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HEALTH CARE SERVICES UTILIZATION AND HEALTH INSURANCE COVERAGE: EVIDENCE FROM ARGENTINA

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Abstract

This study is the first comprehensive analysis of the relationship between health care services utilization and health insurance coverage for Argentina. Using data from a 1989 household survey, a two equation model is estimated in order to account for the selection bias in health insurance markets and the stochastic dependence between health insurance and utilization. The evidence found, using data on visits to outpatient health care services, is consistent with conventional theory and studies for other countries. Health insurance coverage positively affects health care utilization. The most important factors determining the intensity of health care services utilization are morbidity conditions. Health insurance coverage is strongly affected by factors related to the labor market; income appears to have an important effect only on the health insurance equation.

I. Introduction

Concerns about efficiency and equity have led governments in developed and developing countries to reform the health care sector. Much of the public policy attention has been concentrated in reforming social and private health insurance arrangements. However, informed policy reforms require knowledge of some basics

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of health care such as: (i) how does health insurance matter in health care demand?; (ii) how do socio-demographic factors (income, education, age, gender, marital status, family composition) affect health care demand and health insurance status?; and (iii) how does health status influence health care and insurance demands? The relationship between health insurance status and the demand for health care services has been well documented in the literature, however the great majority of these studies are on developed countries. Little attention has been given to developing countries but with well-developed social and private health insurance systems. The main reason for such studies have not been considered is the lack of appropriate data.

This study is the first comprehensive analysis of the relationship between health insurance and utilization of health care services in Argentina. Recently, Menem's Administration has enacted legislation that starts a gradual liberalization of the social insurance health organizations sector. The Congress is also discussing several legislative drafts related to the labor market and the organization of the health care sector. The government wants to improve efficiency and quality in health care provision by avoiding over-insurance and forcing social insurance health organizations to compete in providing insurance, and eventually to merge the social and private health insurance markets. The impact of such institutional changes has not been qualitatively assessed, and even though the goal of this study is not to evaluate the proposed insurance reform, the results presented here could lead to a better understanding of the effects of the eventual changes in the health insurance sector and contribute to improve health care policy design not only in Argentina but in other countries with similar characteristics. Specifically, I study two issues: the interdependence between the demand for health insurance and health care, and the determinants of the demand for health care more generally. In addition, this paper demonstrates the empirical implementation of econometric models involving simultaneously discreteness of choice, selection bias in health insurance markets and stochastic dependence between health insurance and utilization.

A two equation model of health care demand and health insurance coverage is estimated using the Module of Health Care Utilization and Expenditures (MHCUE) included in the May 1989 wave of the Argentine Permanent Household Survey. These data contain the first comprehensive and reliable set of health and socio-demographic variables jointly collected at the household level for Argentina which allow me to explore for the first time micro-econometric and policy issues related to this country's health sector. The data include detailed health insurance information about coverage and a complete array of health care utilization measurements. This paper focuses on one utilization measure, visits to outpatient health care services (OHS), which accounts for one of the largest shares of health care expenditure (Katz and Muñoz, 1988). My goal is to assess empirically the relative importance of the individual's health insurance status (i.e., the moral hazard problem) and the extent of selectivity in determining the utilization of health services.

The evidence found is consistent with conventional theory and studies for other countries. Health insurance coverage positively affects health care utilization. As was expected, the most important factor determining the intensity of health care services utilization is health status (morbidity conditions). Individual's health insurance status is strongly affected by factors related to the labor market. Income appears to have an important effect as well.

The plan for the paper is as follows. The institutional background of Argentina's health care sector is presented in Section II. In Section III I review the literature on health care demand and health insurance demand. The economic model is introduced in Section IV. In Sections V and VI I discuss the data, the estimation methodology and the results. Section VII concludes.

II. Health Care Sector Organization in Argentina[1]

Argentina's health sector consists of three major sub-sectors: the social insurance health organizations or "*Obras Sociales*" (OS), the private health insurers and providers, and the public health system. The social insurance health organizations give legally mandated coverage to all formal non-self-employed workers and their dependents. They are financed through mandatory wage contributions and organized by industry/occupation activity sectors: for instance provincial public servants, auto-mechanics, financial sector workers, and so on. Traditionally, these not-for-profit institutions have been associated with and administered by the corresponding workers' union. Because of its organization, the OS sector has been largely fragmented and stratified. The OS are primarily insurers, contracting most health care services with private providers.[2]

The private sector consists of both health care providers and private health insurers. Some private health insurers also supply health care services for their beneficiaries, like Health Maintenance Organizations in the United States. Private health insurance premiums are paid primarily by self-employed workers who are not members of any OS and do not want to use public health services. In addition, although non-self-employed workers have legally mandated coverage in OS, some of them contract supplementary private health insurance in order to have access to higher quality medical care.[3]

Finally, the public system resembles the British National Health Insurance where a public network of health services provide health care to anyone who needs it. In practice, the majority of the beneficiaries are those that lack any formal insurance coverage. Most of the services are provided free of charge and financing is primarily from general tax revenues.[4]

Given the political consensus that relaxing the mandatory contribution to a particular OS would bring more efficiency to the system, the government has recently enacted legislation that would gradually liberalize the OS sector. The idea is that under the new regime, OS would be forced to compete for members, raising the quality of health care services. Furthermore, the legislation says that

each worker and his or her family can only be affiliated to a single social insurance health organization. With this measure, the government seeks to avoid the inefficiencies created by double insurance ("over-insurance") due to mandatory contribution to an specific OS, and lack of competition among insurers. For instance, a non-self-employed worker who has two part-time jobs is currently forced to make contributions to two different OS. In the new scheme, regardless of how many different jobs family members hold, all members of the family who work will contribute to only one OS of their choice. Another argument for liberalizing the social health insurance sector is that the current structure –organization by industry/occupations– may be producing a sort of "sectoral" job-lock. Health insurance may distort job mobility if employees decide to keep jobs they would rather leave for fear of losing current coverage. The health insurance job-lock may also negatively affect the productivity of the economy as a whole if individuals who would like to move to more productive jobs are constrained to stay in their current positions simply to maintain their coverage (Madrian, 1994).

2.1 Predominant health insurance types in Argentina's health sector

There are four predominant types of health insurance. The first one is the social insurance health organizations or OS; the remaining three are private insurance schemes: "mutuales"; "pre-paid" plans; and "emergency" plans. These types of insurance are neither completely substitutes nor exclusive. Those who lack formal insurance, i.e. the uninsured, have access to health care services provided by provinces and municipalities through their public facilities network.

The most important characteristic of the OS sector is that insurance coverage is mandated for non-self-employed workers. Additional premiums are required for members with a plan not in their own name and their affiliation is a choice. On the other hand, the two most important private health insurance are "mutuales" and "pre-paid" plans. The "mutuales" are not-for-profit mutual assistance organizations which offer health care plans funded by individual or family premiums. Unlike OS, these institutions do not receive financing from employers and affiliation is not legally mandated but totally voluntary. Many of these "mutuales" belong to ethnic or nationality groups and were organized at the beginning of the nineteenth century when there was a large flow of immigration to Argentina.

The "pre-paid" plans are voluntary health insurance schemes based on individual and family premiums. Several of these private companies have their own facilities and operate like HMOs. Because the scope and quality of health services that OS finance have declined and users satisfaction levels have been falling in recent years, the "pre-paid" health insurance sector has been expanding considerably. Finally, the "emergency" plans are also voluntary insurance schemes operated by companies that provide specific emergency services.

