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Health care utilization among older Mexicans: health and socioeconomic inequalities

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Abstract

Objective. To examine the determinants of the utilization of health care services among the population of older adults in Mexico. Three types of health care services are analyzed: preventive care, visits to the doctor, and hospitalizations. **Material and Methods.** Data was used from the 2001 Mexican Health and Aging Study (MHAS/ENASEM) and estimates were made using multivariate probit regression methods. **Results.** Socioeconomic factors, health conditions reported by the individuals, and the availability of health insurance are significant determinants of the differential use of services by older adults. **Conclusion.** Specific health conditions are important determinants of use of the various types of health care services. For all three types, however, the availability of health insurance is an enabling factor of health care use. Older age is associated with greater propensity to use health care services but its effect is small when controlling for health conditions.

Key words: utilization; services; aging; health; Mexico

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Resumen

Objetivo. Examinar los determinantes del uso de servicios de salud de la población de adultos de 50 años de edad o más en México. Se analizan tres tipos de servicios de salud: cuidados preventivos, visitas al médico y hospitalizaciones. **Material y métodos.** Se usan datos del Estudio Nacional sobre Salud y Envejecimiento en México (MHAS/ENASEM) del año 2001 y se aplican métodos de regresión multivariada probit. **Resultados.** Factores socioeconómicos, las condiciones de salud reportadas y la disponibilidad de derechohabiencia son factores determinantes de la propensión diferencial a usar servicios entre la población. **Conclusión.** Diferentes condiciones de salud están asociadas con el uso de los varios tipos de servicios de salud. Para los tres tipos, sin embargo, es primordial la derechohabiencia a servicios de salud para fomentar la utilización de servicios. Asimismo, mayor edad se asocia con mayor uso de servicios pero su efecto es pequeño una vez que la salud se toma en cuenta.

Palabras clave: utilización; servicios; envejecimiento; salud; adultos; México

Population aging is expected to accelerate in Mexico after the year 2000, a pattern that characterizes most Latin American countries. Unless there is an improbable increase in fertility or in old age mortality to offset this momentum, the percentage of the population aged 60 or older will increase from 7% in the year 2000 to 12% in 2020 and 28% by 2050.[1] The changes in the relative and absolute size of the older population in Mexico are occurring during a period of "epidemiologic polarization," that is, mortality regimes under which both infectious and chronic diseases are simultaneously prevalent.[2,3] Levels of infectious diseases among the elderly are higher than would be predicted from observed levels of chronic illness.[4]

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This means that the Mexican aging process is affected by an unusual interaction of chronic conditions associated with modern health and mortality risks and conditions that are residual to a transitional regime. The aging processes under these peculiar conditions may be such that the set of symptoms, physical limitations, and functional disability would be expected to be higher in Mexico than the developed world or less developed economies, with implications for active life expectancy and the volume of demand for health care. The consequences for the Mexican social system that these conditions impose are uncertain. Adjustments may include the adoption of therapeutic treatments to deal with the burden of chronic disease, even as overall levels of public health expenditures get reduced.[5,6]

Towards the end of the 1990's, social security institutions with health care services covered almost half of the Mexican population, institutions for the uninsured covered 40% of the population, 5% used private services, and 11% had no access to the health system's facilities.[7] Private pharmacies are a major source of informal care; pharmacists generally prescribe medicines and treatment in Mexico. According to the 2000 Mexican Population Census, about 50% of the population aged 65 or older reported to have no health-care-coverage.[8] The provision of health services is largely the responsibility of the public sector. The Mexican government uses general revenues to pay for health care for middle- and low-income groups in the population, while upper income households (a minority) use private insurance or resources to pay for private health care. Coverage by the social security system is determined largely by participation in the formal labor market; hence, this system tends to discriminate against agricultural workers and those living in rural areas, domestic workers, and small commercial industry workers. These tend to also be among the poorest sectors of the population. Once a worker is covered by social security, however, his/her dependents are generally extended the benefit of health care.*[7]

This brief summary suggests that in Mexico, the population has access to health services based on two main factors: the level of urbanization of the community of residence and whether there are services available in it, and whether or not the population forms part of the social security system. Given this system of provision of services, we would expect that health care utilization would exhibit large variances across the population, and this is supported by the literature, which indicates that utilization of health services differs vastly by income groups in Mexico.[2,9] Under this set of conditions, it is reasonable to argue that the population of Mexico, in particular those with low socioeconomic status (to which rural residents tend to disproportionately belong) are likely to have low exposure to the formal health sector, and may have a culture of not seeking formal care in case of illness.

