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Type of insurance and use of preventive health services among older adults in Mexico

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Abstract

Objectives—The main purpose of this paper was to assess the differences between *Seguro Popular* (SP) and employer-based health insurance in the use of preventive services, including screening tests for diabetes, cholesterol, hypertension, cervical cancer and prostate cancer among older adults at more than a decade of health care reform in Mexico.

Methods—Logistic regression models were used with data from the Mexican Health and Nutrition Survey 2012.

Results—After adjusting for other factors influencing preventive service utilization, SP enrollees were more likely to use screening tests for diabetes, cholesterol, hypertension and cervical cancer than the uninsured; however, those in employment-based and private insurances had higher odds of using preventive care for most of these services, except Pap smears.

Discussion—Despite all the evidence that suggests that *Seguro Popular* has increased access to health insurance for the poor, inequalities in healthcare access still exist in Mexico.

Keywords

Preventive services; Seguro Popular; healthcare access; healthcare inequality; social health insurance; Mexico

Research has shown that the use of health preventive services may help in reducing disease and disability of older adults and could save costs of treating chronic conditions (CDC, 2012; Maciosek, Coffield, Flottemesch, Edwards, & Solberg, 2010). Recommended preventive services for adults include blood pressure screening, cholesterol screening, colorectal cancer screening, diabetes screening, and obesity screening (<https://www.healthcare.gov/>). Effective monitoring and timely appropriate treatment can reduce morbidity and mortality (Duru, Vargas, Kermah, Pan, & Norris, 2007). Unfortunately, uninsured people face greater barrier to early diagnosis and treatment (Hafner-Eaton, 1993). Uninsured adults are more likely to delay and forego treatment (Baker, Shapiro, & Schur, 2000), which may leave hospitalizations as the only alternative (The Kaiser Family Foundation, 2012).

Although individual factors such as income, education, sex, and age may influence access to health preventive services and use medical care in general, preventive healthcare utilization is greatly impacted by health insurance access (Wallace, Gutiérrez, & Castañeda, 2008). Lack of insurance coverage impacts one's likelihood of seeking and receiving medical care in a timely manner (HealthyPeople2020, 2013). Inadequate access to healthcare can be a major burden for older people who may be at risk of chronic conditions; not preventing or addressing these issues can also lead to severe and costly medical complications. Placing a high priority on eliminating disparities, in 2001 the Mexican government implemented *Seguro Popular* [SP; People's Health Insurance] to provide insurance to improve health insurance coverage and access to preventive care to the uninsured population in Mexico. However, not many studies have evaluated the differences among the uninsured, *Seguro Popular* and private/employer-sponsored health insurance plans on the use of preventive services among older adults after there has been more than a decade of health care reform in Mexico. With these premises established, we explored the differences in the use of screening tests between the uninsured and SP affiliates and whether access to SP has made the use of preventive services similar to other insurance systems in Mexico.

Introduction

Mexico is an interesting population of study due to high prevalence of chronic conditions and the ongoing changes in the health care system. Since 2005 major causes of death include heart diseases, diabetes, and cancer (Instituto Nacional de Estadística y Geografía, 2011). Despite the efforts of the Mexican government to eliminate disparities in health, healthcare access and utilization, older adults are still largely uninsured and underserved. Just in 2010, among those who used medical care, approximately 22% of older adults aged 65 and over had to pay out-of-pocket (INEGI, 2010b), suggesting that inequalities are persistent for this group of the population (Pagán, Puig, & Soldo, 2007).

The healthcare system in Mexico is composed of social security systems, government providers and private insurance groups. Before the introduction of a major health reform in 2001, approximately fifty percent of the population did not have health insurance (Frenk, Sepúlveda, Gómez-Dantés, & Knaul, 2003). Those with insurance generally received care through the *Instituto Mexicano del Seguro Social* [IMSS, Mexican Social Security Institute] and the *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado* [ISSSTE, Institute of Social Security and Services for the State's Workers]. IMSS was created in 1943 to provide medical services to private sector employees (IMSS, 2014) and ISSSTE was then established in 1948 to provide coverage for government workers (ISSSTE, 2013). The military and the oil industry have their own security systems (ISSFAM and PEMEX). In 2000, approximately 78% of the population with insurance plans were IMSS enrollees, 14% were enrolled in ISSSTE, and 5% and 3% belonged to other public and private institutions, respectively (INEGI, 2013).

SP [People's Health Insurance] was introduced to provide access to health insurance to the population that was not covered under the insurance scheme developed for workers in the formal economy. SP was rolled out from 2002 to 2005. The majority of the states enrolled the first year (twenty of them), five were integrated in the second year and four were

introduced in 2004. In 2005, Chihuahua, Durango and Mexico City adopted the program, making SP available in every state in Mexico (<http://www.seguro-popular.salud.gob.mx/>). After the introduction of Mexico's social based health insurance, *Seguro Popular (SP)*, the number of uninsured population has significantly decreased. However, in 2010 the total number of people without insurance totaled about 38,020,372 (33%) (INEGI, 2010a).