Who are the beneficiaries of each type of health coverage? Approximately 70 percent of the population has at least one source of coverage (see Table 1). The rate of affiliation increases with age, income bracket and schooling. On average, men, family heads, and employed workers have higher coverage than women,

TABLE 1

RATE OF AFFILIATION TO FORMAL HEALTH INSURANCE SCHEMES, MHCUE 1989
LABOR FORCE PARTICIPANTS, AGE 16-65

Population Group	Total Rate of Affiliation[a]	Obras Sociales	Pre-paid Plans	Mutuales	Emergency Plans	N
Total	.692	.559	.115	.025	.014	8046
Age						
16-25	.608	.505	.083	.014	.007	1900
26-35	.697	.575	.112	.025	.017	1969
36-50	.713	.567	.127	.028	.016	3285
51-65	.776	.607	.142	.035	.016	892
Sex						
Male	.675	.537	.113	.026	.015	5065
Female	.719	.595	.118	.023	.013	2982
Family Head						
Yes	.713	.571	.128	.027	.014	4061
No	.669	.545	.101	.022	.013	3989
Schooling						
Elementary	.592	.524	.050	.017	.010	3316
High School	.717	.586	.123	.027	.015	2719
College	.892	.668	.259	.043	.024	1445
Region						
Buenos Aires	.633	.536	.079	.019	.010	4820
Capital Federal	.826	.607	.209	.030	.008	1961
Mendoza	.700	.574	.053	.073	.108	1265
Income						
1st Quartile	.528	.392	.091	.011	.004	2050
2nd Quartile	.632	.557	.053	.022	.007	2015
3rd Quartile	.726	.612	.093	.025	.017	1985
4th Quartile	.869	.678	.216	.041	.027	1996
Labor Status						
Employed	.715	.581	.117	.025	.015	7471
Unemployed	.398	.281	.093	.015	.003	575
Type of worker						
Non-self-employed	.747	.657	.076	.022	.011	6000
Self-employed	.530	.269	.230	.034	.021	2046
Worker's Sector						
Industry	.775	.663	.108	.023	.008	1660
Construction	.335	.284	.039	.005	.009	478
Commerce	.665	.445	.196	.035	.016	1366
Transport	.766	.679	.077	.035	.014	532
Finance	.878	.692	.208	.039	.035	516
Public Services	.727	.644	.089	.024	.017	2412

[a] The sum of OS, pre-paid plans, mutuales and emergency plans may be greater than the total rate of affiliation because individuals may be covered by more than one type of health insurance.

family members who are not the head, and unemployed workers; while among the employed, the self-employed have a lower rate of coverage. There are also important differences in coverage among the three urban areas considered and among industries. Because affiliation with an OS is mainly obtained through employment and contributions to this scheme are mandatory for non-self-employed workers, OS account for the largest proportion of coverage (55.9 percent). Coverage by other schemes is much lower: 11.5 percent of the sample is enrolled in a pre-paid plan, 2.5 percent in a "mutual" and 1.4 percent in an "emergency" plan. Coverage by health plans other than OS seems to be more driven by income than other factors. The rate of affiliation to OS in the fourth quartile is 1.73 times that of the first quartile. On the other hand, the rate of affiliation to "pre-paid" plans in the fourth quartile is 2.37 times the rate in the first quartile; while the corresponding rates are 3.72 times higher for "mutuales" and 6.75 times higher for "emergency" plans.

III. Health Care Demand and Health Insurance Status: Motivation and Literature Review

The literature has largely emphasized that the demand for health care is conditioned by the health insurance status of the user. Arrow (1963) suggested that there is an intimate relation between the demand for health care and health insurance: there is a *moral hazard* problem given that the effective price of health care is distorted by the presence of health insurance. More comprehensive insurance coverage encourages more use of health services. In addition, the insurance decision itself depends on expected future consumption of health services; thus, individuals who anticipate more health care utilization select more comprehensive insurance (the *adverse selection* problem).

The research on the relationship between health insurance and health care demand is extensive, however the majority of studies have been done for the Unites States and other fully-developed countries. One important set of studies use data from the Rand Health Insurance Experiment. In that study, conducted during the 1970s, researchers randomly assigned individuals to insurance plans. This randomized controlled trial methodology was intended to eliminate the selectivity problem that characterizes health insurance demand. However, because of its nature, the data do not allow researchers to study insurance demand, but only health care utilization and expenditures[5] (Manning et al., 1987). For Argentina, only non-experimental data is available, thus I must consider the problems discussed before.

Previous studies using different methods (Feldstein, 1973; Manning et al., 1987; Cameron et al., 1988; Cardon and Hendel, 1996; among others) have investigated empirically the interdependence between health care utilization and insurance demand for different countries. Cameron et al. (1988), Cameron and Trivedi (1991) and Bolduc et al. (1996) use an economic model of utility maximization under uncertainty to derive linearized versions of both the demand for health care

services and the demand for health insurance. The first paper concentrates on the demand for health care services, the second one focuses on the demand for health insurance, and the third studies the health care provider choice. Bolduc et al. use a model akin to that of Cameron et al. to justify individuals' saving decisions to protect themselves against future spells of illness.

Most of the evidence supports the idea of a positive relationship between health insurance coverage– or more extensive health insurance coverage –and health care demand. Argentina's data also seem to support this positive relation: individuals affiliated to any health insurance plan have, on average, higher rates of utilization and more intense use *vis-à-vis* those individuals who lack any formal health insurance coverage.[6]

Table 2 contains evidence for the case of outpatient health care services (OHS). This table provides the sample means and the standard deviations conditional on coverage status for labor force participants' total sample, age groups 16-45 and 46-65, and men and women. The differences in utilization quantities are statistically significant for both measures of usage: rate of utilization and intensity of use. This preliminary evidence supports the idea that the presence of insurance is associated with larger health care services utilization. The empirical question that follows is whether differences still persist after controlling for variables that may reflect selectivity.

The available data for Argentina does not provide precise and detailed measures of coverage (such as coinsurance rates, deductibles, etc.). However, indirectly we can obtain a measure of "degree" of coverage, observing to which and to how many insurance types an individual is affiliated. Table 3 provides the conditional sample means and the standard deviations for rate of utilization and intensity of use of OHS by type of insurance coverage. In general, those individuals covered by OS have on average higher use of health services. Furthermore, insurance types that offer more comprehensive coverage lead to higher utilization, e.g. OS vs. emergency plan. Another finding is that individuals covered by more than one plan –e.g. OS and pre-paid plan *vis-à-vis* only OS– have substantially higher use of health services. The empirical question here is whether these differences are due to either a moral hazard problem or an adverse selection problem, or both. Another factor that may explain higher utilization is income, which is expected to be positively correlated with more comprehensive coverage. For instance, Cameron and Trivedi (1991) find that in Australia income appears to be more important in determining health insurance choice than in determining health care services use.

IV. The Economic Model

I follow Cameron et al. (1988), Cameron and Trivedi (1991) and Bolduc et al. (1996) in using a basic individual utility maximizing model as a basis for linearized versions of both the utilization of health care services and the demand for health insurance. Also, like the model of Manning and Marquis (1996), these

TABLE 2

OUTPATIENT HEALTH CARE SERVICES (OHS):
RATE OF UTILIZATION AND INTENSITY OF USE[a]
CONDITIONAL SAMPLE MEANS BY POPULATION GROUPS,
LABOR FORCE PARTICIPANTS
(standard deviations shown in parenthesis)

	Outpatient Care	# of Outpatient Care Visits *Intensity of use*	
	Rate of utilization	Unconditional	Conditional > 0
Total Sample			
Health Insurance = 1	.290 (.454)	.556 (1.199)	1.777 (1.558)
Health Insurance = 0	.180 (.385)	.328 (0.944)	1.321 (1.511)
Diff. Means t-test[b]	10.44*	8.29*	6.24*
Women			
Health Insurance = 1	.362 (.481)	.703 (1.249)	1.805 (1.419)
Health Insurance = 0	.254 (.435)	.470 (1.104)	1.483 (1.533)
Diff. Means t-test[b]	5.67*	4.66*	8.45*
Men			
Health Insurance = 1	.244 (.429)	.462 (1.157)	1.751 (1.678)
Health Insurance = 0	.142 (.349)	.253 (0.839)	1.192 (1.482)
Diff. Means t-test[b]	8.31*	6.46*	5.39*
Age 16-45			
Health Insurance = 1	.270 (.444)	.525 (1.233)	1.800 (1.710)
Health Insurance = 0	.169 (.375)	.293 (0.875)	1.321 (1.511)
Diff. Means t-test[b]	7.73*	6.63*	8.58*
Age 46-65			
Health Insurance = 1	.319 (.466)	.599 (1.150)	1.751 (1.358)
Health Insurance = 0	.201 (.401)	.392 (1.056)	1.409 (1.607)
Diff. Means t-test[b]	6.61*	4.63*	3.28*

[a] 5% level significance.
[a] *Rate of utilization* for a population group is defined as the proportion who used at least one time outpatient health services during the last month. *Intensity of use* is defined as the number of outpatient health care visits during the last month.
[b] The t-statistic tests the null hypothesis of no difference between utilization means for individuals affiliated and not affiliated to any health insurance plan.