In addition, health inequalities across the Mexican population have been well documented.[3,10,11] These are profound differences that prevail, as there are vast differences in the social and economic conditions and access to health services among the population. As an intermediate factor that determines health, the patterns of health care utilization may determine to a great extent the large health differences. Understanding the patterns of health care utilization may contribute to better understanding of the health differences across population groups. In this paper, we compare the patterns of health care utilization among populations aged 50 and older in Mexico, controlling for aspects of health, access to health insurance, and the economic and sociodemographic characteristics of the individuals. This comparison shall shed light on the possible mechanisms through which health differentials are obtained. This is done for three service utilization outcomes: preventive care, doctor visits and hospitalizations. These three outcomes were selected because they should be sensitive to availability of health insurance in different ways, given that their relative out-of-pocket cost and their perceived need are quite different.

The overarching hypothesis of this research is that there will be vast differences in the patterns of use of health care services across the population according to sociodemographic attributes such as age, gender, and education. It is expected that, although sociodemographic characteristics will determine the propensity to use health care services, a dominant factor for the use of services will be the health needs. In addition, we expect that sociodemographic factors and health needs will affect the propensity to use services differently, depending on the type of services. For example, regardless of chronic conditions reported by individuals, a higher likelihood of use of preventive services by women than men is expected because older women have had more contact with the health system in their lifetime through their own reproductive health experiences, as well as through the use of health care for their children.[7,12] It is expected that older adults living in urban areas will tend to use health care services more than their coun-

* Recent changes have been implemented in the Mexican public health system, starting in January 2004. Under the proposed reform, a "popular health insurance" (seguro popular) is available to all the population, but the implementation will be gradual and it is too early to assess the impact of the reform on the health care coverage of the overall population.

terparts residing in rural areas because of better access to health facilities.[13] And it is expected that the role of health insurance coverage will be highly relevant to the use of health services, in particular preventive care and hospitalizations. This is because preventive care is optional and older individuals may choose to forgo the use of preventive care unless it is available at a low cost. Regarding hospitalizations, while not optional in the case of catastrophic care, the relative high cost of hospitalizations and the lack of low-cost alternatives in the private sector may render hospitalizations prohibitive unless there is health insurance coverage for the population. On the other hand, it is expected that given that there are low-cost alternatives in the private sector for doctor visits, the role of health insurance in using this type of services will not be as important as in the other two types of services.

Material and Methods

Data was used from the 2001 Mexican Health and Aging Study (MHAS/ENASEM). This is a nationally representative, prospective panel study of individuals aged 50 and over in Mexico as of 2000.* Interviews were sought with spouse/partners of sampled persons regardless of their own age. Data were collected on multiple domains of health: demographic traits, including the migration history of respondents, their parents and offspring; family networks and transfers exchanged; some work history; income, assets, and pensions; and aspects of the built environment. States with high rates of emigration to the U.S. were oversampled. Baseline interviews were completed with about 15 200 respondents in 2001, with a follow-up in 2003. The institutional review board of the Universities of Pennsylvania, Maryland and Wisconsin approved the survey protocol, according to the ethical principles for medical research with human subjects of the Helsinki Declaration. The personnel of the Instituto Nacional de Estadística, Geografía e Informática (INEGI) in Mexico gathered the data. The informed consent of study participants was obtained and the rights of the informants were guaranteed according to the Ley de Información Estadística y Geográfica de México, Chapter 5, Article 38. For further details on the study, please see Wong, Espinoza, Palloni.[14] For the purposes of this paper, data was used from the baseline survey gathered in 2001, and individuals aged 50 or older who completed a direct interview were selected, with a sample size of about 12 400 individuals.

