 pesos. Non SS is a dummy for not being covered by social security. Primary care refers to outpatient care expenditure.

**Table 5: Effects of health shocks**

**Change in labor market outcomes - household head**

| | active | | hours \| active | | log income \| active | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Change in Head's Health | 0.045*** | 0.025* | 1.173 | 0.877 | 0.003 | -0.012 |
| | (0.008) | (0.014) | (0.747) | (1.431) | (0.021) | (0.049) |
| noSS*Change in Health | | 0.022 | | 0.319 | | 0.017 |
| | | (0.019) | | (1.512) | | (0.050) |
| Observations | 3,123 | 3,123 | 2,286 | 2,286 | 2,117 | 2,117 |

**Change in health expenditure - household head**

| | primary care | | hospitalization | | total | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Change in Head's Health | -42.438*** | -2.565 | -24.500*** | -1.552 | -64.497*** | -4.195 |
| | (8.820) | (8.259) | (6.816) | (1.655) | (11.341) | (8.440) |
| noSS*Change in Health | | -45.921*** | | -26.415*** | | -69.513*** |
| | | (12.928) | | (7.915) | | (13.081) |
| Observations | 3,096 | 3,096 | 3,111 | 3,111 | 3,085 | 3,085 |

**Change in per capita consumption - all household members**

| | log total non-health | | log food | | clothing | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Change in Head's Health | 0.022* | 0.000 | 0.020 | 0.004 | 0.701 | -3.324 |
| | (0.012) | (0.024) | (0.015) | (0.039) | (0.786) | (3.518) |
| noSS*Change in Health | | 0.025 | | 0.019 | | 4.659 |
| | | (0.032) | | (0.046) | | (3.707) |
| Observations | 3,108 | 3,108 | 3,025 | 3,025 | 3,094 | 3,094 |

Estimates from equations (1) and (2). Only individuals with constant social security coverage status across the two years are included. Health is defined by an ADL index. The change in the ADL Index is expressed in terms of its standard deviation in 2003. noSS is a dummy for not being covered by social security. Active is a dummy for labor force participation during the last week. Standard errors clustered at the municipality level. All the regressions include a set of demographic controls (sex, age, years of education, marital status, and log household size) not reported in the table. Expenditures on clothing are in levels rather than logs because a large number of households do not spend on clothing every period.

**Table 6: ENSA descriptive statistics (mean values)**

| sample | Full | SS households | no SS hhs |
|---|---|---|---|
| year | 2000 and 2006 | 2000 | 2000 |
| HOUSEHOLDS | | | |
| Seguro Popular take-up | 0.055 | -- | -- |
| Morbidity | 0.134 | 0.157 | 0.140 |
| Seeks care \| Morbidity=1 | 0.592 | 0.658 | 0.533 |
| Financial reasons \| Morbidity=1 | 0.086 | 0.022 | 0.126 |
| Health Perception | | | |
| very good/good | 0.653 | 0.625 | 0.582 |
| very poor/poor | 0.043 | 0.045 | 0.053 |
| Index | 0.662 | 0.657 | 0.639 |
| Disability Index | 0.993 | 0.992 | 0.995 |
| USERS | | | |
| Provider | | | |
| Private | 0.348 | 0.232 | 0.402 |
| Public non SS | 0.270 | 0.131 | 0.440 |
| Expenditure services | | | |
| Expenditure > 0 | 0.491 | 0.296 | 0.653 |
| mean \| Exp. > 0 | 314.8 | 248.5 | 161.7 |
| Expenditure drugs | | | |
| Expenditure > 0 | 0.469 | 0.265 | 0.575 |
| mean \| Exp. > 0 | 308.9 | 292.5 | 270.2 |
| Expenditure total primary care | | | |
| Expenditure > 0 | 0.569 | 0.345 | 0.735 |
| mean \| Exp. > 0 | 522.7 | 443.7 | 346.9 |
| Health Improved | 0.809 | 0.791 | 0.790 |
| ADULTS | | | |
| Hypertension (anthropometric measures) | 0.327 | 0.223 | 0.197 |
| Hypertension (self reported) | | | |
| Diagnosed | 0.160 | 0.196 | 0.145 |
| Receives treatment \| diagnosed | 0.649 | 0.747 | 0.633 |
| Treatment provided by public non SS | 0.216 | 0.047 | 0.398 |
| Treatment provided by private | 0.229 | 0.125 | 0.400 |
| COVARIATES | | | |
| Non SS | 0.6 | 0.0 | 1.0 |
| Education | 6.5 | 8.0 | 5.3 |
| Age | 26.9 | 27.4 | 23.5 |
| Sex (male=1) | 0.486 | 0.5 | 0.5 |
| Hh size (members) | 5.2 | 4.7 | 5.3 |
| Hh monthly income | 5,540 | 6,993 | 4,036 |

ENSA 2000-ENSANUT 2006. Morbidity is a dummy for having experienced a health problem during last 2 weeks, Seeks care is a dummy for seeking medical attention in response to the health problem, Financial reasons is a dummy for not seeking attention due to financial concerns. Expenditure > 0 is a dummy for positive expenditure in a category. Public non SS refers to the non Social Security segment of the public health system. Health improved is a dummy for whether a visit to a health facility resulted in an improvement of health. All monetary figures are expressed in 2006 pesos.