TABLE 3

OUTPATIENT HEALTH CARE SERVICES (OHS):
RATE OF UTILIZATION AND INTENSITY OF USE[a]
SAMPLE MEANS BY TYPE OF HEALTH INSURANCE COVERAGE,
LABOR FORCE PARTICIPANTS
(standard deviations shown in parenthesis)

Type of Health Insurance Coverage	Outpatient Care *Rate of utilization*	# of Outpatient Care Visits *Intensity of use*	
		Unconditional	Conditional > 0
1. Only Obra Social (OS)	.279 (.446)	.515 (1.153)	1.580 (1.550)
2. Only Pre-paid Plan	.305 (.461)	.485 (1.089)	1.088 (1.417)
3. Only Mutual	.248 (.433)	.320 (1.102)	1.072 (1.374)
4. Only Emergency Plan	.163 (.369)	.179 (.969)	1.022 (1.161)
5. Obra Social and Pre-paid Plan	.379 (.486)	.955 (2.169)	2.343 (2.887)
6. Obra Social and Mutual	.375 (.487)	.619 (1.010)	1.527 (1.064)
7. Obra Social and Emergency Plan	.452 (.499)	.731 (.980)	1.557 (0.871)
Diff. Means F-test [b]			
1 to 4	9.22 *	21.59 *	75.54 *
1 to 7	16.29 *	22.28 *	96.37 *

* 5% level significance.
[a] See definitions in footnotes in Table 2.
[b] The F-statistic tests the null hypothesis of no difference among means for the different types of insurance coverage.

models rely on the economic proposition that choices about utilization of health services depend on the same variables and parameters as do choices about insurance. However, there is a major difference between the demand for health insurance and the demand for health services: the choice of the former is made before uncertainties about health states are resolved, while the decision of the latter is made after the illness occurs. Consumer theory can be used to integrate these two demands by acknowledging that the same direct or indirect utility maximizing problem yields both the choice of health insurance coverage and the amount of health care services used. Thus, the insurance coverage decision is made before

the individual knows whether she will be sick or not, and the individual chooses the level of coverage that provides the maximum expected utility over the different health states. Once the individual knows whether she is sick or well, the individual demands health care services in order to maximize utility.

Therefore, it can be stated that a consumer's utility depends on the consumption of goods and on the "quality" of life. Health is one measurement of life quality and is "produced" by combining inputs according the technology of the underlying health production function. In this framework, an individual maximizes utility conditional on her budget constraints. The consumer's problem is solved to yield a conditional demand function which is conditioned on whether or not the individual is covered by a health insurance plan.

Following Cameron et al. (1988), I consider a model where consumers have a two-period utility function. Specifically, the consumers derive utility (U), from their health (H), and consumption in both periods (C_1 and C_2). Health is "produced" through a production function that depends on health care services, Q, and health status, s, conditional on vectors **A** and **B**. Vector **A** refers to consumer's exogenous attributes or characteristics such as age, marital status and income; **B** refers to the vector of health insurance attributes. The utility function and the health production function are assumed both increasing in their arguments. No bequest motive is considered. Formally, each consumer has the following utility function:

$$U_i = U_i\,(C_{i1}\,,\ C_{i2}\,,\ H_i\,(Q_i\,,\ S_i \mid A_i\,,\ B_i)) \tag{1}$$

Uncertainty arises in the model because when health insurance is chosen, the health status that will prevail in the next period is unknown. Consumers have a probability measure of health status conditional on their individual characteristics given by $\pi_i = \pi_i\,(s \mid A)$. The model assumes also that there are a limited number J of different health insurance coverage types. In practice consumers experience a limited combination of health insurance alternatives: only social insurance, only private insurance, a combination of both, or no health coverage at all. Not only because my interest is in the overall effect that health insurance status has on health care services utilization, but also because of tractability, this paper focus in only two health insurance states: having or not having a health plan.[7]

Consumers can transfer income between periods through a risk-free asset, **a**, which yields an interest rate, r. Thus, dropping the i subindex for easy exposition, an individual solves the following expected utility maximization problem:

$$MAX\ E\,(U) = \int_s U\,(C_1\,,\ C_2\,,\ \mathrm{H}\,(Q\,,\ s \mid A,\ B))\ d\pi\,(s \mid A) \tag{2}$$

Subject to the following three budget constraints:

$$Y_1 = Y_{1j} + I_j \tag{3}$$

$$Y_{1j} = C_1\,(s) + a\,(s) \tag{4}$$

$$Y_{2j} + (1+r)\ a\,(s) = C_2\,(s) + p_j\,Q\,(s) \tag{5}$$

The first constraint states that autonomous income, Y_1, is allocated between the insurance premium, I_j, and income, Y_{1j}, for consumption of other goods and savings in the first period. This is precisely what the second constraint states, i.e., the individual allocates the after premium income to consumption, C_1 (s), and the risk-free asset, **a** (s). Note that the allocation of resources to buy the insurance premium is made before the health state is known. Finally, the third constraint states that income in the second period (the autonomous amount Y_{2j}, and the amount resulting from savings decisions taken in the first period, (1+r) a (s)) is allocated to goods for consumption, C_2 (s), and health care services, Q (s). The consumption decisions for health care services and other goods are conditional on health states. The price of consumption goods has been normalized and is assumed to be equal in both periods; finally, p_j is the price per unit of health care services Q net of reimbursement under the health insurance plan j.

Thus, the life-time budget constraint is:

$$Y_{1j} + \frac{Y_{2j}}{(1+r)} = C_1\,(s) + \frac{C_2\,(s)}{(1+r)} + \frac{p_j\,Q\,(s)}{(1+r)} \tag{6}$$

where life-time income is used to finance health insurance premiums, consumption of other goods besides health care in both periods and health expenditures in the second period. Two additional assumptions have been included: first, income in the first and second period, Y_1 and Y_2, does not depend upon health states; and second, health capital and past health states are not incorporated in the health production function. The reason for such simplifications is that the data I use do not contain this information.

Cameron et al. (1988) specify tractable functional forms for the utility and health production functions and solve the consumer's maximization problem. Conditional on health insurance plan j and each possible realization of the unknown health state s, one can obtain the demand equations for C_1, C_2 and Q. These demands can then be substituted back into equation (2), and integration over s gives the expected indirect conditional utility function, E V_j, associated with insurance plan j. Bolduc et al. (1996) use the same model, however they argue that the main difficulty with such an approach is that it is quite difficult to find functional forms for the utility and health production functions which yield closed form solutions for the endogenous variables. One could use a tractable direct utility function, as Cameron et al. do, to derive the demand equations. However, the substitution of the demand functions back into the direct utility function yields a highly non-linear expected indirect utility function that must be linearized to simplify the econometric estimation. Both Cameron et al. and Bolduc et al. follow such strategy, this is, they assume that the expected indirect utility function is linear in parameters.

Thus, risk adverse individuals maximize the expected utility function (2) subject to their lifetime budget constraint (6) yielding the demand equations for con-

sumption of goods and health services as a function of all exogenous variables conditional on health plan j: C_1^* , C_2^* , $Q^*(s|j)$.

The purpose of this paper is to estimate the demand for health care taking into account that some consumers have previously chosen health insurance to protect themselves from uncertain negative health states. The model illustrated above emphasizes that health care services utilization and health insurance status are not independent events. If individuals perceive that a bad state of nature has a large probability of occurrence, health will be negatively affected. Consequently, it will be reasonable to look for health insurance coverage in order to allow better treatment in the second period. Given this logic, there is the possibility that individuals who have health insurance also have unobservable characteristics that increase (or reduce) the possibility of bad health states. In econometric terms, this means that the individual decision to have health insurance –or the choice of what degree of health insurance coverage to buy– is endogenous.