Andersen's Behavioral Model

Anderson's behavioral model is one of the most useful conceptual frameworks in the public health and gerontology literature to help us understand why people use healthcare services and why inequalities in access to medical care exist (Bazargan, Bazargan, & Baker, 1998; Bowen & González, 2008; Gelberg, Andersen, & Leake, 2000; Miller, Kirk, Alston, & Glos, 2013). The initial model was developed in the 1960s and focused largely on individual factors and some aspects of the community; revisions to the framework have been made to include population-level factors (Andersen, 1995). According to Anderson's revised model, different factors impact access and utilization of healthcare services, which include *Predisposing*, *Enabling*, *Need* and *Health Behavior*. Predisposing factors include domains such as age, gender, marital status, and ethnicity. Enabling factors could be personal resources such as health insurance, income, education, or community resources such as area of residence. Finally, need relates to health conditions for healthcare service utilization.

According to Andersen and Newman (2005), equal access to care should be strongly predicted by the need to care (e.g., illness); however, inequality may exist when factors such as family resources, income and health insurance predict healthcare utilization. If such barriers exist, policies should address them and diminish or eliminate inequality. Therefore, Andersen's behavioral model was used to understand unequal access to health care in Mexico after a decade of the implementation of *SP*, which is insurance for the poor that seeks to provide universal healthcare coverage and eliminate disparities in access to care.

Data from the *Encuesta Nacional de Salud y Nutrición 2012* [ENSANUT, Mexican Health and Nutrition Survey] was used to assess how different types of health insurance impact the use of preventive services including screenings for high blood pressure, diabetes, cholesterol, cervical and colorectal cancer in middle-aged and older adults (as prior studies have recommended and examined before; Pagán et al., 2007), while controlling for individual and community characteristics. Based on the literature (Sosa-Rubi, Galarraga, & Harris, 2009) and goals of the Mexican government to eliminate health inequalities, it was hypothesized that *SP* enrollees would have better access to preventive services compared to the uninsured, but that no differences in utilization rates would be found between *SP* and *IMSS/ISSSTE* enrollees.

Methods

Data

Cross-sectional data from the 2012 ENSANUT survey was used to assess the effect of insurance on use of preventive services (<http://ensanut.insp.mx/>). This is a nationally representative data set that used a probabilistic multistage stratified cluster sampling design

and had participants from across Mexico. In 2012, ENSANUT had a sample of 46,277 adults (of those, a total of 15,707 adults were 50 years old and over). The questionnaire included information about respondent's sociodemographic conditions, health care utilization, anthropometry and household characteristics. More information about the design and data collection methods can be found elsewhere (Instituto Nacional de Salud Pública, 2012). The final sample for this study included respondents aged 50 and older who had no missing data on the variables used for the analysis. Of the 15,707 adults aged 50 and older, there were 11,464 cases with complete demographic data. Those with complete information were slightly older (M/SD 63.75 /10.34 vs. 64.01/10.78 years, $p<.0001$), female (56% vs. 52%, $p<.0001$), and have lower levels of education (only 23% had at least middle school or higher levels of education vs. 35%, $p<.0001$) than those with missing data. In addition, a higher proportion of people with complete values spoke indigenous language (12% vs. 8%, $p<.0001$). Finally, there were significant differences between cases with missing and without missing data and the area of residence ($p<.0001$). Approximately, 28% of people with missing data were from the west central region.

Variables

Dependent variables—Dependent variables included a total of five binary measures of preventive care coded to indicate the use of services in the last year. For all older adults aged 50 and older, three outcomes were considered to determine the impact of health insurance in the use of preventive health care including screening including: 1) hypertension; 2) cholesterol; and 3) diabetes. In addition, we also analyzed the use of preventive services for prostate cancer in men aged 50–69 and cervical cancer in women aged 50–69. Similar services and approach have been studied before to analyze preventive services utilization among Mexican older adults (Pagán et al., 2007).

Independent variables—The primary variable of interest was health insurance. Health insurance was coded into three different categories: 1) uninsured, 2) being insured by any employment-based program such as *IMSS*, *ISSSTE*, *PEMEX* or private health insurance and 3) being insured by *SP*.

Other independent variables were selected based on Anderson's model and previous similar studies (Chang, Lan, Ho, & Lan, 2010; Chaudhry, Fink, Gelberg, & Brook, 2003; Diedhiou, Probst, Hardin, Martin, & Xirasagar, 2010; Everett, Schumacher, Wright, & Smith, 2009; Salinas, Al Snih, Markides, Ray, & Angel, 2010; Stein, Andersen, & Gelberg, 2007).

