Cost effect in the choice of healthcare provider in a mixed system

The case of Mexico

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Abstract

This paper shows that, in Mexico, the decision of attending to a private health facility versus a public one is mainly determined by the time of transportation. In our study, we analyzed data from the National Survey of Health and Nutrition (2012) in Mexico to estimate the likelihood of attending to a private clinic using a Linear Probability Model. Another remarkable finding is that consultation cost is not a

determinant factor due the low economic cost of receiving medical attention by private doctors in pharmacies. Our results also suggest that a health reform should focus on improving the physical availability (proximity) of public health care centers.

Keywords: public versus private health care, health care reform in Mexico.
JEL Clasification: I13 Health Insurance, Public and Private; J18 Public Policy

I. Introduction

In developing countries, public healthcare is a fundamental tool to guarantee that the whole population has access to a fundamental right, such as health. Therefore, it is important to understand what kind of incentives make agents to choose attend to a private health facility when a public one is available, and almost free (monetary cost). This research will analyze the likelihood of choosing a private healthcare provider in Mexico, based on the effective economic cost paid per medical consultation. This study is especially relevant in a country with both public and private health care systems.

Mexico has a mixed healthcare system. Presumably, some part of the population is able to choose between paying a fee per a consultation and getting a consultation for free in the public health facility. But, how much is the people willing to pay for medical attention? It would be reasonable that the price of the health service influences the decision of going to the private or the public system. To study this decision, we will use data from the Mexican National Healthcare and Nutrition Survey 2012.

The central question of this research is: how relevant is the economic cost in the decision making process between a private and a public clinic in Mexico? For this aim, we will consider cost measured both as time and money spent in commuting as well as money per consultation. The central hypothesis is that if there are no restrictions to affiliation and quality is distributed similarly between public and private systems; most of the people will prefer the "free" service, unless the public system is not "free". For instance, in the public system, the waiting time can be long, the clinic can be very far, or it can be costly to arrive. Then, by studying this decision, this research will help to realize whether a structural health reform is needed and on what it shall focus.

The paper is organized as follows. First, there will be a brief description about the Mexican Healthcare system. Then, a brief review of the literature about how the system works will be presented. In the third part, the data will be described. In the following section, the results will be discussed. Finally, some of the policy implications of these findings will be addressed.

II. The Mexican Healthcare system

Mexico has health systems provided by both public and private sectors. The public one divided itself into branches and those branches are mutually exclusive among

them, and most of the time, they can be used only by registered people. The largest are IMSS, for affiliated workers of private companies, and ISSSTE for government workers; but there are also local public health branches. In order to provide an idea of how big they are, in 2013, IMSS reached 58 million people and ISSSTE 12 million people (Presidency of Mexico, 2013).

As a matter of fact, in Mexico, during the last thirty years the informal market in the country grew faster than the formal one. In order to reduce costs, some companies hired personal without social security. As a response, in 2004, the Federal Government launched the Popular Insurance (Seguro Popular), with the objective to provide health insurance to 50 million children and adults that were in families with non-formal workers' members. These factors incited that Mexico achieved universal social security in 2012, according to Federal Government.

Despite the fact that the coverage has been extended nationwide, the public system still has a lack of customer-based service. Complains about the lack of quality in the attention as well as paper work load are commons. Thus, many companies offer exclusive private insurances for their employees to receive attention in private clinics. Another situation is that poor and rich people face different problems paying for their health. In 2005, for instance, the catastrophic expenses (more than 20% of the income is spent in health) among the lowest income sectors were explained by the cost of medicines, but for rich people the main cause was hospitalization (Perez-Rico et al, 2005).

The bad service in the public system also deals with the expansion of cheap options in the market. For instance, in 2002, the cost of a basic private consultation was around 30 USD. In that year, the private company Farmacias Similares expanded its operations opening thousands of pharmacies all over the country, providing low rates medications and medical consultations per 2 USD. This dropped the prices of primary health services in Mexico. In 2007, Farmacias Similares gave 4.5 million consultations while the IMSS provided 8 million. Nowadays, there are at least six companies providing consultation from no rate to three dollars. (Chu et al, 2007). Even though the private system has expanded recently, the best hospitals still belong to the public system. The Army, for instance, manages several hospitals where the Presidents, the officials and registered public receive a high quality attention.

