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The Rural – Urban Divide: Health Services Utilization Among Older Mexicans in Mexico

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Abstract

Context—Mexico

Purpose—Using the health care service utilization model as a framework, this paper will analyze the differences in health care service use among older Mexicans living in urban and rural areas in Mexico.

Methods—The Mexican Health and Aging Survey (MHAS) data were used to test the applicability of Andersen's "model of health services" of predisposing (ie, age, sex, etc.), enabling (education, insurance coverage, etc.) and need factors (diabetes, hypertension, etc.) to predict ever being in the hospital and physician visits in the past year by place of residence (urban, rural, semi-rural).

Findings—Results showed that older Mexicans living in the most rural areas (populations of 2500 or fewer) were significantly less likely to have been hospitalized in the previous year and visited the physician less often ($P < .0001$) than their urban counterparts. The significant difference in hospitalization between rural and urban residing older Mexicans was largely accounted for by having health care coverage. Certain need factors such as diabetes, previous heart attack, hypertension, depression, and functional limitations predicted frequency of physician visits and hospitalization, but they did not explain variations between rural and urban older Mexicans.

Conclusions—Not having insurance coverage was associated with a lower likelihood of spending an overnight visit in the hospital and visiting a physician for older Mexicans. This lower utilization may be due to barriers to access rather than better health.

Keywords

hospitalization; insurance; Mexico; rural; urban

The epidemiological transition has progressed through much of Mexico and, as a result, the population in Mexico is aging quickly.1 Mexico has now reached the juncture where health and quality of life in older age are a public health focus, yet little effort has been made to

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address the specific needs of this population.2,3 Most government programs to improve health are geared toward the poor in general, only benefiting poor older Mexicans. For example, one of the biggest efforts to improve the health of poor Mexicans, health care reform—a universal program in its infancy stage—primarily benefits infants and children.4

In addition to health care reform, municipalities and the federal government have set up social programs to alleviate the negative effects of poverty on nutrition for the poor and elderly. For instance, in Mexico City, a public health program for the elderly was established to provide a small pension and staple food allocation for those aged 65 years and older.5 Food banks are also becoming more pervasive, providing poor Mexicans free or low-cost food.6 Despite these efforts, much of the older Mexican population continues to live without any reliable source of health care or social resources when they become ill.2 In addition, no attempt has been made to narrow the disparities between rural and urban older Mexicans in health care access.

In 2006, Mexico had a population of approximately 107 million people, mostly urban (75.7%).7 However, while younger individuals move to urban areas for employment; the elderly tend to remain in their traditional locations. Data from the 2000 census shows that nearly 40% (38.1%) of Mexicans aged 65 and over live in towns with populations of 14 999 people or fewer, a greater proportion than any other age group.8 Given the elevated levels of poverty and lack of services in smaller towns and villages, older Mexicans are at greater risk for experiencing the negative health consequences associated with material disadvantage.

Health Care Access in Mexico

In Mexico, the health care system is work-based.9 Mexicans in the formal labor market access health care programs associated with the sector in which they are employed. For example, Mexicans in private industry are eligible for benefits through the Instituto Mexicano del Seguro Social (IMSS), which offers health insurance, health services, and pension benefits for little to no out-of-pocket expense. Two other work-based health insurance options are Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estados (ISSSTE) for state workers and PEMEX, a self-insured health insurance program run by the government-owned petroleum company, Petróleos Mexicanos. Mexicans who have the economic means to pay out of pocket can pay private health providers for their care. However, since nearly 50% of the work force in Mexico is employed in the informal market or worked in the US, many older Mexicans are uninsured and pay out of pocket for much of their health care.9–11 The Mexican government does provide free state-run health services for anyone uninsured or unable to pay. However, resources are limited, forcing many to go without.

Although it is estimated that over 50% of the Mexican population is uninsured, these numbers vary from state to state.12 In the northern states of Coahuila and Chihuahua the proportion of uninsured is approximately 45%, yet the poorest and most rural states of Chiapas, Guerrero, and Oaxaca show 80% of the population without formal health care coverage. Although the Secretary of Health runs a public health care system for the uninsured, this system does not have the resources to adequately manage the health needs of this population. Moreover, since rural older Mexicans are less likely to be covered by work-based health care programs, this population incurs much greater out-of-pocket expenses than their urban counterparts.13,14 Paying out of pocket for health care forces older rural Mexicans to choose between receiving necessary health care and paying for food or electricity.15,16

Health care services in rural areas are often very basic, lacking adequately equipped hospitals or health clinics.17 In the United States, access to health care in the rural setting

often alleviates overuse of emergency rooms for non-emergent health needs, and distance from the hospital may determine whether a patient survives a heart attack.18 In Mexico, rural residence is a risk factor for cervical cancer mortality.19 Lack of access to quality care is often cited as the primary modifiable risk factor for mortality disparities in rural Mexico. 20 In other developing countries, longevity is associated with health care access not only in older age, but over the entire life course,21 suggesting that long-term access to reliable health services may contribute to health disparities between rural and urban populations worldwide.