Predisposing factors included age (measured in years), sex, indigenous background, marital status, (married vs. not married), smoking (current smoker vs. never smoked/former smoker) and drinking. Drinking was coded in four categories: 1) never drunk; 2) consuming 5 (men) or 4 (women) drinks on one occasion less than or once a year; 3) consuming 5 (men) or 4 (women) drinks on one occasion 2–11 times per year; 4) consuming 5 (men) or 4 (women) drinks on one occasion once a month or more often. *Enabling factors* were education (none, primary/secondary school, and at least high school), living alone, rural or urban residence, the general region of residency in the country (east central, west central, north and south/southeast) and socioeconomic status (SES). SES was the measure used and computed by the ENSANUT; the ENSANUT computed socioeconomic status and recoded

into tertiles (Gutiérrez, 2013). Finally, *need factors* were measured as the number of chronic conditions including, diabetes, hypertension, stroke or cardiovascular diseases (0, 1 or 2+).

Analysis

Descriptive analyses were used to compare health insurance status and individual and community characteristics. *Chi-square* tests were performed to examine categorical variables and *ANOVA* for continuous variables. Next, a series of logistic regression models were used to examine whether older adults used preventive services. The first logistic regression model examined the unadjusted association of health insurance. The second model adjusted for predisposing factors, Model 3 included enabling factors, and the last model included all the factors. This strategy has been used in prior studies (Chang et al., 2010; Salinas et al., 2010). Finally, we tested for the equality of coefficients between *SP* and *IMSS/ISSSTE* in all the models. All analyses were performed using Stata, version 13.1 (StataCorp LP, College Station, TX).

Results

There were 11,464 older adults aged 50 and older with complete demographic data. Overall, the majority of people in this sample was female (56%), married (63%), and had low levels of education, with approximately 77% having primary or no education. About 12% spoke indigenous language and 37% lived in rural areas (See Table 1). Although most people had health insurance (43% had insurance through *IMSS*, *ISSTE* or private and 41% were insured by *SP*), 16% of the population had no coverage. Descriptive statistics by insurance status are presented in Table 1. There were significant associations between health insurance status and predisposing, enabling and need factors. Approximately 50% of the uninsured adults were females compared to 56% and 59% of those insured through *SP* and *IMSS/ISSSTE*, respectively. A higher proportion of uninsured adults reported themselves as smokers (14%) and drink heavily (15%), consuming 5 (men) or 4 (women) drinks on one occasion once a month or more often. A higher proportion of people enrolled in *SP* were poor (58%) and had no education (30%) compared to *IMSS*-insured people, of whom approximately 16% were poor and 12% had no education. Yet, approximately 24% of people insured through *IMSS/ISSSTE* had at least two chronic conditions, compared to 19% of those with *SP* and 13% of uninsured persons (All significant differences have p-values of .0001).

Table 2 presents associations between use of preventive services and health insurance status among people in the sample. All the associations among the five preventive services were significant to *p-value* .01. Overall, lower proportions of people without insurance had screening tests compared to those insured by *SP* or *IMSS/ISSSTE*. However, compared to *SP*, higher frequencies of those with *IMSS/ISSSTE* have been screened for most preventive services, except for cervical cancer. Forty-six percent of those in *IMSS/ISSSTE* had been screened for diabetes compared 35% and 23% of those in *SP* and uninsured. Similarly, 46% of people with *IMSS/ISSSTE* had hypertension test compared to 39% of those with *SP* and 25% of the uninsured. The proportion of adults who have been tested for high cholesterol was also higher among people with *IMSS/ISSSTE* (48%) than those with *SP* (27%) or with no insurance (19%). *IMSS/ISSSTE*–insured men were more likely to be screened for

prostate cancer (24%) compared to *SP* (9%) or those uninsured (9%). Women with *SP* insurance had higher rates (48%) of screening for cervical cancer compared to 44% of women with *IMSS/ISSSTE* or 40% for uninsured women.

Results from logistic regression models for preventive services utilization are presented in Tables 3 and 4. In the unadjusted models, both *SP* and *IMSS/ISSSTE* enrollees were more likely to have been screened for diabetes (OR = 1.81, $p < .0001$ vs. OR = 2.97, $p < .0001$, respectively), cholesterol (OR = 1.54, $p < .0001$ vs. OR = 3.86, $p < .0001$, respectively) and hypertension (OR = 1.94, $p < .0001$ vs. OR = 2.59, $p < .0001$, respectively) compared to the uninsured. Adding covariates in the subsequent models decreased the odds ratios for each insurance type; however, insurance status remained a significant predictor even when predisposing factors, enabling factors, and need factors were included in Models 2, 3 and 4 for each of these preventive services. After adjusting for all factors, both *SP* and *IMSS/ISSSTE* enrollees were more likely to report the use of preventive services for: diabetes OR = 1.78, $p < .0001$ vs. OR = 2.41, $p < .0001$, respectively); cholesterol (OR = 1.64, $p < .0001$ vs. OR = 2.66, $p < .0001$, respectively); and hypertension (OR = 1.88, $p < .0001$ vs. OR = 2.19, $p < .0001$, respectively) screening than the uninsured. However, the test for the equality of the *SP* and *IMSS/ISSSTE* coefficients suggests that there are significant differences in the use of these preventive services between *SP* and *IMSS/ISSSTE* affiliates ($p = .05$ across all models).