Probit regression methods were used to estimate the probability of seeking health care across comparison groups. The following explanatory variables were controlled for, and at least the following factors were covered (the variables are listed in parentheses):

- Preferences for health and health care *(gender, education).*
- Factors that enable the utilization of services and production of health *(income, education).*
- Prices or indicators of access to health services *(availability of health insurance, urban/rural area of residence).*
- The need for health care services *(age, type of health conditions reported).*

Dependent variable: health care utilization

The regression models were estimated for three different dichotomous dependent variables (yes/no) of health care utilization: preventive care, doctor visits and hospitalizations. Preventive care refers to the use of at least one of the following medical exams or procedures: vaccination against tetanus, blood test for cholesterol, and tests for tuberculosis, diabetes and high blood pressure. Additionally, it includes the use of vaginal or breast cancer examinations for women, and a prostate examination for men. The reference period for these exams and procedures is the last two years. It is acknowledged that the aggregate (yes/no) measure has the limitation of referring to different preventive services for different groups of the population. The measure intends to capture contact with the health care system for preventive purposes. Use of doctor visits refers to whether the individual visited a doctor's office at least once during the last 12 months. Use of hospitalizations refers to whether the individual reports to have spent at least one night in a hospital during the 12 months prior to the interview.

Explanatory variables

Standard demographic variables were used such as age in three categories (50-59, 60-69 and 70 or more), gender (male/female), current marital status in four categories (married or cohabitation, single as never-married, separated or divorced, and widowed), and years of education in four categories (0, 1-5, 6, 7 or more). As a measure of income, the individual total income was used if the person has no spouse or partner, and the couple's income divided by two was used if the person

* The data and documentation can be obtained from http://www.mhas.pop.upenn.edu.

is married or cohabitating and currently resides with the spouse.[15] This total income is coded in three categories (low, medium, and high). A dummy variable was used for availability of health insurance (considering an individual as covered if a person reported to have public or private health insurance).* The MHAS/ENASEM study classification of urban/rural residence was adopted, which defines urban areas as those with 100 000 people or more or state capitals; the rest are considered rural.

The measures of health status included in the model are: a) self-reported health in four categories: excellent/very good, good, fair, poor, b) self report (yes/no) of having limitations with at least one activity of daily living or instrumental activity of daily living, and c) separate self-report (yes/no) of having been diagnosed with the following chronic conditions: diabetes, heart disease, stroke, cancer, and lung disease. Self-reports of diagnosed chronic conditions have two limitations worth mentioning. First, the diagnosis of the conditions needs to have been made, and this is subject to access to diagnostic tests, which implies access to health care services. Second, the report is subject to recall error, since the respondent may be confused about the exact diagnosis, or does not know exactly whether the specific condition was diagnosed. In general, given the low access to regular health care services and the relatively low level of education of the studied population, it is expected that there may be under-reporting of the chronic conditions. However, the models in this study control for availability of health insurance, which takes into account differential access to health services and diagnostic tests; and education, which takes into account, albeit partially, the possible differential recall error. There is confidence that by including self-reported overall health, disability, and chronic conditions in the models most of the variation in use-of-services that is associated with the health care needs of the individuals is being captured. Past research has shown that self-reported overall health is a powerful indicator of health care needs, and it is associated with a range of conditions in addition to the group of chronic conditions that are highlighted; for example, aspects of mental health and satisfaction.[16]

Predicted probability of utilization

To highlight the inequality in the use of health care services, the results of the basic regression model were used and the estimated probability of using health care was calculated. This means that holding all other variables constant (in particular health conditions and socioeconomic characteristics), these are the patterns of use of services for various groups of interest: men, women, with/without health insurance, and for residents of rural/urban areas.

Results

Table I shows the distribution of self-reported utilization of health care services for the three types of services according to age group, urban/rural residence and gender, for individuals aged 50 or older who live in the community in Mexico. Overall, the unadjusted patterns of utilization are quite evident for visits to the doctor and hospitalizations: those residing in urban areas tend to use health care services more than the rural residents, women more than men, and older more than younger persons. For example, in rural areas, 6% of those aged 50-59 report hospitalizations compared to 9% among those aged 70 or older. Among all women, 70% report visits to the doctor compared to 55% of all men. For preventive care, differences in use are quite evident by area of residence; for example, among persons aged 70 or older, 68% report using preventive care in rural areas, compared to 85% in urban areas. However, the age pattern differs for this type of service compared to the other two that were examined; individuals who are 50-59 tend to use more services than those who are 70 or older, for example.