Study Framework

In this study, we use Andersen's "Behavioral Model of Health Services Use" as a framework to demonstrate the disparity in health care utilization between rural and urban older Mexicans living in Mexico.22 Andersen initially developed the model in the late 1960s, grouping contributing factors into predisposing, enabling, and need as a way of illustrating patterns of health care utilization by families. Over the years, Andersen has revised the model to account for the growing complexities associated with medical care, shifting focus to the individual.

Andersen's model has been used in a number of studies to characterize health care utilization in Hispanic populations.23–25 Al Snih et al determined that need factors had the most predictive power in determining doctor visits and overnight hospitalization in older Mexican Americans, yet, in Mexico, Tamez-González et al found that enabling factors, particularly education, proved to be the most important in predicting prenatal care utilization.23–26 In the current study, we use Andersen's model to better understand and help explain health care access disparities between rural and urban older Mexicans. Since disparities exist in health care coverage between rural and urban states in Mexico, analysis for this study will focus on understanding the extent to which formal health care coverage can explain variations in overnight hospital stays and physician visits between rural and urban older Mexicans. In addition, we will attempt to disentangle differences in the relationship between health care coverage, health conditions and health care utilization in older Mexicans living in varying population sizes.

METHODS

Data

The Mexican Health and Aging Survey (MHAS) is a nationally representative panel survey of Mexicans aged 50 or older in the year 2000 and their spouses (N = 15 186).27 Participants were identified in conjunction with the 2000 National Employment Survey / Encuesta Nacional de Empleo (ENE). Cases with proxy respondent and subjects with missing values in outcome and explanatory variables were dropped. Finally, we did not include subjects' spouses, leaving a total of 7880 cases for analysis.

Variable Measurement

Our dependent variable was whether respondents ever spent at least 1 overnight stay in the hospital in the past year (yes = 1) and the number of times subjects had seen a physician in the previous year. Rural or urban residence was determined by the locality size, and criteria were set based on standards adopted by the Mexican census bureau, the Instituto Nacional de Estadística y Geografía (INEGI), for the 2000 National Employment Survey/ Encuesta Nacional de Empleo (ENE). [28] The INEGI considers a population of 2499 or fewer as non-urban; we counted these subjects as rural. In addition, ENE further categorized locality size as 100 000 or more people, 15 000 to 99 999 people, and 2500 to 14 999 people (semi-rural). These categories were counted as urban, semi-urban, and semi-rural.

Factors were selected based on Andersen's model and a previous similar study of Mexican Americans.28 The predisposing factors selected were age (continuous), sex, marital status, and migration history to the United States (non-migrant, less than 15 years in the United States, 15 years or more in the United States). Enabling factors were years of formal education (continuous), self-assessed economic situation, and number of living children (continuous) at baseline. Self-assessed economic situation was chosen in lieu of income because it is a more robust measure of SES than income or occupation.29 In Mexico, economic resources are pooled between family members as well as between spouses. Furthermore, for older Mexicans without pensions, pooled resources from other household members may improve their overall economic situation to relatively good. The 3-part coding scheme was as follows: excellent/very good/good, fair, and poor.

Health plan coverage was assessed by whether subjects reported having health care coverage through any work-based program (ie, IMSS, ISSSTE or PEMEX) or private health care. Subjects responding "no" were considered to not have health plan coverage (not covered = 1, covered = 0). Finally, need factors were measured as self-reported medical conditions (arthritis, diabetes, heart attack, hypertension, stroke, bone fracture, and cancer), depressive symptoms as measured by the Center for Epidemiological Studies Depression Scale (CES-D; 0 – 9 scale),30 and whether participants had any functional limitations (Activities of Daily Living, ADL) that required assistance (yes/no).