Table 4 presents the logistic regression models for insurance type and cervical cancer screening among women aged 50–69. In Model 1d, women with *SP* were more likely to have a Pap smear (OR = 1.43, $p < .01$) and women with *IMSS/ISSSTE* were not significantly different from uninsured women. However, once enabling factors were added in Model 3d, both insurance types were significant, and this relationship remained significant in Model 4d, which adjusted for all three factor variables. After adjusting for predisposing, enabling and need factors the odds ratio was 1.34 (95% CI: 1.07–1.68) for *SP*, and 1.41 (95% CI: 1.12–1.78) for *IMSS/ISSSTE* for a Pap smear. Testing for equality of coefficients in the adjusted models showed no significant differences for Pap smear use across these two groups of women. For men aged 50–69 in *IMSS/ISSSTE*, the odds ratio for prostate cancer screening in the unadjusted Model 1e was 3.32 (95% CI: 2.47–4.47) and the adjusted odds ratio for prostate cancer screening in Model 4e was 2.02 (95% CI: 1.47–2.77). *SP* insurance was not significantly associated with prostate cancer screening in any of the models.

Discussion

At more than a decade of health care reform in Mexico, the main purpose of this paper was to assess the differences in the use of preventive services between persons enrolled in *SP* and the uninsured older populations. This research was also to determine whether *SP* had similar rates of the use of these services as compared to older adults enrolled in *IMSS/ISSSTE*. We hypothesized that individuals in *SP* would have better access than the uninsured, but that no difference would be found between *SP* and *IMSS/ISSSTE* enrollees. The findings partially supported these hypotheses. The results show a gap in utilization rates between *SP* affiliates and uninsured older adults. Access to *SP* showed a significant association for the use of preventive services including screening for diabetes, cholesterol

and hypertension for adults 50 years and over. In addition, *SP* enrollees had higher odds of reporting Pap smears for women aged 50–69 years old. Finally, health insurance status does not seem to have an association with the use of prostate cancer screening among men aged 50–69. However, there were differences between *SP* and *IMSS/ISSSTE*, with those in *IMSS/ISSSTE* having significantly higher odds of reporting utilization in most services, except for cervical cancer screening.

These results suggest that *SP* may be stepping in the right direction in closing the gap in insurance coverage for the poor and improving access to health insurance and access to medical services, at least preventive care utilization rates; this is also in accordance with data from the Mexican Census that show that close to 80% of the population had health insurance in 2013 (INEGI, 2013). Bivariate associations in the current study also showed that higher frequencies of older people in rural areas, indigenous, less educated and low-income were insured through *SP*. The positive effects of *SP* in different aspects of care have been documented by a few researchers. For example, Sosa-Rubi, Galarraga, and Lopez-Ridaura (2009) found that people with diabetes enrolled in *SP* have slightly better access to blood glucose tests, pharmacological treatment, and better glucose control compared to the uninsured. Also, Sosa-Rubi, Galarraga, and Harris (2009) show that *SP* has positive effects on the use of obstetrical services among poor women. Finally, Bleich, Cutler, Adams, Lozano, and Murray (2007) found that *SP* has increased the use of antihypertensive treatment and blood pressure control.

On the other hand, our results showed differences in utilization rates for most preventive services between *IMSS/ISSSTE* and *SP* affiliates. Current study results are consistent with those of Bautista-Arredondo, Serván-Mori, Colchero, Ramírez-Rodríguez and Sosa-Rubí (2014), who found disparities in use of outpatient services by insurance type in Mexico (Bautista-Arredondo, Serván-Mori, Colchero, Ramírez-Rodríguez & Sosa-Rubí, 2014). This suggests that inequalities in utilization of preventive services cannot be reduced solely by providing universal access to health insurance. There may be several explanations for these findings. Studies in other countries have discussed that other factors that prevent beneficiaries from seeking health services may be lack of knowledge about the healthcare system, lack of awareness of screening guidelines, lower self-perceived risk and differences in health behaviors (Vaidya, Partha, & Howe, 2011). For example, Damiani et al. (2012), found that despite having free cancer prevention programs for more than a decade in Italy, there is a small proportion of women that undertake screening tests; low perception in cancer screening efficacy, fear of radiation and anxiety about positive results may play a role in poor adherence to screening. Similar barriers were also documented in the study of Conde et al. (2011) about barriers to prostate cancer among Filipino men. Perhaps, male *SP* beneficiaries are dealing with similar issues and difficulties.