**Table 7: Program effects on healthcare utilization and health**

| | | | | | Provider | | |
|---|---|---|---|---|---|---|---|
| | SP take-up | Morbidity | Seeks care | Financial reasons | Private | Public non SS | Health improved |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Target*noSS*D2006 | 0.340*** | -0.011 | 0.062 | -0.042 | -0.175** | 0.106* | 0.008 |
| | (0.032) | (0.009) | (0.063) | (0.029) | (0.066) | (0.061) | (0.036) |
| Obs. | 388,318 | 387,242 | 48,320 | 47,837 | 22,324 | 22,324 | 22,185 |
| Sample | Full | Full | Morbidity = 1 | Morbidity = 1 | Users | Users | Users |

Estimates from equation (3). Standard errors clustered at the state level. Morbidity is a dummy for having experienced a health problem during previous 2 weeks, Seeks care is a dummy for seeking medical attention in response to the health problem, Financial reasons is a dummy for not seeking attention due to financial concerns. Health improved is a dummy for whether a visit to a health facility resulted in an improvement of health. All the regressions include a set of demographic controls (education, sex, age, household size and monthly income) and locality level controls. The regressions in columns (3) and (4) additionally include two dummies to control for the seriousness of the health problem (there are three categories: light, moderate, and serious).

**Table 8: Program effects on health expenditure (ENSA)**

| | Services | | Drugs | | Primary Care | |
|---|---|---|---|---|---|---|
| | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Target*noSS*D2006 | -0.197*** | -0.247 | -0.261*** | -0.070 | -0.223*** | -0.312* |
| | (0.036) | (0.189) | (0.069) | (0.098) | (0.047) | (0.168) |
| Obs. | 22,494 | 9,473 | 22,494 | 8,756 | 22,494 | 10,630 |
| Sample | Users | Exp.> 0 | Users | Exp.> 0 | Users | Exp.> 0 |

Estimates from equation (3). Standard errors clustered at the state level. Dummy exp. > 0 is a dummy for positive expenditure in a category. All the regressions include a set of individual controls (education, sex, age, household size and monthly income, and dummies for the seriousness of the health problem) and locality level controls.

**Table 9: Program effects on hypertension**

| | | | | Treatment provider | |
|---|---|---|---|---|---|
| | Actual hypertension | Diagnosed (self-reported) | Receives treatment | Private | Public non SS |
| | (1) | (2) | (3) | (4) | (5) |
| Target*noSS*D2006 | 0.027 | -0.032** | 0.045 | -0.171*** | 0.244** |
| | (0.030) | (0.014) | (0.082) | (0.060) | (0.099) |
| Obs. | 88,797 | 81,622 | 12,840 | 8,441 | 8,441 |
| Sample | Adults | Adults | Diag.=1 | Treat.=1 | Treat.=1 |

Estimates from equation (3). Standard errors clustered at the state level. Actual hypertension is a dummy for blood pressure above the hypertension benchmark (from anthropometric survey data). The rest of the dependent variables are self-reported. Diagnosed is a dummy for whether individual has been diagnosed by a doctor. Treatment is defined only for individuals diagnosed with the condition. The type of provider is defined only for individuals receving treatment. All the regressions include a set of demographic controls (education, sex, age, household size and monthly income) and locality level controls.

**Table 10: Program effects on health status**

| | Health perception | | | |
|---|---|---|---|---|
| | good/ very good | poor/ very poor | index | Disability index |
| | (1) | (2) | (3) | (4) |
| Target*noSS*D2006 | 0.058** | -0.020*** | 0.019** | -0.001 |
| | (0.023) | (0.006) | (0.008) | (0.003) |
| Obs. | 386,927 | 386,927 | 386,927 | 387,475 |
| Sample | Full | Full | Full | Full |

Estimates from equation (3). Standard errors clustered at the state level. In column (1) the dependent variable is a dummy for reporting good or very good health, in column (2) for reporting bad or very bad health, in column (3) self-assesed health responses are incorporated into an index. In column (4) responses about the ability to walk and use the upper limbs are combined into an index, a value of 1 implies no disability, a value of 0 complete disability. All the regressions include a set of individual controls (education, sex, age, household size and monthly income) and locality level controls.