Analysis

Weighted frequencies were obtained for all predisposing, enabling, and need factors for the total sample and by locality size. Descriptive statistics were used to test for differences in independent and dependent variables by size of locality. Logistic regression was used to predict any overnight stay in the hospital in the previous year. To predict physician visits, Ordinary Least Square (OLS) regression analysis was used. Six Models for whether subjects stayed at least 1 night in the hospital the previous year and for number of physician visits in the previous year were specified using the forward selection method.31 In the first Model, the unadjusted effects of locality size were estimated. The second Model adjusted for predisposing factors, the third for enabling factors except for insurance coverage, Model 4 included insurance coverage, and Model 5 added need factors without insurance coverage. Model 6 included all predisposing, enabling, and need factors. All regression models used sample weights provided by the principal investigators of the MHAS study. All analysis was performed using STATA (Statacorp LP, College Station, Texas).

FINDINGS

Table 1 presents the descriptive statistics, including average outpatient physician visits and percent hospitalized, for each locality size. On average, urban dwellers visited a physician once more per year than their rural counterparts (5.68 versus 4.89). The prevalence of having been hospitalized was 10.7% in urban subjects but only 7.8% in rural residents. With respect to predisposing factors, subjects living in rural and semi-rural localities tended to be older ($F = 14.37$, $P < .0001$), were less likely to be female ($\chi^2 = 42.3$, $P < .0001$), and were most likely to have migrated ($\chi^2 = 22.5$, $P < .0001$).

With respect to enabling factors, older Mexicans living in rural localities were the least educated, whereas urban subjects were the most educated ($F = 273.72$, $P < .0001$). Subjects living in rural localities were most likely to be without health insurance coverage (75.9%) compared to their urban counterparts (26.3%) ($\chi^2 = 956.0$, $P < .0001$). Rural residents were also most likely to rate their economic condition as poor (27.6%) ($\chi^2 = 204.0$, $P < .0001$). In terms of need factors, the most prominent difference between urban and rural dwellers was incidence of diabetes. In urban localities the prevalence of diabetes was 18.7%. As the size

of locality decreased, prevalence of diabetes gradually declined, so that prevalence in rural localities was 7.2% ($\chi^2 = 42.3$, $P < .0001$). Urban subjects also had a higher prevalence of hypertension (39.1% versus 29.2%, $\chi^2 = 22.8$, $P = .0001$) and cancer (2.2% versus 1.7%, $\chi^2 = 87$, $P = .034$) than rural subjects.

Table 2 presents the OLS regression results for physician visits. In the unadjusted model (Model 1), subjects living in semi-rural ($\beta = -.694$, $P < .05$) and rural ($\beta = -1.03$, $P < .001$) localities visited the physician, on average, significantly less frequently than their urban counterparts. After controlling for predisposing factors (Model 2), these effects remained significant and changed little from the previous model (semi-rural $\beta = -.715$, $P < .05$ and rural $\beta = -1.03$, $P < .001$). In Model 3, enabling factors except for health plan coverage were added. Coefficients for locality size are increased, so that when taking into consideration the socioeconomic status of subjects, the disparities between urban subjects and those living in less populated areas of Mexico was greater. The frequency of physician visits for semi-urban subjects was near significant, so that on average these subjects visit physicians .600 ($P < .10$) fewer times per year than their urban counterparts. In addition, semi-rural subjects visited the physician .813 ($P < .05$) fewer times per year and rural subjects made 1.14 ($P < .001$) fewer visits than their urban counterparts. In Model 4, which included whether subjects had health care coverage, the effect of locality size ceased to be significant. In Model 5, need factors were included in the model without health plan coverage to determine the extent to which need factors explained locality size differences before adjusting for health plan coverage. Need factors did indeed explain the effects for semi-urban and semi-rural residence, but the coefficient remained significant for rural residence ($\beta = -.515$, $P < .05$). Model 6, which included all factors, confirmed the insignificance of locality size in determining whether older Mexicans saw a doctor during the previous year ($P < .0001$).

Interaction models were constructed between locality size and health care coverage with need factors (not shown). Interaction effects between locality size and health care coverage were not significant, yet significant effects were found between certain need factors and locality size. First, semi-rural subjects with diabetes visited a physician, on average, 5.1 times more than their urban counterparts without diabetes. Similarly, subjects reporting any ADL limitations who lived in rural Mexico visited a physician on average 4.08 ($P < .05$) times more than their urban counterparts without any ADL limitation.