Disparities in utilization of medical services may be also due to insurance programs or plans that are structured to serve specific populations and features of the system where they provide health services (Bisgaier & Rhodes, 2011; Chang et al., 2014; Clark et al., 2014; Long, Coughlin, & King, 2005). In their qualitative study, Hernández-Ibarra and Mercado-Martínez, (2013) found that *SP* beneficiaries have prevented them from accessing services because of difficulty in scheduling appointments and lack of medical personnel and

facilities. In addition, *SP* enrollees may need to travel farther distances or may have transportation constraints. Distance to clinics and access to reliable transportation are predictors of routine screening (Kim, Chukwudozie, & Calhoun, 2013). Therefore, more research that explores underutilization and overutilization of preventive care is needed. In addition, interventions that target barriers to health care utilization and improve the quality of care for *SP* enrollees may improve screening rates among older Mexicans. Perhaps the Mexican government may need to increase media campaigns that target people with poor adherence and compliance, highlight information about the benefits of early diagnosis and the fact that these services are free of charge for *SP* beneficiaries.

This study has some limitations. First, we used cross-sectional data and did not address issues of causality. Future research should study longitudinal effects of *SP* among poor older adults on health and healthcare outcomes to determine if access to health insurance is increasing quality of care and decreasing health disparities among older adults. Second, ENSANUT participants' information about health and healthcare services utilization is self-reported. Third, a number of observations have missing values. Cases without complete data differed from those without missing values on some sociodemographic characteristics. Adults with complete data were more likely to be older, female, married, and indigenous and have lower levels of education. Those individuals who were included in the analysis may have different patterns of care, which may have biased the results. In addition, there may be other factors such as health status that were not available in the ENSANUT that were not included in the models that may affect health care utilization. Utilization of preventive care during the previous year for each service was reported by the participants and used as the dependent variables. There is a potential for some recall bias. Finally, there is some debate about guidelines of some preventive screenings such as prostate cancer (Wilt, Scardino, Carlsson, & Basch, 2014). Yet the benefits of having access to health insurance and benefits of early detection and treatment in reducing death dates have also been discussed (U.S. Preventive Services Task Force, 2012). Future studies should examine whether utilization rates of these services actually enhance health outcomes and decrease health expenditures for *SP* beneficiaries who use them.

Despite these limitations, this study has shown that compared to the uninsured, access to *SP* is associated with higher odds of utilization of preventive services for older adults in Mexico. However, inequalities in access to health insurance and differences in utilization rates of preventive services across insurance systems still exist after the full implementation of *SP*. The federal and state-level governments need to work together to improve access to care for vulnerable populations and to eliminate health and healthcare disparities, as well as the economic burden of chronic conditions.

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Table 1R
 Characteristics of older adults in ENSANUT age 50 and above by insurance status in Mexico

	Total (n=11,464)	Uninsured (n=1,788)	SP (n=4,738)	IMSS/ISSSTE (n=4,938)	P-value
Predisposing factors					
Age	63.76 (10.34)	63.61 (11.08)	63.19 (10.12)	63.19 (10.12)	<.0001
Female	6,446 (56.23)	888 (49.66)	2,662 (56.18)	2,896 (58.65)	<.0001
Indigenous	1,383 (12.06)	236 (13.20)	899 (18.97)	248 (5.02)	<.0001
Married	7,203 (62.83)	979 (54.75)	3,050 (64.37)	3,178 (64.28)	<.0001
Smoker	1,225 (10.69)	245 (13.70)	440 (9.29)	540 (10.94)	<.0001
Drinks alcohol					<.0001
Never drunk	3,271 (28.53)	528 (29.53)	1,499 (31.64)	1,244 (25.19)	
Binge 1	6,031 (52.61)	876 (48.99)	2,396 (50.57)	2,759 (55.87)	
Binge 2	747 (6.52)	116 (6.49)	289 (6.10)	342 (6.93)	
Binge 3	1,415 (12.34)	268 (14.99)	554 (11.69)	593 (12.01)	
Enabling factors					
Education					<.0001
None	2,528 (22.05)	494 (27.63)	1,423 (30.03)	611 (12.37)	
Primary/secondary school	6,279 (54.77)	936 (52.35)	2,804 (59.18)	2,539 (51.42)	
At least high school	2,657 (23.18)	358 (20.02)	511 (10.79)	1,788 (36.21)	
Socioeconomic status					
Low	4,365 (38.08)	838 (46.87)	2,738 (57.79)	789 (15.98)	<.0001
Medium	3,672 (32.03)	541 (30.26)	1,450 (30.60)	1,681 (34.04)	
High	3,427 (29.89)	409 (22.87)	550 (11.61)	2,468 (49.98)	
Living alone	2,005 (17.49)	412 (23.04)	836 (17.64)	757 (15.33)	<.0001
Rural residence	4,276 (37.30)	685 (38.31)	2,645 (55.83)	946 (19.16)	<.0001
Region of residency					
East central	2,484 (21.67)	448 (25.06)	1,018 (21.49)	1,018 (20.62)	<.0001
West central	3,253 (28.38)	448 (25.06)	1,452 (30.65)	1,353 (27.40)	
North	2,531 (22.08)	351 (19.63)	662 (13.97)	1,518 (30.74)	
South/southeast	3,196 (27.88)	541 (30.26)	1,606 (33.90)	1,049 (21.24)	
Need factors					