The substitution of the conditional demands and the integration over different health states, give the corresponding conditional indirect utility function associated with health plan j,

$$E\ V_j^* = E\ U_j\ (C_1^*\ ,\ C_2^*,\ Q^*) \tag{7}$$

Equation (7) can be used as a basis to derive a discrete choice model of health insurance. An error term, ε_j, needs to be added in order to allow the presence of omitted variables unobserved by the econometrician but known by the consumer. Thus, (7) becomes:

$$V_j = E\ V_j^* + \varepsilon_j \tag{8}$$

The status of having insurance (j=1) or not (j=2), can be estimated using a discrete model of health insurance. The difference in indirect utility between the alternatives of having or not having insurance drives the binary equation, where $P\ (V_2 + \varepsilon_2 > V_1 + \varepsilon_1) = P\ (V_2 - V_1 > \varepsilon_2 - \varepsilon_1)$. The assumption for the distribution of $v = (\varepsilon_2 - \varepsilon_1)$ will determine whether the binary model is logit, probit or linear probability. A linearized version for the health insurance (HI) equation can be written as follows,

$$HI = X_{A1}\ \beta_{A1} + X_{A2}\ \beta_{A2} + X_{A3}\ \beta_{A3} + X_B\ \beta_B + v \tag{9}$$

Where X_{A1} is a vector of individual characteristics such as health status, age, marital status and schooling; X_{A2} is a vector of family characteristics such as family size and family income; X_{A3} is a vector of dummy variables indicating the province of residence; and X_B includes those variables unique to the health insurance plan.

The statistical relation for the demand function for health care services is obtained from the conditional demand $Q^*(s \mid j)$, assuming that the integration over health states can be written linearly as:

$$Q\ (s \mid j) = X_{A1}\ \beta_{A1} + X_{A2}\ \beta_{A2} + X_{A3}\ \beta_{A3} + p_j + w_j \tag{10}$$

Where p_j is the already defined price per unit of health care services net of reimbursement under the health insurance j, and w_j is the stochastic error term. Because p_j is unobserved, it can be replaced by (δ HI), where HI is a dummy variable for health insurance status. The dummy takes the value one if the individual has a formal health insurance plan, and zero otherwise. Although I focus the empirical analysis in HI as a single dummy variable, I will also report estimations for HI being a vector of dummies for different health plans. Thus, the statistical equation for outpatient health care services (OHS) to be estimated is (11):

$$OHS = X_{A1}\ \beta_{A1} + X_{A2}\ \beta_{A2} + X_{A3}\ \beta_{A3} + \delta\ HI + w \tag{11}$$

What is the interpretation of the dummy coefficient δ? Health insurance may have both an income effect by shifting the budget constraint outward, and a price effect by reducing the relative cost of medical care (Currie and Thomas, 1995). Thus, health insurance reduces the net price of health care by lowering the out-of-pocket expenditure at the time of purchase, implying that the presence of insurance should raise health care utilization rates and intensity of use, other things being equal. The coefficient δ captures, therefore, the increase in utilization due to moral hazard.

V. Data and Estimation Methods

The data set used is the Module of Health Care Utilization and Expenditures (MHCUE) included in the May 1989 wave of the Argentine Permanent Household Survey. The MHCUE is a cross-section data set that provides information on health care status and utilization of health services along with detailed information on individual and family characteristics. The data set consists of about 20,000 individuals and 5,000 households from three major urban areas of Argentina: Federal Capital, Greater Buenos Aires and Greater Mendoza. The data include detailed health and socio-demographic variables collected at the household level. Health insurance information about coverage and limited information on health status are also included; both are incorporated into the empirical model. The definition of variables used in the empirical model and their descriptive statistics are in Table 4.

5.1 Socio-demographic factors affecting health care utilization and health insurance status

Because both consumption decisions and the production of health care can occur within the family, total family resources and other family restrictions may be more accurate measures of the constraints, both time and money, faced by the

TABLE 4

DEFINITION OF VARIABLES AND DESCRIPTIVE STATISTICS[a]

Variable	Definition	Labor Force		Labor Force with Mandatory Insur.		Labor Force w/o Mandatory Insur.	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
OHS	Number of visits to outpatient health care services in last month	0.485	1.131	0.552	1.217	0.407	1.016
ROHS	Rate of utilization in last month	0.256	0.436	0.287	0.452	0.217	0.412
HI	Dummy, 1 if affiliated to any formal health insurance plan	0.690	0.462	1.000	0.000	0.317	0.465
OS	Dummy, 1 if affiliated to any Obra Social	0.559	0.496	0.981	0.134	0.073	0.261
PREPAID	Dummy, 1 if affiliated to any Pre-paid plan	0.115	0.319	0.035	0.186	0.208	0.406
MUTUAL	Dummy, 1 if affiliated to any Mutual	0.025	0.156	0.019	0.137	0.032	0.176
EMERG	Dummy, 1 if affiliated to any Emergency plan	0.014	0.018	0.013	0.115	0.015	0.123
AGE	Age	37.213	12.905	37.673	12.794	36.678	13.014
SEX	Dummy, 1 if women, 0 otherwise	0.373	0.483	0.396	0.489	0.348	0.476
LNINCOME	Log total family income	8.580	2.565	9.007	1.959	8.084	3.051
SCHOOL1	Dummy, 1 if some primary schooling, 0 otherwise	0.408	0.491	0.388	0.487	0.430	0.495
SCHOOL2	Dummy, 1 if some secondary schooling, 0 otherwise	0.339	0.473	0.354	0.478	0.322	0.467
SCHOOL3	Dummy, 1 if some college schooling, 0 otherwise	0.186	0.389	0.211	0.408	0.157	0.364
REGION1	Dummy, 1 if Federal Capital, 0 otherwise	0.287	0.452	0.305	0.460	0.265	0.441
REGION2	Dummy, 1 if Greater Buenos Aires, 0 otherwise	0.666	0.471	0.646	0.478	0.689	0.462
REGION3	Dummy, 1 if Greater Mendoza, 0 otherwise	0.046	0.210	0.047	0.212	0.044	0.207
HEALTHS1	Dummy, 1 if feeling physically bad in last month, 0 otherwise	0.092	0.289	0.091	0.288	0.093	0.291
HEALTHS2	Dummy, 1 if any illness in last month, 0 otherwise	0.078	0.267	0.082	0.274	0.072	0.259
HEALTHS3	Dummy, 1 if any accident in last month, 0 otherwise	0.014	0.120	0.017	0.132	0.011	0.105
HEALTHS4	Dummy, 1 if any other health problem, 0 otherwise	0.009	0.099	0.009	0.094	0.010	0.103
CHRONIC	Dummy, 1 if any chronic disease but did not visit doctor in last month, 0 otherwise	0.127	0.333	0.126	0.332	0.128	0.334
SELFEMP	Dummy, 1 if self-employed worker, 0 otherwise	0.255	0.436	0.109	0.312	0.425	0.494
MARRIED	Dummy, 1 if married, 0 otherwise	0.706	0.455	0.728	0.445	0.680	0.466
FAMSIZE	Family size	4.120	1.886	3.991	1.809	4.283	1.966
UNEMPL	Dummy, 1 if unemployed, 0 otherwise	0.074	0.262	0.036	0.186	0.118	0.323
n		7359		4052		3307	

[a] Estimates are calculated using sampling weights to be representative of totals for the surveyed urban areas.

individual. Sindelar (1982) argues that family members may actively participate in the production of each other's health. Thus the opportunity cost and the productivity of other family members' time are important in the decision to seek home and market medical care. The individual will use more home or market care depending on the relative composite price. The data I use in this paper include measures of marital status, number of family members and total family income. Marital status and family composition are also important due to the impact that illness of one family member has on the utility of other members.

Other demographic variables to be considered are age and sex. Medical need is assumed to increase with age. In addition, women generally use more medical care than men. Evidence found for the United States by Sindelar (1982) shows that when utilization is measured as monetary expenditures or physical quantities, women on average use more total medical care and more of each type of care, even after controlling by gynecological and obstetrician care and severity of medical problem.[8]

Estimates of health insurance status equations also usually incorporate the influence and relative importance of various individual and family characteristics, such as age, income, health status and geographical location (Gertler and Sturm, 1997; Hopkins and Kidd, 1996; Cameron and Trivedi 1991; Propper, 1989). These studies try to determine whether adverse (or favorable) selection is present in the insurance market. Selection may have important policy implications for the long-term viability of the health insurance market, in particular for the private segment. Usually, the hypothesis tested is whether the low-risk groups tend over time to drop out of the market as they perceive that the premium is in excess of their probability of loss. However, some of these studies have shown that healthier individuals are the ones who have health insurance, and it is the high-risk who tend to have trouble obtaining insurance, for example because of pre-existing condition clauses (Newhouse, 1996).