Table II presents the distribution of self-reported health conditions and socioeconomic characteristics of the population by area of residence and gender. Starting with the socioeconomic conditions, the results show that the rural population is slightly older than the urban counterparts. In rural areas, 43% of those aged 50 or older report ages 50-59, compared to 50% in urban areas. With respect to marital status, one-quarter of the women are widowed, compared to 10% of the men, and these patterns seem similar between rural and urban areas; about 18% of the women are widowed in both rural and urban areas.

The estimates for educational achievement of the population confirms that the residents in urban areas are better educated than their rural counterparts; 42% of rural residents report zero years of formal education compared to 18% of urban residents; the education gap between men and women appears to be not as large as the one found between rural and urban areas. When we classify the population according to low-medium-high income, we find that a higher share of the rural population (43%) have low income compared to the urban residents (22%). Similarly, a higher proportion

* Health insurance coverage was coded as Yes if the person declared to have coverage from IMSS, ISSSTE, PEMEX, Defensa, Marina, or other public or private health insurance.

Table I

PROPORTION USING PREVENTIVE SERVICES, VISITS TO THE DOCTOR, AND HOSPITALIZATIONS BY AGE GROUP, GENDER, AND URBAN/RURAL RESIDENCE. POPULATION AGED 50 OR OLDER IN MEXICO

	Rural			*Urban*			*ALL*		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
Preventive care									
50-59	0.528	0.798	0.678	0.741	0.909	0.836	0.634	0.854	0.757
60-69	0.576	0.783	0.683	0.791	0.941	0.875	0.667	0.856	0.769
70- +	0.603	0.720	0.658	0.835	0.886	0.863	0.692	0.795	0.744
Total	0.564	0.775	0.675	0.776	0.914	0.853	0.659	0.842	0.758
Visited a doctor									
50-59	0.479	0.645	0.571	0.528	0.741	0.648	0.503	0.693	0.610
60-69	0.560	0.659	0.611	0.643	0.767	0.713	0.595	0.709	0.656
70- +	0.539	0.683	0.607	0.668	0.729	0.701	0.589	0.704	0.646
Total	0.522	0.658	0.593	0.592	0.746	0.678	0.553	0.700	0.632
Stayed at a hospital									
50-59	0.042	0.068	0.056	0.058	0.081	0.071	0.050	0.075	0.064
60-69	0.070	0.087	0.079	0.065	0.110	0.090	0.068	0.098	0.084
70- +	0.087	0.095	0.091	0.147	0.070	0.106	0.110	0.084	0.097
Total	0.064	0.080	0.072	0.079	0.087	0.084	0.071	0.083	0.078

Note: Use of health care services refers to: Preventive services (tetanus vaccination, tests for cholesterol, diabetes and high blood pressure for men and women; additionally having done an examination for breast lumps, a pap smear or a mammography for women, and having done a blood test for prostate cancer for men); Doctor visits refers to having visited the doctor at least once. Hospitalization refers to having spent at least one night at a hospital facility. Preventive care indicators refer to the last two years, while visits to the doctor and hospitalizations refer to the last 12 months.

Source: MHAS/ENASEM 2001

of women (36%) report low income compared to men (30%). The coverage of health insurance shows large contrasts as well. Almost three-quarters of the urban population (73%) have coverage compared to 38% of those in rural zones. Women show a slightly higher or similar coverage (56%) than men (52%).

The lower panel in table II shows the prevalence of self-reported functionality and chronic health conditions, again by area of residence, age and gender. With respect to self-reported limitations with activities of daily living or instrumental activities of daily living (ADL/IADL), the results show similar patterns between rural and urban residents (around 11%), but higher prevalence for women (13%) than men (8%). Self-reports of chronic health conditions show patterns of worse health among women than men. For example, 17% of women and 13% of men report diabetes. On the other hand, 18% of urban residents and 12% of rural report this condition. However, the report of cancer, stroke, heart and lung diseases are low compared to diabetes, and seem similar or slightly lower in rural than urban areas. With a few exceptions, both in rural and urban areas, and for men and women, the self-report of disability and chronic conditions is higher for older individuals than younger ones. The exceptions refer to persons aged 70 or older, who report lower prevalence of diabetes than their younger counterparts ages 50-69.