The healthcare system, where many subsystems exist is peculiar in the OECD countries. As the OECD reports, the public sector serves different part of the population and with little connection between them. Poorer households are less well covered by social insurance than richer households and a larger share of the poor also face catastrophic and poverty-creating health-care expenditures. With voluntary enrolment in the Seguro Popular, states have an incentive to affiliate as many families as possible and this should also encourage them to provide more and better quality services (OECD, 2005). As the next section will present, there are a few researchers that have tried to know more about how this system works and what should be done to improve it.

III. Literature Review

The decision making process within the coexistence of two health systems has been analyzed in cross-national data. For example, Bastida (1998) documented that a free healthcare system is related with more people accessing to health services, at least for border residents of the US who preferred to commute to be attended in Mexico before the expansion of Medicare. This study also found that in cities close to the border, Mexican-American families (who presumably could choose between the public sector in Mexico, and private sector in the US) were more likely to have no insurance. Also, those household incomes between 7000 and 30000 were more likely to visit a doctor in Mexico than in the US.

In a study about the Mexican systems and subsystems, Laurel (2007) mentioned that the public and private sectors are very different, "those with a formal job and their families (about 50 percent of the population) have free health services offered by the social security institutes at their own integrated health facilities with salaried staff and a geographic distribution fairly congruent with the number of insured persons. This contrasts sharply with the conditions of access for the uninsured population that faces a variety of obstacles to accede to required health care. The main one is economical since it has to pay for almost all medical services and drugs which frequently mean that necessary care is postponed among the poor."

In another study, Puig (2009) analyzed the differences in perceived quality among public and private institutions with survey data of 2006. The author examined how the users of each system perceived the quality, finding that quality was more related with assistance to private sector. Respondents who received health care services at IMSS and ISSSTE facilities were less likely to rate the quality of health care obtained as good or very good than those attended at private facilities. Other researchers in Mexico have also addressed the quality. For instance, Barber (2008) found that patients receiving care from private providers and non-medical personnel received lower quality prenatal care than what is recommended in clinical guidelines. However, those models did not include any variable related with the amount of money paid for the medical attention, even though that a higher education achievement (a proxy of income) was associated with the use of private providers.

What is the relevance of the way people choose the system into the public policies discussion? Levy (2005) argues that the healthcare system is a fundamental column of the Mexican welfare policy, where such other programs as Conditional cash transfers. Also, that the system by itself is related with the mobility of the society. The worth of maintaining such a system with so many subsystems has been a recent public discussion. For instance, Levy (2010) argued that the public system based on quotas should disappear because it promotes the informal work. Besides the subsystems should be integrated into a single institution financed with a consumption tax. Eventually, this will drop the attendance to the private sector. Finally, the idea of getting universal coverage has also been criticized by some authors. For instance, Leal (2011) argues that

universal coverage is more associated with inefficiency rather than with real changes to the social welfare schemes.

These studies prove that understanding how people choose going to the private system is important, especially to know what are the challenges of healthcare public policies. In the next section, the data for this study will be described in order to present how reliable is the information analyzed.

IV. Data

Since the late 80's, the Mexican government has implemented the National Survey of Nutrition and Health (ENSANUT). The last edition available was done in 2012, and it provide us with the data to test the hypothesis of our research. 2012 is the first edition since it was announced that universal healthcare insurance was achieved in Mexico. The ENSANUT looks to quantify the frequency, distribution and tendencies of the conditions and determinants regarding the health and nutrition in Mexico. These include the coverage and quality of the health services.