**Table 11: ENIGH descriptive statistics (mean values)**

| sample | Full | SS households | no SS hhs |
|---|---|---|---|
| year | 2000-2006 | 2000 | 2000 |
| Expenditure services | | | |
| Expenditure > 0 | 0.402 | 0.387 | 0.420 |
| mean \| exp. > 0 | 619 | 776 | 449 |
| Expenditure drugs | | | |
| Expenditure > 0 | 0.362 | 0.301 | 0.346 |
| mean \| exp. > 0 | 546 | 672 | 501 |
| Expenditure total primary care | | | |
| Expenditure > 0 | 0.450 | 0.415 | 0.447 |
| mean \| exp. > 0 | 992 | 1,212 | 810 |
| Expenditure hospital | | | |
| Expenditure > 0 | 0.023 | 0.018 | 0.019 |
| mean \| exp. > 0 | 5,673 | 5,750 | 5,833 |
| Labor Market hh head | | | |
| Active | 0.823 | 0.815 | 0.838 |
| hours \| active | 49.01 | 48.15 | 48.91 |
| formal \| active | 0.369 | 0.631 | 0 |
| wage per hour \| active | 21.5 | 35.31 | 7.902 |
| Labor Market hh others | | | |
| Active | 0.444 | 0.448 | 0.392 |
| hours \| active | 40.72 | 41.01 | 38.9 |
| formal \| active | 0.322 | 0.184 | 0 |
| wage per hour \| active | 15.1 | 21.32 | 4.888 |
| Covariates | | | |
| Non SS | 0.50 | 0.00 | 1.00 |
| Quarterly total income | 25,080 | 32,100 | 16,000 |
| Quarterly expenditure (non-health) | 21,039 | 26,800 | 13,800 |
| Hh size (members) | 4.0 | 4.1 | 4.2 |
| Members 12-64 | 2.8 | 2.9 | 2.7 |
| Members 65+ | 0.2 | 0.2 | 0.2 |
| Education (head) | 7.4 | 8.5 | 5.3 |
| Age (head) | 46.9 | 45.8 | 46.8 |

2000, 2004, 2005, and 2006 waves of ENIGH. There are 76,752 households, each with one household head. There are 156,665 non-head household members. Expenditure > 0 is a dummy for positive expenditure in a category. Active is a dummy for labor force participation during the last month. All monetary quantities are expressed in 2006 pesos.

**Table 12: Program effects on health expenditure (ENIGH)**

| | Services | | Drugs | | Primary Care | |
|---|---|---|---|---|---|---|
| | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Target*noSS | -0.123*** | -0.097 | -0.097*** | -0.104 | -0.112*** | -0.090 |
| | (0.027) | (0.209) | (0.026) | (0.155) | (0.028) | (0.221) |
| Observations | 76,266 | 29,109 | 76,266 | 26,431 | 76,266 | 32,941 |
| sample | Full | Exp.> 0 | Full | Exp.> 0 | Full | Exp.> 0 |

Estimates from equation (4). The intensity target varies over time for a state. Dummy exp. > 0 is a dummy for positive expenditure in a category. Standard errors clustered at the state level. All the regressions include a set of demographic controls (household income, non-health expenditure, size, members in the 12-64 and 65 plus years age ranges, head's years of education and age) and locality level controls.

**Table 13: Program effects on health expenditure: falsification exercise**

| | Services | | Drugs | | Primary Care | |
|---|---|---|---|---|---|---|
| | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Target2004*noSS*D2000 | 0.141 | 0.311 | -0.002 | 0.142 | 0.084 | 0.137 |
| | (0.089) | (0.286) | (0.093) | (0.293) | (0.095) | (0.293) |
| Observations | 20,440 | 7,687 | 20,440 | 5,684 | 20,440 | 8,242 |
| sample | Full | Exp.> 0 | Full | Exp.> 0 | Full | Exp.> 0 |

Estimates from equation (5). Each row corresponds to a different regression. The intensity target varies over time for a state. Dummy exp. > 0 is a dummy for positive expenditure in a category. Standard errors clustered at the state level. All the regressions include a set of demographic controls (household income, non-health expenditure, size, members in the 12-64 and 65 plus years age ranges, head's years of education and age). Locality level controls are not included, because they cannot be matched to households for 1998.