In summary, these results illustrate the differences found among individuals aged 50 or older in Mexico with respect to: utilization of health services, socioeconomic conditions, health care coverage, and self-reported health conditions. The question we address next is if the patterns of differential use reflect the differences found in socioeconomic conditions, health care needs, or both. In other words, can the variation in utilization be explained by the differences in education, self-reported health conditions, income, or health care coverage. Further, after controlling for socioeconomic conditions and health conditions, will major gaps remain in the use of health services according to health care coverage?

Table III presents the results of the multivariate regression analysis, showing the estimated marginal effects derived from the model. The marginal effect is interpreted for a dummy explanatory variable as the estimated change in the probability of utilization associated with those who report "yes" in the explanatory variable compared to those who report "no." For a categorical variable, the marginal effect is the estimated change in the probability of utilization of those in one category with respect to the reference (omitted) category of the same explanatory variable. For example, the estimated marginal effect of .07 for ADL/IADL in the hospitalization model implies that, holding all other variables at the mean value, the probability of hospi-

Table II

Socioeconomic characteristics, self-reported functionality and health conditions by gender and area of residence. Population aged 50 or older in Mexico

	Rural			Urban			All		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
A. Socioeconomic characteristics									
Age									
50-59	0.401	0.457	0.431	0.493	0.504	0.499	0.442	0.480	0.463
60-69	0.320	0.316	0.318	0.292	0.295	0.294	0.308	0.306	0.307
70- +	0.278	0.227	0.251	0.215	0.201	0.207	0.250	0.215	0.231
Marital status									
Married & cohabitation	0.782	0.632	0.703	0.829	0.516	0.654	0.803	0.576	0.680
Widow	0.109	0.241	0.178	0.082	0.269	0.186	0.097	0.254	0.182
Other	0.109	0.128	0.119	0.089	0.216	0.160	0.100	0.170	0.138
Education									
No education	0.369	0.461	0.417	0.150	0.198	0.177	0.271	0.335	0.305
1-5 years	0.426	0.371	0.397	0.272	0.308	0.292	0.357	0.341	0.348
6 years	0.113	0.104	0.108	0.229	0.205	0.216	0.165	0.153	0.158
7-+ years	0.093	0.063	0.077	0.348	0.288	0.315	0.207	0.171	0.188
Income group									
Low	0.400	0.463	0.433	0.169	0.255	0.217	0.297	0.363	0.332
Medium	0.328	0.302	0.315	0.369	0.343	0.354	0.347	0.322	0.333
High	0.270	0.226	0.247	0.457	0.402	0.426	0.354	0.311	0.331
Have health insurance	0.362	0.392	0.378	0.713	0.748	0.733	0.519	0.563	0.543
B. Functionality and health conditions									
ADL/IADL									
50-59	0.030	0.091	0.064	0.041	0.063	0.053	0.036	0.077	0.059
60-69	0.076	0.107	0.092	0.053	0.140	0.102	0.066	0.122	0.096
70- +	0.238	0.248	0.243	0.154	0.279	0.222	0.206	0.262	0.234
Total	0.103	0.132	0.118	0.069	0.129	0.102	0.088	0.131	0.111
Heart attack									
50-59	0.011	0.029	0.021	0.025	0.025	0.025	0.018	0.027	0.023
60-69	0.018	0.026	0.022	0.047	0.026	0.035	0.030	0.026	0.028
70- +	0.032	0.031	0.032	0.052	0.032	0.042	0.040	0.032	0.036
Total	0.019	0.028	0.024	0.037	0.027	0.031	0.027	0.028	0.027
Stroke									
50-59	0.005	0.020	0.013	0.017	0.023	0.020	0.011	0.021	0.017
60-69	0.030	0.021	0.025	0.020	0.022	0.021	0.026	0.022	0.023
70- +	0.060	0.013	0.038	0.019	0.026	0.023	0.044	0.019	0.031
Total	0.028	0.019	0.023	0.018	0.023	0.021	0.024	0.021	0.022
Cancer									
50-59	0.005	0.043	0.026	0.005	0.029	0.019	0.005	0.036	0.022
60-69	0.009	0.011	0.010	0.023	0.017	0.020	0.015	0.014	0.014
70- +	0.009	0.021	0.015	0.028	0.015	0.021	0.016	0.018	0.017
Total	0.007	0.028	0.018	0.015	0.023	0.020	0.011	0.026	0.019
Diabetes									
50-59	0.080	0.149	0.118	0.145	0.156	0.151	0.112	0.152	0.135
60-69	0.119	0.157	0.139	0.186	0.233	0.212	0.147	0.192	0.172
70- +	0.111	0.129	0.120	0.177	0.221	0.201	0.137	0.170	0.153
Total	0.101	0.147	0.125	0.164	0.192	0.179	0.129	0.168	0.150
Lung disease									
50-59	0.031	0.054	0.044	0.045	0.059	0.053	0.038	0.057	0.049
60-69	0.027	0.065	0.047	0.051	0.049	0.050	0.038	0.057	0.048
70- +	0.089	0.048	0.070	0.105	0.091	0.097	0.095	0.067	0.081
Total	0.046	0.056	0.051	0.060	0.063	0.061	0.052	0.059	0.056