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	Total (n=11,464)	Uninsured (n=1,788)	SP (n=4,738)	IMSS/ISSSTE (n=4,938)	P-value
Chronic conditions					<.0001
0	5,539 (48.32)	1044 (58.39)	2,411 (50.89)	2,084 (42.20)	
1	3,616 (31.64)	503 (28.13)	1,445 (30.50)	1,668 (33.78)	
2+	2,309 (20.14)	241 (13.48)	882 (18.62)	1,186 (24.02)	

Note:

Binge1 = defined as consuming 5 (men) or 4 (women) drinks on one occasion less than or once a year

Binge2 = defined as consuming 5 (men) or 4 (women) drinks on one occasion 2–11 times per year

Binge3= defined as consuming 5 (men) or 4 (women) drinks on one occasion once a month or more often

Table 2R
Use of preventive services in the past year for Mexican older adults (≥ 50) in ENSANUT by insurance status

	Total	Uninsured	SP	IMSS/ISSSTE	P-value
<i>Screening test for</i>					
Diabetes	(n=9,020) 37.39%	(n=1,517) 22.61%	(n=3,828) 34.56%	(n=3,675) 46.45%	<.0001
Cholesterol	(n=11,405) 34.92%	(n=1,779) 19.39%	(n=4,705) 26.99%	(n=4,921) 48.12%	<.0001
Hypertension	(n=7,661) 39.15%	(n=1,349) 24.68%	(n=3,291) 38.89%	(n=3,021) 45.88%	<.0001
Cervical cancer	(n=3,792) 45.23%	(n=431) 39.44%	(n=1,620) 48.15%	(n=1,741) 43.94%	.0019
Prostate cancer	(n=3,518) 14.92%	(n=663) 8.75%	(n=1,509) 9.41%	(n=1,346) 24.15%	<.0001

Note:
Cervical and prostate cancer statistics were calculated for people age 50–69

Logistic Regression results for health insurance on the use of preventive services: Diabetes, cholesterol and hypertension screening among older adults age50 and above

Table 3R

VARIABLES	Diabetes				Cholesterol				Hypertension			
	Model1a	Model2a	Model3a	Model4a	Model1b	Model2b	Model3b	Model4b	Model1c	Model2c	Model3c	Model4c
Insurance												
SP	1.808*** (1.575– 2.074)	1.789*** (1.557– 2.056)	1.819*** (1.580– 2.096)	1.781*** (1.545– 2.053)	1.537*** (1.344– 1.757)	1.541*** (1.346– 1.764)	1.732*** (1.508– 1.989)	1.642*** (1.427– 1.890)	1.942*** (1.685– 2.239)	1.908*** (1.652– 2.204)	1.907*** (1.648– 2.207)	1.883*** (1.626– 2.180)
IMSS/ISSSTE	2.969*** (2.590– 3.404)	2.719*** (2.367– 3.123)	2.497*** (2.163– 2.884)	2.414*** (2.088– 2.790)	3.855*** (3.385– 4.391)	3.577*** (3.135– 4.081)	2.881*** (2.514– 3.301)	2.654*** (2.312– 3.048)	2.586*** (2.242– 2.984)	2.362*** (2.043– 2.731)	2.256*** (1.939– 2.625)	2.186*** (1.877– 2.546)
Predisposing factors												
Age		1.004 (1.000– 1.008)	1.008** (1.003– 1.012)	1.005* (1.000– 1.010)		0.995* (0.991– 0.999)	1.002 (0.998– 1.007)	0.998 (0.993– 1.002)		1.004 (1.000– 1.009)	1.006* (1.001– 1.012)	1.006* (1.001– 1.011)
Female		1.549*** (1.392– 1.725)	1.582*** (1.419– 1.764)	1.500*** (1.343– 1.674)		1.362*** (1.235– 1.503)	1.394*** (1.261– 1.541)	1.276*** (1.152– 1.414)		1.613*** (1.438– 1.809)	1.638*** (1.458– 1.841)	1.621*** (1.442– 1.822)
Indigenous		0.714*** (0.619– 0.824)	0.834* (0.714– 0.974)	0.876 (0.749– 1.024)		0.583*** (0.506– 0.671)	0.682*** (0.585– 0.794)	0.714*** (0.611– 0.834)		0.825** (0.715– 0.950)	0.870 (0.745– 1.014)	0.875 (0.749– 1.021)
Married		1.074 (0.974– 1.183)	1.077 (0.963– 1.205)	1.083 (0.967– 1.212)		1.050 (0.960– 1.148)	1.125* (1.014– 1.247)	1.122* (1.010– 1.247)		1.199*** (1.079– 1.333)	1.200** (1.062– 1.356)	1.196** (1.058– 1.353)
Smokes		0.845* (0.728– 0.981)	0.815** (0.701– 0.948)	0.849* (0.729– 0.988)		0.783*** (0.683– 0.899)	0.753*** (0.654– 0.866)	0.794** (0.689– 0.916)		0.895 (0.770– 1.039)	0.881 (0.757– 1.025)	0.888 (0.763– 1.034)
Binge1		1.277*** (1.144– 1.426)	1.266*** (1.132– 1.415)	1.238*** (1.107– 1.386)		1.435*** (1.297– 1.588)	1.375*** (1.241– 1.524)	1.344*** (1.210– 1.492)		1.534*** (1.358– 1.732)	1.519*** (1.344– 1.718)	1.508*** (1.333– 1.706)
Binge2		1.571*** (1.286– 1.920)	1.589*** (1.299– 1.944)	1.554*** (1.269– 1.904)		1.593*** (1.325– 1.915)	1.546*** (1.283– 1.863)	1.527*** (1.263– 1.846)		1.722*** (1.394– 2.128)	1.726*** (1.395– 2.136)	1.701*** (1.373– 2.107)
Binge3		1.269** (1.067– 1.510)	1.289** (1.082– 1.535)	1.254* (1.052– 1.496)		1.361*** (1.158– 1.599)	1.316*** (1.118– 1.549)	1.297** (1.099– 1.531)		1.480*** (1.234– 1.777)	1.495*** (1.245– 1.796)	1.470*** (1.223– 1.768)