**Table 14: Program effects on health expenditure: heterogeneous effects**

| | Services | | Drugs | | Primary Care | |
|---|---|---|---|---|---|---|
| | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) | Dummy exp.> 0 | log (exp.) |
| **sample: all households** | (1) | (2) | (3) | (4) | (5) | (6) |
| Target*noSS | -0.123*** | -0.097 | -0.097*** | -0.104 | -0.112*** | -0.090 |
| | (0.027) | (0.209) | (0.026) | (0.155) | (0.028) | (0.221) |
| Observations | 76,266 | 29,109 | 76,266 | 26,431 | 76,266 | 32,941 |
| **sample: hh with members under 5** | | | | | | |
| Target*noSS | -0.230*** | 0.093 | -0.135*** | -0.188 | -0.199*** | 0.003 |
| | (0.055) | (0.248) | (0.046) | (0.242) | (0.058) | (0.278) |
| Observations | 26,836 | 11,927 | 26,836 | 10,984 | 26,836 | 13,259 |
| **sample: hh with members over 60** | | | | | | |
| Target*noSS | -0.100 | -0.738** | -0.250*** | -0.292 | -0.166** | -0.449 |
| | (0.069) | (0.328) | (0.087) | (0.244) | (0.081) | (0.295) |
| Observations | 18,418 | 6,683 | 18,418 | 6,432 | 18,418 | 7,863 |

Estimates from equation (4) on different sub-samples. Each panel corresponds to a different sub-sample. The intensity target varies over time for a state. Dummy exp. > 0 is a dummy for positive expenditure in a category. Standard errors clustered at the state level. All the regressions include a set of demographic controls (household income, non-health expenditure, size, members in the 12-64 and 65 plus years age ranges, head's years of education and age) and locality level controls.

**Table 15: Program effects on health and non-health consumption**

| | Budget share primary care | Health expenditure (pesos) | Non-health expenditure (log) |
|---|---|---|---|
| | (1) | (2) | (3) |
| Target*noSS | -1.266** | -362.654*** | 0.023 |
| | (0.545) | (104.960) | (0.042) |
| Observations | 76,116 | 76,266 | 76,115 |
| Sample | Full | Full | Full |

Estimates from equation (4). The intensity target varies over time for a state. Budget share varies between 0 and 100. Standard errors clustered at the state level. All the regressions include a set of demographic controls (household income, non-health expenditure, size, members in the 12-64 and 65 plus years age ranges, head's years of education and age) and locality level controls. All monetary quantities are expressed in 2006 pesos.

**Table 16: Program effects on labor supply**

| | hh head | | other members | |
|---|---|---|---|---|
| | Active | Hours | Active | Hours |
| | (1) | (2) | (3) | (4) |
| Target*noSS | 0.025 | -0.131 | 0.069 | -1.906 |
| | (0.023) | (1.320) | (0.047) | (1.700) |
| Observations | 76,533 | 63,127 | 156,247 | 69,174 |
| Sample | Adults | Active | Adults | Active |

Estimates from equation (4). The intensity target varies over time for a state. Active is a dummy for labor force participation during the last month. Hours are hours worked per week. The estimates in columns (2) and (4) only include individuals that participate in the labor market. Standard errors clustered at the state level. All the regressions include a set of demographic controls (years of education, sex, household size, members in the 12-64 and 65 plus years age ranges, 10 year age dummies, and dummies for rural and agricultural households) and locality level controls.

**Table 17: Program effects on labor market formality**

| | hh head | | other members | |
|---|---|---|---|---|
| | formal | log(wage) | formal | log(wage) |
| | (1) | (2) | (3) | (4) |
| Target | 0.025 | 0.024 | 0.018 | 0.018 |
| | (0.017) | (0.052) | (0.043) | (0.045) |
| Target*Informal | -- | 0.006 | -- | -0.008 |
| | | (0.156) | | (0.144) |
| Observations | 63,427 | 43,300 | 70,336 | 45,745 |
| Sample | Active | wage > 0 | Active | wage > 0 |

Estimates in the first and the third column from a regression of formality on intensity target (which varies over time for a state), time and state fixed effects. Estimates in the second and fourth columns from an equation similar to (4) but with Informal replacing noSS. The wage is net of taxes. All the estimations include individuals who are active in the labor market only. Standard errors clustered at the state level. All the regressions include a set of demographic controls (years of education, sex, household size, members in the 12-64 and 65 plus years age ranges, 10 year age dummies, and dummies for rural and agricultural households), a set of fixed effects for the characteristics of the job and locality level controls.

**Table 18: Responses to: "If services were free, which institution would you choose?"**

| | non SS households | SS households |
|---|---|---|
| Social Security | 27.30 | 48.04 |
| Public non SS | 31.09 | 12.65 |
| Private | 27.30 | 31.23 |
| Don't know/ no response/other | 14.31 | 8.09 |

Source: ENSANUT 2006. N=47,152. Percentage of responses for each type of provider by social security coverage status.