The sample is a randomized survey with national representativeness, for both rural and urban areas. Questionnaires were collected between October 2011 and May 2012 and data was released in December 2013. The survey interviewed one person in each home that belong to the following age groups: 0-4; 5-9; 10-19; >20; and, recent users of the health services. Information collected includes weight, size, hemoglobin levels and arterial rate (among selected individual), also, blood samples were used to measure nutriments, antibodies and health conditions in adults.

Therefore, questions are asked at an individual level. The size of the sample is 96,031 questionnaires answered in 50,528 houses. The 50,528 houses represent the more than 29 million of houses in Mexico. As average, 3.89 individuals habit each house in the sample, a similar average than the 2010 Census (3.91 individuals). For this study, a sample of 14,104 users of health services was considered. This subsample consist of people who recently used health services. Then we can focus on: general respondents and their probability to go to private or public sector; users that have gone to private or public sector, and, characteristics that determine assisting with each provider.

V. Results

Descriptive statistics and construction of variables

The survey asked if respondents received medical consultation in the previous two weeks. As it can be seen on Table 1, the information of this variable determines the subsample considered for the further steps. In total, from the 14,104 respondents of this subsample, 13,187 answered that they needed to receive medical attention. Also, the same reference provides the total number of people that effectively received attention, which represents more than 13 thousands of individuals.

Table 1. Subsample

Question / Answer	Total	With missing	Without missing
U101. Excluding hospitalization, in the last two weeks, did you require or receive medical consultation			
Yes	13,187	93.50%	93.52%
No	913	6.47%	6.48%
NS/NR	4	0.03%	
Total	14,104	100%	100.00%
U302. Did you receive attention?			
Yes	13,059	92.59%	99.05%
No	125	0.89%	0.95%
NS/NR	3	0.02%	
Blank	917	6.50%	
Total	14,104	100.00%	100.00%

Source. Elaborated by the authors with information from ENSANUT 2012

In our study, as we are attempting to understand the probability of going to the private sector, we constructed a dependent variable with a dummy that equals one if people went with a private doctor. For this purpose, we used the information provided in Question u401 of the questionnaire: "Where did you go to the doctor?" The descriptive statistics of this question are on Table 2 and Graph 1.

In the ENSANUT, most of the answers were coded as categorical variables, according to each institution that could provide attention to any person in the sample. The categories "Pharmacy" and "Private Doctor" were both coded as Private. We threated the "Other" category as missing values (Table 2 & Graph 1).

As a result, to construct our dependent variable, we assigned a value of 1 to Pharmacy and Private; and a value of 0 (Public sector) to IMSS/ISSSTE/Local ISSSTE/ Pemex/ Defense/ Marine/ Secretary of Healthcare/ IMSS Oportunidades. The distribution of attendance to public and private sector is presented in Graph 2 and Table 3.

Data Analysis. T-tests

A first approach to analyze the difference between the public and private sector was to understand if they were effectively different. We perform a t-test to see if the mean price of the public sector was different from zero. The results are presented in Table 4. However, as the p-value is 0.00, the null hypothesis that people paid no money for the consultation even in the public clinics is rejected. So our result suggest that people might have paid a fee for the consultation, but the average cost in public clinics is 11 Mexican pesos (less than one dollar).

As a second step, we analyzed if there was any statistical difference between the

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Table 2 & Graph 1. Distribution of health providers

U401. Where did you receive medical attention?		
		32.35%
Pharmacy	1,627	11.54%
Defense	19	0.13%
IMSS-Oportunidades	259	1.84%
ISSSTE	413	2.93%
Local ISSSTE	204	1.45%
Marine	17	0.12%
Private doctor	2,612	18.52%
Other	389	2.76%
Pemex	35	0.25%
IMSS	2,921	20.71%
(blank)	1,046	7.42%
Total	14,104	100.00%
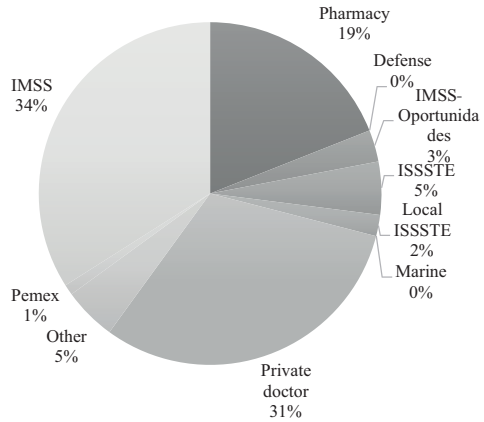
Source. Elaborated by the authors with information from ENSANUT 2012