VARIABLES	Diabetes			Cholesterol			Hypertension					
	Model1a	Model2a	Model3a	Model4a	Model1b	Model2b	Model3b	Model4b	Model1c	Model2c	Model3c	Model4c
Enabling factors												
Primary/secondary school		1.089 (0.966–1.228)		1.088 (0.964–1.228)		1.283*** (1.143–1.440)		1.279*** (1.137–1.438)		0.986 (0.867–1.120)		0.992 (0.873–1.128)
At least high school		1.317*** (1.123–1.545)		1.357*** (1.156–1.592)		1.580*** (1.363–1.831)		1.693*** (1.457–1.968)		1.184 (0.999–1.403)		1.223* (1.031–1.452)
Medium SES		1.119 (0.995–1.259)		1.098 (0.975–1.236)		1.370*** (1.229–1.527)		1.325*** (1.186–1.480)		1.026 (0.905–1.162)		1.015 (0.896–1.151)
Higher SES		1.163* (1.011–1.337)		1.137 (0.988–1.309)		1.617*** (1.424–1.836)		1.598*** (1.406–1.820)		1.142 (0.982–1.328)		1.140 (0.980–1.327)
Live alone		1.043 (0.910–1.196)		1.031 (0.899–1.183)		1.218** (1.073–1.382)		1.219** (1.071–1.387)		1.036 (0.891–1.206)		1.028 (0.883–1.197)
Rural residence		1.057 (0.952–1.173)		1.046 (0.942–1.162)		0.815*** (0.739–0.898)		0.828*** (0.750–0.914)		1.099 (0.984–1.228)		1.115 (0.998–1.246)
West central		1.363*** (1.202–1.545)		1.353*** (1.193–1.536)		1.269*** (1.128–1.427)		1.269*** (1.125–1.430)		1.359*** (1.187–1.555)		1.356*** (1.184–1.553)
North		1.156* (1.009–1.324)		1.139 (0.993–1.305)		1.375** (1.216–1.556)		1.347*** (1.188–1.527)		1.016 (0.876–1.179)		1.022 (0.880–1.186)
South		1.008 (0.883–1.151)		0.998 (0.874–1.141)		1.396*** (1.233–1.581)		1.403*** (1.236–1.592)		1.099 (0.956–1.264)		1.087 (0.945–1.251)
Need factors												
Chronic conditions												
1				1.585*** (1.435–1.749)				1.954*** (1.777–2.150)				1.478*** (1.323–1.651)
2+				1.704*** (1.467–1.979)				2.776*** (2.491–3.095)				1.684*** (1.348–2.102)

VARIABLES	Diabetes				Cholesterol				Hypertension			
	Model1a	Model2a	Model3a	Model4a	Model1b	Model2b	Model3b	Model4b	Model1c	Model2c	Model3c	Model4c
<i>SP=IMSS</i>	109.44***	73.08***	30.87***	0.09***	447.02***	355.44***	98.27***	84.40***	31.44***	16.31***	7.41**	5.81*
<i>Chi2</i>												
Observations			(n=9,020)				(n=11,405)				(n=7,661)	

Notes: Table presents odd ratios, with 95% confidence intervals in parentheses

*** p<0.001

** p<0.01

* p<0.05

Binge1 = defined as consuming 5 (men) or 4 (women) drinks on one occasion less than or once a year

Binge2 = defined as consuming 5 (men) or 4 (women) drinks on one occasion 2–11 times per year