Source: MHAS/ENASEM 2001

talization increases by 0.07 if the person reports having at least one ADL/IADL, compared to those who report no limitations.

The results show that holding constant all the other factors included in the model, individuals who self-reported health as "fair" or "poor" are more likely to use all three types of health care services than those who report "excellent/very good." On the other hand, those who report having at least one functionality problem (ADL/IADL) tend to use doctor visits or hospitalizations more compared to those who do not. However, functionality problems have no effect on the use of preventive services. Reporting a chronic condition (heart attack, stroke, cancer, lung disease, or diabetes) is associated with a higher likelihood of using all services. Nevertheless, the size of the effect of specific conditions varies by type of service. For example, the marginal effect of diabetes is .18 for the use of doctor visits, compared to other conditions such as heart attack (.13) and lung disease (.09) or stroke (.08). On the use of hospitalizations, the effect of heart condition is large (.14) compared to the effects of diabetes, lung disease, or stroke (ranging from .03 to .05).

Having controlled for health conditions, this study finds that age has a positive but small effect on the propensity to use any of the three types of health care services. Women are more likely to use preventive care than men; compared to married men, the propensity to use these services is 0.14 more likely for married women. Overall, women are also more likely to use doctor visits than men. However, only widowed women report higher likelihood of use of hospitalizations than married men. Holding all else constant, including health, there is higher utilization of doctor visits and preventive care among persons in the highest education and in the highest income group. However, higher education or income seems to have no association with differential use of hospitalizations. Availability of health insurance coverage varies positively with higher propensity to use all three types of services. On the other hand, urban residents are more likely to use preventive care than their rural counterparts, but there seems to be no differential use of doctor visits or hospitalizations.

In summary, the multivariate results imply that the gaps in utilization of health care services are indeed associated with differences in socioeconomic characteristics (enabling factors), health characteristics (need factors), relative costs, and preferences factors. Controlling for these factors, older age is slightly associated with higher propensity to use health care services of any of the three types that we examined; the effect of age on utilization of services seems to be indirect and operate across health care needs. Support is found for the hypotheses that socioeconomic attributes of the older adults would be associated differently with the use of services depending on the type of service. The results also confirm the apriori expectation that health insurance coverage would play a major role as a determinant of use of services even in the presence of health care needs and socioeconomic attributes of the population.

To illustrate visually the multivariate results obtained, figure 1 presents the estimated average probability of utilization of services for the three types of service. All other variables are held constant at a fixed value, and the probability of utilization is estimated for each type of service for men/women, residents of rural and urban areas, and among individuals with and without health insurance coverage. The other variables are held constant as follows: age 70 or older, with at least one limitation ADL/IADL, with diabetes, 1 to 5 years of education, low income, and married. The figure shows the gaps that continue to exist across the various groups of the population even after controlling for aspects of age, health conditions, education, income, and marital status. The greatest gap remains between those who have and do not have health insurance coverage in all types of service. In addition, only for the propensity to use preventive care and hospitalizations there are large gaps between men and women. The difference in use among residents of urban and rural areas remains but relatively small and only for preventive care. Thus, in particular for hospitalizations, the role of health insurance coverage stands out as a main source of differential use across the various groups of the population.