5.2 Health status, the demand for health care and health insurance coverage

In the analysis of the demand for health care, health status plays a critical role. The relevance of this issue has been pointed out in the literature several times (Manning et al., 1981; Van der Gaag and Wolfe, 1991; among others). In empirical work, absence or wrong specification of health status may lead to biased estimates. The problem arises because measuring health status is complex and troublesome. Each empirical study has to deal with this problem using a particular strategy since health surveys are unable to collect an objective and unique measure of health status. In general, surveys contain one or more partial measures of health status (e.g., days ill; self-assessed rating of excellent, good, fair, or poor health; functional limitations; etc.). The problem is that such measures tend to reflect primarily short-term health status and may be strongly influenced by what an individual (or the survey's respondent, in the case of a child) perceives to be "good health."

In this paper I use five dummy variables in an attempt to capture health status. Four of them are short-term measures of health conditions which are linked in the questionnaire to illnesses and accidents occurring in the last four weeks. The remaining dummy variable is derived from a question asking whether the individual has a chronic condition and is intended to capture long-term health status.

5.3 Estimation methods

The empirical strategy consists in estimating first the utilization equation alone using OLS. These estimations are performed controlling for health insurance status using either a dummy variable which indicates affiliation to any formal health insurance plan (HI), or a set of dummy variables indicating affiliation to different health insurance plans (OS, PREPAID, MUTUAL, and/or EMERG).[9] Because the decision to purchase private health insurance or in some cases to enroll in a OS is a choice, OLS estimates of (11) would yield biased parameters. The endogeneity of health insurance–either when HI or when a set of dummies for different types of insurance is included in the estimations–requires the utilization of a method which accounts for such problem. Therefore, the two equation relation (9) and (10) is estimated using both two stage least squares (2SLS) and full information maximum likelihood (FIML). These estimations consider only the case of health insurance as a dummy indicating affiliation to any insurance plan. The 2SLS estimations consist of linear relations for both equations. In other words, this method consists of estimating equation (9) as the first stage (the probability of being covered by a health plan), and then in the second stage estimating equation (11) using predicted values for HI. The second method used to address the endogeneity of health insurance is FIML. Because the left hand side variable of (11), i.e. the number of visits to outpatient health care services (OHS), is censored-at-zero and there is a large number of observations with zeros, a censored tobit equation is estimated jointly with a linear probability model for the insurance equation. The estimation alone of the tobit model for equation (11) would also yield biased estimates of HI.

Although the FIML method must dominate asymptotically the limited information one, the simplicity and asymptotic efficiency of 2SLS has made this method widely used for the estimation of simultaneous equations. The current state of available software, however, has eliminated the 2SLS estimation simplicity advantage. Nonetheless, FIML may present problems as well. For instance, any specification error in the structure of the model will be propagated throughout the system (Greene, 1997). Results for both 2SLS and FIML methods are reported along with OLS and tobit estimations for equation (11) alone, i.e. without considering HI as an endogenous variable.

The estimations are performed for two samples: labor force participants, and labor force participants without primary mandatory health insurance. The questionnaire of the MHCUE survey allows me to distinguish individuals that reported a primary mandatory insurance (most of whom are affiliated to OSs). For these

individuals health insurance would not be a choice. Both equations include exogenous variables to measure the effect of age, sex, family income and education. Because of disparities in the geographic availability and cost of health care and health insurance, both specifications also include dummy variables to capture regional differences in demand. I lack of reliable data on health insurance premiums, however the regional dummies may also help to capture some of the regional variation in the cost of health insurance.

After trying different sets of instruments, for identification purposes I use the following variables (i.e., variables which are unique to the insurance equation): industry dummies to account for variation in the availability and scope of health insurance across industries, dummies for self-employed workers (SELFEMP) and marital status (MARRIED), and family size (FAMSIZE). Health insurance is often acquired through family members, thus the probability of being affiliated to a health insurance scheme is likely to increase when an individual is married and when the number of family members is large. Both self-employment and industry are likely to be correlated with availability of insurance, but unlikely to be correlated with utilization.

Variables unique to the utilization equation are four dummies for short-term (current) health status. The first one (HEALTHS1) indicates whether the individual did not feel well in the last month, the second dummy (HEALTHS2) whether the individual had any specific illness, the third one (HEALTHS3) whether the individual had an accident, and finally the fourth dummy (HEALTHS4) denotes whether the individual had any other health problem. I also test whether an employee's occupation belongs specifically to the utilization equation given that occupation may influence injury rates across alternative types of employment (Farley and Monheit, 1985).

VI. Results and Discussion

The estimation results for both statistical relations (i.e., the utilization and the insurance equations) are displayed in Tables 5, 6, and 7. The estimations were performed for the total labor force participants sample, and the total labor force participants excluding those who have a primary mandatory insurance.

The estimation methods reported for the utilization equation are OLS, 2SLS, Tobit and Full Information Maximum Likelihood (FIML) tobit. The last method estimates jointly a tobit equation for the utilization equation and a linear model for the insurance equation. Therefore, only 2SLS and FIML account for the endogeneity of the variable HI. For the insurance equation, OLS results are also reported (they correspond to the linear probability model used as a first stage in the estimation of the utilization equation).

6.1 Health care utilization equation

As noted above, I use two alternative specifications to control for health insurance status (Table 5): a dummy for health insurance status, regardless of the

type of health insurance plan (columns 1 to 4); and a set of dummies which distinguish four different health plans (columns 5 and 6). Results for the first specification confirm that health insurance coverage positively affects health care utilization. Results from Hausman tests show that the null hypothesis of exogeneity of health insurance status can be rejected. For the total labor force sample estimations, the Hausman statistic is 16.63, large enough to be significant at a 1 percent level (1 d.f.). The instrumental variable estimate of equation (11) yields a coefficient for HI larger in magnitude and more imprecise than in the OLS estimation, although still statistically significant (columns 2 and 4). An overidentification test was performed to examine whether the instruments are orthogonal to the residuals in the estimated equation (11).[10] The test statistic found for the model in column 2 was 4.01 (10 d.f.), thus the overidentification restriction cannot be rejected.

The specification which controls for different health insurance plans also confirms the positive influence of coverage on utilization. Three out of four health insurance plans (OS, PREPAID and MUTUAL) have significant and positive coefficients; these are the plans that provide most comprehensive coverage. The estimations, however, are also expected to be biased because the endogeneity of the health insurance dummies vector.

Table 6 reports estimations for the utilization equation but using instead a censored tobit and FIML censored tobit model. The FIML estimation method also gives evidence to reject the null (at $p < .01$) of no correlation between the error terms v and w of equations (9) and (11). Thus, the joint estimation of both equations is appropriate. In contrast, the estimations that do not account for endogeneity–censored tobit estimations in columns 1, 2, 5 and 6–yield coefficients for HI which are biased downward, understating the importance of health insurance in encouraging more medical care usage. Note that HI is biased downward while in studies for developed countries it is usually biased upward. This result reflects the possible existence of positive selection in health insurance markets, i.e., the healthier have higher chances of obtaining health insurance coverage.

Controlling for health insurance status seems to be quite important in explaining variation in OHS. The magnitude of the HI coefficient in the 2SLS estimation for the total labor force (0.30) is close to those found by Cameron et al. (1988) for Australia's demand for doctor visits (0.22 to 0.25). When those individuals who have mandatory health insurance are dropped from the sample, the HI coefficient raises to 0.44 showing the greater importance of moral hazard.