Binge3= defined as consuming 5 (men) or 4 (women) drinks on one occasion once a month or more often

Source: ENSANUT 2012

Logistic Regression results for health insurance on the use of preventive services: Cervical cancer and prostate cancer screening among older adults age 50 to 69

VARIABLES	Cervical cancer				Prostate cancer			
	Model1d	Model2d	Model3d	Model4d	Model1e	Model2e	Model3e	Model4e
Insurance								
SP	1.426** (1.148–1.770)	1.387** (1.114–1.727)	1.349** (1.079–1.688)	1.343* (1.073–1.680)	1.084 (0.787–1.492)	1.032 (0.746–1.429)	1.267 (0.906–1.770)	1.223 (0.874–1.710)
IMSS/ISSTSE	1.203 (0.970–1.492)	1.231 (0.990–1.531)	1.426** (1.136–1.791)	1.414** (1.125–1.777)	3.320*** (2.467–4.468)	2.885*** (2.131–3.907)	2.152*** (1.572–2.946)	2.021*** (1.473–2.773)
Predisposing factors								
Age		0.967*** (0.955–0.978)	0.966*** (0.954–0.978)	0.965*** (0.953–0.978)		1.050*** (1.033–1.068)	1.073*** (1.054–1.093)	1.070*** (1.051–1.090)
Indigenous		1.259* (1.015–1.560)	0.910 (0.721–1.149)	0.914 (0.724–1.154)		0.473*** (0.318–0.706)	0.538** (0.353–0.818)	0.548** (0.360–0.834)
Married		1.289*** (1.124–1.478)	1.233** (1.058–1.436)	1.234** (1.059–1.437)		1.149 (0.885–1.492)	1.070 (0.771–1.485)	1.062 (0.764–1.476)
Smokes		0.769 (0.572–1.033)	0.880 (0.652–1.188)	0.881 (0.652–1.189)		0.887 (0.696–1.132)	0.872 (0.680–1.119)	0.900 (0.701–1.155)
Binge1		0.967 (0.842–1.110)	0.990 (0.859–1.142)	0.986 (0.855–1.138)		1.301 (0.825–2.051)	1.342 (0.847–2.127)	1.306 (0.823–2.073)
Binge2		1.127	1.080	1.081		1.346	1.428	1.386
Binge3		1.038 (0.694–1.553)	0.968 (0.643–1.459)	0.962 (0.638–1.449)		1.128 (0.700–1.817)	1.170 (0.722–1.895)	1.152 (0.710–1.868)
Enabling factors								
Primary/secondary school			0.932 (0.771–1.128)	0.932 (0.770–1.127)			1.447 (0.990–2.115)	1.458 (0.997–2.133)
At least high school			0.901 (0.708–1.147)	0.907 (0.712–1.155)			2.723*** (1.795–4.132)	2.769*** (1.822–4.207)
Medium SES			0.843 (0.707–1.006)	0.842 (0.705–1.004)			1.000 (0.749–1.334)	0.993 (0.744–1.325)
Higher SES			0.810* (0.657–0.999)	0.812 (0.659–1.001)			1.617** (1.184–2.208)	1.602** (1.173–2.187)
Live alone			0.817 (0.658–1.015)	0.818 (0.659–1.015)			0.973 (0.663–1.429)	0.960 (0.652–1.413)

VARIABLES	Cervical cancer				Prostate cancer			
	Model1d	Model2d	Model3d	Model4d	Model1e	Model2e	Model3e	Model4e
Rural residence			1.086 (0.928– 1.271)	1.089 (0.930– 1.274)			0.962 (0.751– 1.233)	0.977 (0.763– 1.253)
West central			0.802* (0.666– 0.966)	0.801* (0.665– 0.965)			1.204 (0.901– 1.610)	1.195 (0.893– 1.599)
North			0.752** (0.615– 0.919)	0.750** (0.613– 0.916)			1.325 (0.983– 1.785)	1.297 (0.961– 1.749)
South			1.378*** (1.141– 1.665)	1.375*** (1.139– 1.662)			1.305 (0.955– 1.783)	1.291 (0.944– 1.767)
Need factors								
Chronic conditions								
1				1.039 (0.894– 1.208)				1.376** (1.101– 1.719)
2+				1.094 (0.920– 1.302)				1.620*** (1.242– 2.114)
SP=IMSS	5.98*	2.73	0.42	0.37	106.00***	85.99***	16.60***	14.84***
Observations			(n=3,792)				(n= 3,518)	

Notes: Table presents odd ratios with confidence intervals in parentheses.

*** p<0.001

** p<0.01

* p<0.05

Binge1 = defined as consuming 5 (men) or 4 (women) drinks on one occasion less than or once a year
 Binge2 = defined as consuming 5 (men) or 4 (women) drinks on one occasion 2–11 times per year
 Binge3= defined as consuming 5 (men) or 4 (women) drinks on one occasion once a month or more often
 Source: ENSANUT 2012