Graph 2 & Table 3. Private and public sector
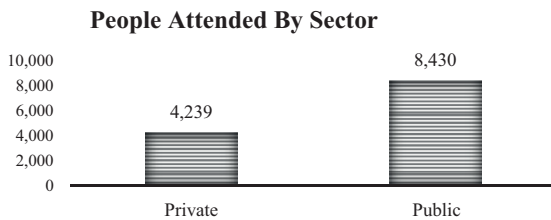
Attention in private clinic	
Private	4,239
Public	8,430
Other	389
Blank	1,046
	14,104

Source: Elaborated by the authors with information from ENSANUT 2012

amounts paid in private and public clinics. This is relevant because if the values were the same, this research would lose its explanatory power. Nevertheless, as Table 5 shows, the means were different. The average paid in a private clinic is larger than the one in the public clinics: 189 pesos (14 USD) for private clinic and 11 pesos (0.8 USD) for a public one (Table 5.).

Data Analysis. Model

To understand why people might go to a private clinic instead of a public one (that is cheaper, at least monetary speaking), we will use the indicator variable for the use of private sector as dependent. As it is a dummy, the econometric model can be a Linear

Table 5. Test of the difference in means

The people in public and private sector paid the same amount for the consultation?

Private	sample size (n1)	4239
	mean (μ 1)	189.476
	SD (S1)	492.529
Public	sample size (n2)	8430
	mean (μ2)	11.299
	SD (S2)	18.465
Results	Variance (Pooled)	81388.398
	SE (Pooled)	285.287
	t (cal)	-33.170
	degrees of freedom	12667
	p-value	0.000

Source: Elaborated by the authors with information from ENSANUT 2012

Probability Model (LPM). We are aware that given the size of the sample, it could be accurate to use logit/probit models, however this is the easiest way to estimate the effects. In addition, as it will be shown in Table 7, the value of the predicted probabilities are very likely to fall between 0 and 1. Besides, the unit of observation is an individual but the sample includes individuals that belong to the same household, and the probit/logit model assumes that the observations are independent.

In our model, we included the cost paid by consultation as a predictor of the private or public sector. The most intuitive approach is that people would avoid really expensive private providers if a free consultation were available. Therefore, a variable that needs to be included is the total amount of money that was paid per consultation (public and private).

However, there are more costs associated with going to consultation. Presumably, some people would have preferred to pay the cost of a private provider if commuting to a public clinic is expensive. To control this effect, a variable that asks for the money invested in transportation will be used. Finally, in some areas the time should be more valuable than the money. For instance, the Metro Station of Mexico city has a cost of 5 pesos (less than 0.40 USD) and one person can virtually cross the city using it, but some people spend up to three hours in a one-way trip. Thus, a variable of the amount of time that was used to commute was also included. As control, we included variables as age, gender and type of zone (Table 6).

The results of our model are presented in Table 7. As it can be seen, almost all the variables are significant. The main finding is that our intuition is correct, private choice of health care is influenced by its costs associated. However, and perhaps surprisingly, on average, the decision to attend to a private clinic is almost not affected neither by

Table 6. Variables used

Type of variable	Description	Categorization
Dependent	Attendance to a private clinic	1= Attendance in private clinic 0= Attendance in public clinic
Independent	Moneydoctor.	Value in pesos. How much did you pay for the medical consultation?
	Moneyarrive	Value in pesos. How much did you pay to arrive to the place where you received medical attention?
	MinutesTransport	Value in minutes. How many minutes did you spend to arrive to the place where you received medical attention?
Control	Age	Measured in years.
	Gender	Dummy. Male
	Location	Metro/Urban/Rural

Source: Elaborated by the authors with information from ENSANUT 2012a

the consultation cost nor by the money invested in transportation but by the time that it takes to arrive to the health facility.