Besides the four health status dummies, which explain much of the variation in health care utilization, OHS is also responsive to age and sex, however it is not responsive to income. This result is consistent with Cameron and Trivedi (1991) who found that income appears to be more important explaining health insurance choice than in determining health care services use. The education dummies–SCHOOL1 for primary schooling, and SCHOOL3 for college, with high school education as the omitted category–both have a negative sign in OLS and 2SLS estimations. This indicates that there may be an inverted U-shaped relation between schooling and health care utilization. In the FIML estimations, SCHOOL3 has a negative sign but is not statistically significant, making it impossible to

TABLE 5

UTILIZATION EQUATION (OHS)
OLS AND 2SLS ESTIMATIONS

Coefficients	Insurance Status (YES/NO)				Insurance Status (Type)	
	Labor Force		Labor Force Without Mandatory Insurance		Labor Force	Lab. Force W/O Mandat. Ins.
	OLS (1)	2SLS[1/] (2)	OLS (3)	2SLS[1/] (4)	OLS (5)	OLS (6)
Constant	.0413 (.0696)	.0101 (.0862)	-.0113 (.0853)	.1098 (.3161)	.0499 (.0684)	.0090 (.0841)
HI	.1703[a] (.0279)	.3080[a] (.0889)	.1839[a] (.0409)	.4430[c] (.2500)	—	—
OS	—	—	—	—	.1534[a] (.0266)	.1023[c] (.0629)
PREPAID	—	—	—	—	.2609[a] (.0411)	.2180[a] (.0454)
MUTUAL	—	—	—	—	.1155[a] (.0767)	.1342[a] (.0926)
EMERG	—	—	—	—	.0082 (.1020)	-.0342 (.1340)
AGE	.0021[a] (.0009)	.0012 (.0011)	.0017 (.0013)	.0001 (.0019)	.0018[a] (.0009)	.0014 (.0013)
SEX	.1203[a] (.0276)	.1051[a] (.0294)	.1850[a] (.0382)	.1666[a] (.0416)	.1205[a] (.0274)	.1798[a] (.0378)
LNINCOME	.0034 (.0051)	-.0101 (.0192)	-.00007 (.0056)	-.0090 (.0343)	.0039 (.0050)	-.0001 (.0055)
SCHOOL1	-.0313 (.0291)	-.0191 (.0310)	-.0095 (.0385)	-.0162 (.0485)	-.0267 (.0290)	-.0123 (.0383)
SCHOOL3	-.0045 (.0359)	-.0482 (.0395)	.0856 (.0524)	-.0155 (.0862)	-.0249 (.0361)	.0752 (.0525)
HEALTH1	.7261[a] (.0411)	.7269[a] (.0426)	.6101[a] (.0542)	.5859[a] (.0574)	.7206[a] (.0410)	.6014[a] (.0546)
HEALTH2	1.2349[a] (.0409)	1.2319[a] (.0453)	1.0809[a] (.0600)	1.0888[a] (.0633)	1.2354[a] (.0438)	1.0773[a] (.0604)
HEALTH3	1.4544[a] (.0952)	1.4613[a] (.0970)	1.2030[a] (.1441)	1.2511[a] (.1473)	1.4468[a] (.0953)	1.1859[a] (.1453)

Table 5 (cont.)

Coefficients	Insurance Status (YES/NO)				Insurance Status (Type)	
	Labor Force		Labor Force Without Mandatory Insurance		Labor Force	Lab. Force W/O Mandat. Ins.
	OLS (1)	2SLS[1/] (2)	OLS (3)	2SLS[1/] (4)	OLS (5)	OLS (6)
HEALTH4	1.0346[a] (.1162)	1.0781[a] (.1223)	.6959[a] (.1473)	.6540[a] (.1613)	1.0208[a] (.1163)	.6997[a] (.1486)
REGION1	.0281 (.0290)	-.0122 (.0313)	.0543 (.0407)	.0195 (.0591)	.0168 (.0287)	.0330 (.0400)
REGION2	-.2115[a] (.0581)	-.2231[a] (.0594)	-.2241[b] (.0787)	-.2314[a] (.0809)	-.2010[a] (.0582)	-.2039[a] (.0780)
UNEMPL	.0066 (.0521)	-.1199 (.0907)	.0779 (.0599)	-.0045 (.0897)	.0062 (.0518)	.0793 (.0598)
OCCUP[2/]	yes	yes	yes	yes	yes	yes
R2	.179	.175	.172	.163	.178	.166
n	7359	7359	3307	3307	7359	3307

[1/] HI instrumented using seven industry, self-employed and married dummies, and family size.
[2/] Eight occupation dummies.
[a] Significant at 1 percent level; [b] Significant at 5 percent level; [c] Significant at 10 percent level.

confirm the hypothesis that more education is associated with higher utilization of OHS. Two different explanations may be driving this result: individuals with higher education assign higher value to the benefits of using health services; on the other hand, education can be correlated with medical knowledge, therefore higher educated people can improve their health more efficiently and therefore use services less often.

The regional dummies indicate the existence of geographical disparities in the utilization of outpatient health care services. The dummy REGION3 (Greater Mendoza) is significant and negative, indicating that residents in that urban area use this type of health care service less. There are several possible reasons for this phenomenon. For example, there may be different regional rationing mechanisms in the public and/or the private sectors, or medical professionals who are less likely to induce higher utilization of such services. This may be an interesting issue for further research given the increasing utilization of cost containment policies and the interest in comparative studies of different public health systems and regulatory frameworks for the private sector.

TABLE 6

UTILIZATION EQUATION (OHS)
TOBIT AND FIML TOBIT ESTIMATIONS

Coefficients	Labor Force				Labor Force Without Mandatory Insurance			
	Tobit		FIML Tobit		Tobit		FIML Tobit	
	(1)	(2)	(3)[1/]	(4)[2/]	(5)	(6)	(7)[3/]	(8)[4/]
Constant	-3.4701[a] (.2421)	-3.4748[a] (.2413)	-2.4103[a] (.4200)	-2.3678[a] (.4123)	-3.5506[a] (.3435)	-3.5687[a] (.3433)	-1.8821[c] (1.1370)	-1.8529[c] (1.1341)
HI	.7885[a] (.0965)	.7753[a] (.0963)	1.5194[a] (.2107)	1.3605[a] (.2078)	.8528[a] (.1526)	.8333[a] (.1526)	2.4328[a] (.9442)	2.2207[a] (.9357)
AGE	.0113[a] (.0032)	.0130[a] (.0032)	-.0011 (.0026)	-.00006 (.0025)	.0096[a] (.0050)	.0110[a] (.0050)	.0012 (.0075)	.0026 (.0075)
SEX	.5734[a] (.0885)	.5842[a] (.0883)	.3547[a] (.0666)	.3649[a] (.0651)	.7580[a] (.1415)	.7681[a] (.1414)	.6045[a] (.1413)	.5447[a] (.1380)
LNINCOME	.0105 (.0171)	.0118 (.0171)	-.0209 (.0467)	-.0131 (.0457)	-.0064 (.0211)	-.0058 (.0211)	-.1500 (.1242)	-.1310 (.1238)
SCHOOL1	-.1764[c] (.0954)	-.1655[c] (.0952)	-.1013 (.0735)	-.0576 (.0723)	-.1035 (.1486)	-.0968 (.1484)	-.1133 (.1858)	-.0233 (.1801)
SCHOOL3	.0693 (.1129)	.0671 (.1126)	-.2245 (.0943)	-.0897 (.0930)	.2326 (.1886)	.2436 (.1883)	-.3334 (.3104)	-.2823 (.3046)
HEALTHS1	2.2190[a] (.1170)	2.2407[a] (.1169)	1.7353[a] (.0862)	1.7789[a] (.0852)	2.1251[a] (.1791)	2.1251[a] (.1788)	1.8254[a] (.1961)	1.6777[a] (.1877)
HEALTHS2	3.1421[a] (.1218)	3.2106[a] (.1228)	2.5044[a] (.0893)	2.5302[a] (.0897)	3.1071[a] (.1917)	3.1641[a] (.1937)	2.7532[a] (.1894)	2.8425[a] (.1890)
HEALTHS3	3.5454[a] (.2454)	3.5554[a] (.2448)	2.8630[a] (.1977)	2.8627[a] (.1961)	3.3715[a] (.4256)	3.3985[a] (.4258)	3.2218[a] (.4509)	2.9801[a] (.4322)
HEALTHS4	2.5088[a] (.2997)	2.5453[a] (.2991)	2.0378[a] (.2370)	2.1624[a] (.2345)	1.9939[a] (.4365)	2.0274[a] (.4366)	1.4190[a] (.4550)	1.6570[a] (.4481)
REGION1	.0370 (.0928)	.0269 (.0925)	-.0179 (.0710)	-.0511 (.0698)	.1372 (.1508)	.1451 (.1506)	-.1311 (.2127)	-.1710 (.2083)
REGION3	-.7106[a] (.1900)	-.6902[a] (.1894)	-.5937[a] (.1494)	-.5664[a] (.1475)	-.8042[a] (.3058)	-.7733[a] (.3055)	-.6821[a] (.2985)	-.8626[a] (.2869)
UNEMPL	.0191 (.1699)	.0251 (.1694)	-.2223[a] (.1302)	.0802 (.1286)	.1628 (.2252)	.1705 (.2249)	.2028 (.2135)	.1912 (.2079)
CHRONIC		-.5708[a] (.1178)		-.4454[a] (.0848)		-.4138[a] (.1810)		-.1783[a] (.1647)
OCCUP[5/]	yes	yes	yes	yes	yes	yes	yes	yes
n	7359	7359	7359	7359	3307	3307	3307	3307
Log-L	6708.68	6696.71	1630.44	1636.76	2676.68	2674.02	1145.17	1145.84