Conclusion

This paper focused on the propensity to use health care services among older adults in Mexico by examining the determinants of utilization of preventive care, doctor visits, and hospitalizations. This study finds that various health conditions increase the use of certain services more than others; that older age *per se* increases the use of health services only slightly; and that beyond socioeconomic attributes of the individuals and health conditions, the availability of health insurance plays an important role in enabling the use of services. This study also finds that the self-report of overall health has an effect on the use of health care services in the population of older adults, beyond the effect of having particular health conditions. This result may warrant further research as it is possible that in populations with low contact with the health system, low education, or low income, the knowledge of specific health conditions may create limitations in the ability to self-report them, thus the self-evaluation of overall health may be

Table III

Marginal effects from probit regression models for use of preventive care, doctor visits, and hospitalizations

	Preventive care	*Doctor visits*	*Hospitalization*
Self-reported health (ref. Exc.-Very good)			
Good	0.003	0.047*	0.011
	(0.849)	(0.012)	(0.401)
Fair	0.059‡	0.177‡	0.051‡
	(0.000)	(0.000)	(0.000)
Poor	0.094‡	0.212‡	0.109‡
	(0.000)	(0.000)	(0.000)
Disability and chronic conditions			
One or more ADL/IADL	0.012	0.056‡	0.070‡
	(0.312)	(0.000)	(0.000)
Heart disease	0.086‡	0.128‡	0.135‡
	(0.000)	(0.000)	(0.000)
Stroke	0.030	0.084‡	0.047‡
	(0.171)	(0.005)	(0.002)
Cancer	0.079‡	0.139‡	0.080‡
	(0.003)	(0.000)	(0.000)
Diabetes	0.125‡	0.184‡	0.029‡
	(0.000)	(0.000)	(0.000)
Lung disease	0.069‡	0.091‡	0.050‡
	(0.000)	(0.000)	(0.000)
Age (50-59)			
60 – 69	0.025‡	0.024*	0.008
	(0.002)	(0.021)	(0.174)
70 – older	0.019*	0.027*	0.014*
	(0.036)	(0.030)	(0.047)
Gender and marital status (ref. Married/Cohabitating Man)			
Married/Cohabitating Woman	0.138‡	0.129‡	0.008
	(0.000)	(0.000)	(0.201)
Widowed Woman	0.112‡	0.114‡	0.009
	(0.000)	(0.000)	(0.246)
Single, div, separated Woman	0.103‡	0.115‡	0.020*
	(0.000)	(0.000)	(0.038)
Widowed Man	-0.000	0.038§	0.007
	(0.984)	(0.090)	(0.576)
Single, div, separated Man	-0.003	-0.029	0.023
	(0.858)	(0.226)	(0.111)
Education (ref. No education)			
1-5 years	0.046‡	0.036‡	0.012§
	(0.000)	(0.002)	(0.071)
6 years	0.065‡	0.027§	-0.005
	(0.000)	(0.056)	(0.516)
7 or more years	0.111‡	0.078‡	0.001
	(0.000)	(0.000)	(0.863)
Income (ref. Low income)			
Medium	0.035‡	0.047‡	-0.001
	(0.000)	(0.000)	(0.865)
High	0.058‡	0.069‡	0.011§
	(0.000)	(0.000)	(0.089)
Has health insurance	0.134‡	0.161‡	0.040‡
	(0.000)	(0.000)	(0.000)
Urban residence (ref: rural)	0.038‡	-0.012	0.007
	(0.000)	(0.230)	(0.236)
Observed proportion	.802	.645	.095
Estimated probability	.846	.663	.079
No. of observations	12 446	12 446	12 446