Unfortunately, a limitation of our data is there are not variables to control by socioeconomic characteristics. Then, we cannot distinguish whether the effect is heterogeneous by income level, for example. This limitation might be addressed in future studies with a more complete dataset. Nevertheless, we consider that the small value of the coefficients of consultation cost and money invested to commute might be related with the fact that many pharmacies provided low cost consultations, as we mentioned before.

The fact that the coefficient of commuting time (MinutesTransport) is negative suggests that when people does not have a nearby private option (for example, a pharmacy) available, they are more likely to attend to a public clinic. Also, the fact that people in rural areas are less likely to attend to a private health care it might be due the lack of availability of private facilities in those areas (Table 7.).

It can be argued that money invested to arrive is very small due to the following: if people needs to expend some money in transportation to arrive to a private facility, probably they will also need to expend (even more) money to commute to a public health center. Therefore, people might consider that transportation is a fixed cost, and almost irrelevant to their decision.

There might be other factors that explain the decision we are studying. For instance, the quality factor presented in the literature review. Under that setting, people that went to the private sector would be more likely to pay a big cost in order to avoid the presumably bad attention of the public clinics. However, we think that, due to the

Table 7. Results of the model

	Coefficients	*S.E.*	*t Stat*	*P-value*
Intercept	0.405098	0.011909	34.014745	0.000000
MinutesTransport	-0.001669	0.000350	-4.768422	0.000002
MoneyArrive	0.000065	0.000025	2.555867	0.010604
Money_doctor	0.000340	0.000012	28.751606	0.000000
Age	-0.002918	0.000158	-18.527420	0.000000
Male	0.036587	0.008221	4.450235	0.000009
Metro	0.074030	0.010399	7.118690	0.000000
Rural	-0.073244	0.011089	-6.605160	0.000000

Multiple R	0.328193064
R Square	0.107710687
Adjusted R Square	0.107138376
Standard Error	0.45854515
Observations	12669

Source: Elaborated by the authors with information from ENSANUT 2012.

huge amount of variance in the quality of the public health care system, and the usually people in the public system cannot choose their doctors, quality should not been a relevant factor. On the other hand, an important limitation of our study is the lack of a variable related with income. Presumably, people with higher income will have greater opportunities to decide which service they prefer. Nevertheless, we do believe that the fact that money is not relevant for attending to a private clinic for the whole sample, suggest that it will be even less relevant for only the richer people.

Finally, our approach might be flawed in the composition of the dependent variable. Perhaps, it will be more informative to divide the different subsystems; for instance, we could create a categorical dependent variable with different values if the individual went to the IMSS or ISSSTE. However, as we suggested above, a probit (or ordered probit) is not recommended due to the lack of independence between observations.

VI. Conclusion and implications

Although a "free" public healthcare systems in a development country seems important, empirical analyses of whether it satisfies the needs of their users are rather scarce. First, we establish some hypothesis of why people might choose to pay for private attention when public healthcare is available. We argue that the increase of private facilities, mainly by chain pharmacies, helped to reduce the cost of medical consultation.

The main conclusion of our research is that cost (in time) affects negatively the probability of choosing a private healthcare provider in Mexico. However, the impact is extremely low, and presumably other factors influence more the decision of avoiding the visit to a public and free clinic. An unexpected result of our empirical analysis is that

the cost of consultation and the money invested in commuting are almost not important to decide whether to go to the private or public health facility.

An extension of this research will be to study the factors the might determine a switching between public and private healthcare. Is there a person that uses a private facility for some diseases but a public one for others? Do bad experiences contributes to a switch? That it, what is the likelihood that a person that is currently using the public systems change to the private one? Is it the likelihood similar for a private to a public switching?

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