[1/] Jointly estimated with the insurance equation (column 3) in Table 7.
[2/] Jointly estimated with the insurance equation (column 4) in Table 7.
[3/] Jointly estimated with the insurance equation (column 7) in Table 7.
[4/] Jointly estimated with the insurance equation (column 8) in Table 7.
[5/] Eight occupation dummies.
[a] Significant at 1 percent level; [b] Significant at 5 percent level; [c] Significant at 10 percent level.

One of the specifications in Table 6 (columns 2, 4, 6 and 8) includes a long-term measure of health status. Unfortunately, the survey is not rich enough in providing this type of information. There is only one question about whether a chronic disease is present. The coefficient for such variable (CHRONIC) is negative and statistically significant. I would have expected a positive sign, however. I believe that the reason for the negative sign lays in how the question was asked. The inquiry was the following: "Do you have a long-term illness for which you *did not* visit the doctor in the last month?" Therefore, the dummy is only capturing individuals with long-term illnesses who did not use health care services.

The dummy for unemployed individuals (UNEMPL) is not significant in the utilization equation but it is significant in the insurance equation (this result is examined later). Despite the fact that the unemployed are less likely to have health insurance coverage, the usage of health care services is not significantly affected. The easy access of the uninsured to public facilities might be the main reason for such outcome. Finally, the explanatory power of the models of utilization are quite good. This is consistent with other evidence where the precision of parameter estimates is larger for health care services used relatively often (Manning et al., 1987; Cameron et al., 1988).

6.2 Health insurance equation

The estimates of the health insurance equation are given in Table 7. The linear probability model coefficients obtained using OLS (column 1 and 2 for the total labor force sample, and columns 5 and 6 for the labor force without mandatory insurance) and FIML (column 3, 4, 7 and 8) are considerably similar. The probability of being covered by health insurance increases for high levels of total family income. The likelihood of coverage also varies by region. Residents in both the Federal Capital (REGION1) and Greater Mendoza (REGION2) are more likely to have health insurance than residents of Greater Buenos Aires, the omitted category. Only the coefficient for the Federal Capital, however, is statistically significant.

The results for the regional dummies may be explained by differences in provision of health services by the public sector which may in turn influence the type and extent of private and social insurance coverage predominant in regional markets. Argentina has a decentralized public health sector where each province constitutes a "sub-system" with its own financing and health care provision arrangements. It can be said that besides the formal health insurance coverage by social and private schemes, individuals have access to a universal tax-financed public system where excess of demand is rationed by queuing and quality. This means that the provinces have autonomy over the organization and delivery of health services implying potential geographical differences in quality and services available from the public sector. Consequently, differences in the inter-provincial public provision of health services may have led to differences in the size and mix of services offered by formal health insurance (private and social insurance sectors). The queuing/quality problem in public services is likely to differ by

TABLE 7

HEALTH INSURANCE EQUATION (HI)
OLS (1ST. STAGE) AND FIML ESTIMATIONS

Coefficients	Labor Force				Labor Force Without Mandatory Insurance			
	OLS		FIML		OLS		FIML	
	(1)	(2)	(3)[1/]	(4)[2/]	(5)	(6)	(7)[3/]	(8)[4/]
Constant	-.2645[a]	-.2635[a]	-.2573[a]	-.2062[a]	-.9198[a]	-.9163[a]	-.8738[a]	-.9053[a]
	(.0641)	(.0642)	(.0669)	(.0670)	(.0855)	(.0856)	(.0929)	(.0928)
AGE	.0037[a]	.0038[a]	.0046[a]	.0046[a]	.0036[a]	.0037[a]	.0040[a]	.0042[a]
	(.0004)	(.0004)	(.0004)	(.0004)	(.0006)	(.0006)	(.0006)	(.0006)
SEX	.0154[c]	.0151	-.0030	.0008	-.0042	-.0037	-.0115	-.0104
	(.0109)	(.0110)	(.0115)	(.01165)	(.0162)	(.0163)	(.0160)	(.0160)
LNINCOME	.1031[a]	.1032[a]	.0998[a]	.0958[a]	.1186[a]	.1180[a]	.1140[a]	.1157[a]
	(.0065)	(.0065)	(.0068)	(.0068)	(.0086)	(.0086)	(.0092)	(.0092)
SCHOOL1	-.0570[a]	-.0570[a]	-.0587[a]	-.0590[a]	-.0873[a]	-.0876[a]	-.0948[a]	-.0917[a]
	(.0114)	(.0114)	(.0113)	(.0113)	(.0160)	(.0160)	(.0169)	(.0169)
SCHOOL3	.1091[a]	.1090[a]	.1073[a]	.1086[a]	.2538[a]	.2549[a]	.2536[a]	.2525[a]
	(.0143)	(.0143)	(.0173)	(.0173)	(.0220)	(.0220)	(.0201)	(.0201)
REGION1	.0609[a]	.0608[a]	.0556[a]	.0556[a]	.1396[a]	.1394[a]	.1452[a]	.1449[a]
	(.0114)	(.0114)	(.0124)	(.0124)	(.0170)	(.0170)	(.0155)	(.0155)
REGION3	.0268	.0253	.0033	.0083	.0295	.0320	.0211	.0248
	(.0221)	(.0224)	(.0221)	(.0221)	(.0317)	(.0321)	(.0307)	(.0308)
SELFEMP	-.2625[a]	-.2622[a]	-.2688[a]	-.2679[a]	.0296[c]	.0291[a]	.0210	.0207
	(.0118)	(.0118)	(.0117)	(.0117)	(.0158)	(.0158)	(.0161)	(.0162)
FAMSIZE	-.0199[a]	-.0199[a]	-.0204[a]	-.0200[a]	-.0227[a]	-.0220[a]	-.0238[a]	-.0225[a]
	(.0026)	(.0026)	(.0025)	(.0025)	(.0036)	(.0037)	(.0045)	(.0045)
MARRIED	.0724[a]	.0725[a]	.0810[a]	.0791[a]	.0532[a]	.0540[a]	.0550[a]	.0563[a]
	(.0117)	(.0117)	(.0121)	(.0121)	(.0169)	(.0169)	(.0181)	(.0182)
UNEMPL	-.3110[a]	-.3115[a]	-.2996[a]	-.3112[a]	-.0103	-.0128	-.0290	-.0202
	(.0257)	(.0257)	(.0253)	(.0253)	(.0360)	(.0361)	(.0377)	(.0378)
CHRONIC		-.0146		-.0210		-.0345[c]		-.0402[b]
		(.0140)		(.0140)		(.0200)		(.0201)
OCCUP [5/]	yes	yes	yes	yes	yes	yes	yes	yes
INDUSTRY [6/]	yes	yes	yes	yes	yes	yes	yes	yes
n	7359	7359	7359	7359	3307	3307	3307	3307
R2 / Log-L	246	246	1630.44	1636.76	.326	.327	1145.17	1145.84

[1/] Jointly estimated with the insurance equation (column 3) in Table 6.
[2/] Jointly estimated with the insurance equation (column 4) in Table 6.
[3/] Jointly estimated with the insurance equation (column 7) in Table 6.
[4/] Jointly estimated with the insurance equation (column 8) in Table 6.
[5/] Eight occupation dummies.
[6/] Eight industry dummies.
[a] Significant at 1 percent level; [b] Significant at 5 percent level; [c] Significant at 10 percent level.

province suggesting that the expected utility gain from holding private health insurance is greater in some locations than others. Because the social insurance health sector includes multiple heterogenous institutions, the same reasoning can be applied to it.