* significant at 5%

‡ significant at 1%

§ significant at 10%

Note: *p* values in parentheses

Source: MHAS/ENASEM 2001

Figure 1a. Estimated propensity to use preventive services

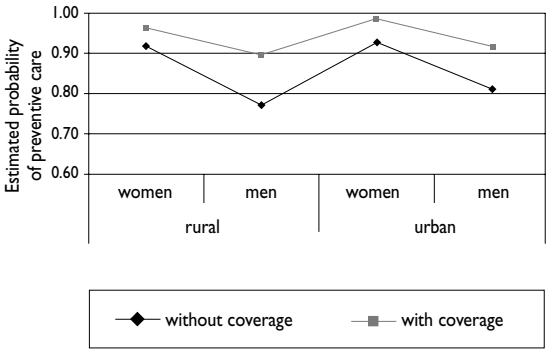


Figure 1b. Estimated propensity to use visits to the doctor

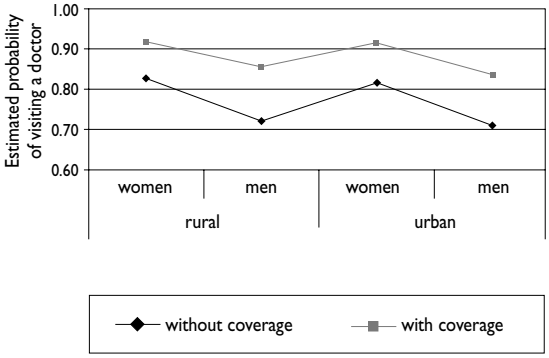
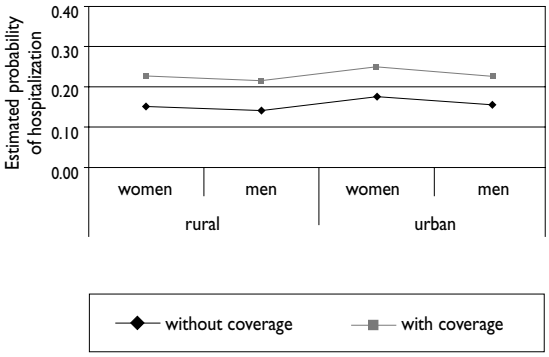


Figure 1c. Estimated propensity to use hospitalizations



Note: These figures report estimated probabilities computed from the models presented in Table III. Other attributes held constant as follows: person aged 70 or older, with at least one limitation ADL/IADL, with diabetes, 1-5 years of education, low income, married.

Source: MHAS/ENASEM 2001

FIGURE 1. ESTIMATED PROBABILITY OF UTILIZATION OF HEALTH CARE SERVICES BY GENDER, AREA OF RESIDENCE, AND HEALTH INSURANCE COVERAGE

a valuable indicator to assess health care demands of older adults.

There are various limitations worth mentioning, in particular the fact that cross-sectional data was used for the analyses. With panel data, it would be possible to observe changes in health care utilization as health transitions occur. We also need to consider that the extent of health insurance coverage may vary depending on the physical accessibility that the population has to health services; this may affect the results obtained. It is possible that when health insurance coverage and access to services reaches high levels among the population, the marginal gain obtained is higher than when coverage levels are low. It is likely also that some unobserved factors that are unaccounted for in the models may explain the results. For example, the relative gain in the quality of services enabled by the availability of health insurance may be greater in the urban areas than in rural Mexico. This could be the case because of the large role played by the private sector –at all levels of income– in the provision of care in Mexico. And this could also apply more to the case of doctor visits than to hospitalizations or preventive care.

Our understanding of health processes and health inequalities across the population shall increase as we continue to further our understanding of how the population tends to interact with and demand health care services. Older adults, in particular, may behave differently than the rest of the population regarding their health care seeking behavior because the perceived benefits of health care may vary as the expected remaining lifetime diminishes with age. It is thus important to continue our research to understand the particular demands of the older adults to be better prepared to meet the specific needs of this population and reduce the burden on the health system by the imminent aging of the Mexican population. It is possible, for example, to examine the determinants of the unmet demand for health care, since the MHAS/ENASEM surveys included questions on whether individuals faced situations in which health care was needed but not sought and the reasons for these situations. Future work by the authors of this paper shall continue research along these lines.

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