Health insurance status is also positively correlated with education, even after controlling for income. The same relation is found for marital status. Although the impact of family size on the probability of being insured is small, the sign of the coefficient is found to be negative and statistically significant. The major difference in results between the two samples was obtained for the self-employed dummy coefficient (SELFEMP). This coefficient reflects the institutional fact that these workers are not required to make mandatory contributions to the OS sector; thus when the total labor force is considered, the coefficient is negative and statistically significant. However, when the sample of those without mandatory insurance is considered, the coefficient turns out to be positive and only significant for OLS estimations. The FIML estimations yield statistically not significant results showing that it can not be confirmed that self-employed workers are more likely to look for voluntary health insurance.

In both models specification tests for joint significance of the industry and the occupation dummies were separately and jointly performed. These results allow me to reject the null hypothesis of insignificance at a 1 percent level, therefore both set of dummies do belong to the health insurance equation.

I also tested whether insurance status is affected by the long-term measure of health status. An important reason for trying to use this variable is that it may be a good instrument candidate for identification of the utilization equation. When CHRONIC is used as instrument, the conventional Lagrange multiplier test of overidentifying restrictions gives a result that leads to reject the restrictions. Estimation results including the CHRONIC dummy in the insurance equation give a negative sign for its coefficient, statistically insignificant for the total labor force but significant for those without mandatory insurance. The sign is consistent with evidence indicating that healthier individuals are the ones who are more likely to have health insurance coverage.

Finally, I report in Table 8 elasticities evaluated at the sample means for the demand for outpatient health care services. These elasticities are also calculated for those models that do not account for the endogeneity of health insurance. The comparison shows the magnitude of the bias when the utilization of health care services equation is estimated independently. According to the consistent estimates, a 10 percent increase in the probability of being insured increases the intensity of outpatient health care services use between 3.4 and 5.5 percent.

VII. Conclusion

In this paper I have studied the relationship between health insurance coverage and outpatient health care services. For the first time data for Argentina has been used to study this issue. As was expected, the most important factor determining the intensity of health care services utilization is health status (morbidity conditions). However, after controlling for such conditions, I found that individuals with health insurance (either social or private) are more likely to demand more health care services. These results were obtained considering both samples of total labor force participants and labor force participants without mandatory health insurance.

TABLE 8

EFFECT OF HEALTH INSURANCE COVERAGE ON HEALTH CARE UTILIZATION ELASTICITIES[1/]

	Labor Force	Labor Force Without Mandatory Insurance
OLS	.242	.143
2SLS	.438	.345
Censored tobit	.287	.144
FIML censored tobit	.553	.411

[1/] Calculated at the sample means using the models without the dummy CHRONIC (Table 5 and 6).

The most important factors determining health insurance status are those variables related to the labor market. The condition of being self-employed reduces the probability of coverage, and much of the variation is explained by industry and occupation dummies. Income appears to have an important effect as well. This is not the case for the utilization of outpatient health care services where the coefficient for income is small and statistically insignificant.

When the whole sample of labor force participants is considered, weak evidence about positive selection was found (i.e., healthier population groups have a higher probability of obtaining health insurance coverage). The weakness may be due to the large extent of social health insurance where insurer's selectivity behavior is less likely to occur. However, positive selection appears to be stronger when estimations were performed for the sample of labor force participants without mandatory insurance.

For policy purposes, the expansion of private and social health insurance may have an impact in reducing total public health care expenditures and improving the efficiency of targeting subsidies to the poor. Gertler and Sturm (1997) found for Jamaica that mandatory insurance induces covered individuals to opt out of the public sector in favor of the higher-quality private sector. It is not clear whether this would be the case in Argentina because in some regions, public facilities are better equipped than private ones in terms of medical technologies and human resources. Another issue which is not addressed in this study and will require further studies is related to the impact of possible changes in the public sector pricing policies. The introduction and expansion of fees and cost recovery policies for services rendered to OS' affiliates can contribute to increase revenues and permit to focalize the expenditure in population groups at risk.

Future research should include the study of the relation between specific insurance types (i.e., private and social insurance) and not only outpatient health care services but other measures of utilization as well (for instance, hospitalizations and visits to the dentist) given that they may show different responsiveness to insurance status. Another important issue to explore is the interaction between private and social insurance, particularly because the policy reforms are intended to avoid over-insurance and to eventually merge these two markets.

The estimations were performed using specifications which lack a price variable because it is not contained in the data. Most of the studies in the literature do not include price because it is difficult to obtain and the interaction with health insurance distorts the effective price that consumers face. The strategy of proxying price using health insurance characteristics should be refined in order to obtain more meaningful results. The goal should be to distinguish the net effect of price variation from the pure moral hazard effect.

Notes

1 This section has been drawn from Katz and Muñoz (1988), Katz et al. (1993), Queisser et al. (1993), World Bank (1993), Panadeiros (1996), and Bertranou (1997).

2 The OS sector is the core of Argentina's health system: it consists of about 300 individual insurance funds, accounts for about $ 7 billion a year in spending –nearly 3 percent of the GDP–, and covers about 18 million individuals or 60 percent of the country's population. The OS are organized around principles of solidarity and income distribution, i.e. uniform health coverage financed with contributions proportional to income. Each OS pools risk among its members; there is no pooling across OS, and thus, no inter-industry/occupation transfers from better-paid to poorer-paid workers. The social insurance health organizations are financed by employees' and employers' contributions following principles of social insurance where there is no direct link between contributions made and benefits received from the system. Employees can extend coverage to family members and dependents. Until the 1997 reform, the insured were not allowed to choose among OS but automatically belonged to the fund linked to their occupational union association. This organization has led to great variation in membership, coverage and services provided by each OS.

3 Approximately 3.5 million individuals hold private insurance (10 percent of the population), where 60 percent is contracted individually and the remaining corresponds to health insurance provided by firms and supplementary coverage. There are roughly 200 private pre-paid health insurance institutions, however, without an effective regulatory framework. The sector accounts for approximately $ 3 billion in annual transactions (almost 1.3 percent of GDP).

4 This system is administered at the provincial level where each province has its own health facilities network organization. There are limited mechanisms of coordination among provinces, and between them with the OS sector and the private health insurers and providers.

5 The Rand experiment may have solved the self-selection problem of health insurance data but it could have introduced other distortions in demand. For instance, depending upon how income effects operate, the lump-sum transfer to compensate any adverse result from having a low coverage health insurance may have affected the slope of the demand curve for health care. Another critique is related to the health stock-demand approach by Grossman (1972): the experiment itself may have changed behavior in building or preserving individual's or family's health stock during the experiment. Thus, some individuals may have overinvested in health stock during the experiment while others –with less comprehensive coverage– may have delayed investment decisions.

6 *Rate of utilization* for a population group is defined as the proportion who used at least one time outpatient health services during the time-period surveyed (for instance, during the last month).

Intensity of use is defined as the number of outpatient health care visits during the time-period surveyed.

7 A referee suggested that the model contributes to explain only the behavior of self-employed workers because for them social insurance is not mandated. However, I believe the model still helps to explain the behavior of non-self-employed workers because they may still have the choice of evading social security contributions. If mandated social insurance were completely enforced, all non-self-employed workers should be covered by an OS, but only 65.7 percent hold this type of coverage (see Table 1). Some of these workers opt out of social insurance and are still covered because they buy private insurance.

8 The exception is hospital care where women have higher rates of utilization (i.e., they are more likely to enter to the hospital), however, they stay on average fewer days than men once in the hospital. Similar evidence for Argentina is presented in Aedo and Bertranou (1993).

9 They are not mutually exclusive. See Table 4 for variable definitions.

10 The test is based on the Lagrange multiplier principle; the statistic is (nR^2), where n is sample size and R^2 is the uncentered R^2 in the regression of the residuals ($OHS - OHS_{OLS}$) on the instruments (industry dummies, family size, marital status and self-employed dummies). The test statistic has an asymptotic chi-squared distribution.

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