Table 3 presents the odds ratio for any overnight stay in the hospital in the year before the survey. In Model 1, older Mexicans living in rural localities were significantly less likely to have been hospitalized in the previous year (OR = .707, $P < .05$) than those living in other settings. Older Mexicans living in more rural localities were not significantly different from their urban counterparts in age, number, co-morbidities, or economic status. In Model 2, predisposing factors decreased the odds ratios for all localities, but the effects were minimal and rural locality remained the only significant factor (OR = .649, $P < .01$). Including enabling factors in Model 3 had limited effect on the relationship between locality size and overnight hospital stay, and rural residence remained the only significant factor. In Model 4, adding health care coverage reduced the odds ratios for each locality observed in Models 2 and 3, making it insignificant (OR = .746, $P > .10$). Therefore, not having a health care plan explained the differences between locality sizes in subjects' likelihood of having been hospitalized in the previous year.

To explore the possibility that older Mexicans might be more inclined to be hospitalized due to exacerbation of health conditions as a result of poor access to outpatient services, need factors were added both to the model without a health care coverage variable (Model 5) and to the model with a health care coverage variable (Model 6). In Model 5, the association

between locality size and hospitalization was reduced, but rural locality remained significant (OR = .707, $P < .05$). In Model 6, the effect for rural residence was no longer significant (OR = .822, $P > .10$). To explore these effects more fully, interaction models were conducted (not shown) and, as observed with physician visits, there were no significant interaction effects between locality size and health plan coverage. However, there were significant interaction effects between locality size and having a functional limitation (ie, need factor). Subjects who lived in semi-urban areas and had at least 1 functional limitation were 86.6% less likely to have stayed in the hospital overnight compared to their urban counterparts (OR = .1340, $P < .01$). Semi-rural subjects were 92.1% less likely than urban subjects to have stayed overnight in a hospital (OR = .07933, $P < .001$), and rural subjects were 82.4% less likely (OR = .1755, $P < .05$).

DISCUSSION

The findings from this study demonstrate disparities in health care utilization between rural and urban Mexico. Older Mexicans living in more urban areas visit physicians more frequently and are more likely to have spent an overnight stay in the hospital in the past year, relative to those living in less populated areas. Using Andersen's "model of health services" as a framework, we found 2 important results of the relationship between locality size, frequency of physician visits and hospitalization for older Mexicans.22 First, the significant difference in hospitalization between rural and urban residing older Mexicans was largely accounted for by having health plan coverage. Second, certain need factors predicted frequency of physician visits and hospitalization, although they did not explain variations between rural and urban older Mexicans.

Not having formal work-based health care coverage explained rural and urban disparities in frequency of physician visits and overnight hospital stays in this sample of older Mexicans living in Mexico. These findings are consistent with other international studies that have found disparities in health care coverage between rural and urban areas that lead to variations in health care utilization.32,33 For example, in the United States rural Hispanics report being less likely to have a regular source of health care than their urban peers.34 Moreover, Hispanics living in the Texas-Mexico border region of the United States have similar health beliefs, behaviors and barriers to care as their counterparts living just the other side of the Rio Grande.35 One study showed that rural subjects in 2 Texas counties who did not have health care coverage were less likely to receive preventive care or have consistent access to health services than their peers in more urban areas.36

Since the poor, rural and uninsured households of Mexico incur the most out-of-pocket catastrophic health care expenditures,13,14 they may be deterred from obtaining timely outpatient treatment, leading to a greater utilization of inpatient care for the same conditions. In a study of a rural migrant community in Michoacán, subjects reported local public health clinics as usually crowded, understaffed, and often out of medications and medical supplies. 16 These participants also reported that at times they would not go to the clinic to forgo the bother. Further, people with limited economic resources viewed paying for health care as a lower priority than food and shelter for their families. The results from this study, coupled with findings from other international studies, demonstrate that barriers to health care services in rural areas are due in part to health care plans or insurance programs which create disparities in access through the way they are structured and the types of populations they are designed to serve.

In a similar study of predictors in health care utilization among older Mexican Americans, need factors had the strongest association with whether subjects were hospitalized in the previous year.23 Although in this study certain need factors did significantly influence

frequency of physician visits and overnight stays in the hospital, they did not explain disparities between rural and urban residing older Mexicans. In fact, in this study subjects who had diabetes and lived in rural Mexico were significantly more likely to visit a physician than their urban counterparts without diabetes. This fact demonstrates that, despite the challenges that exist in rural settings, older Mexicans with chronic diseases such as diabetes find ways to see a physician.

One explanation for these findings is that health care services are not accessible in rural areas and not having insurance is really a proxy for lack of available facilities. For older persons with multiple co-morbidities or a disability, having to travel long distances may serve as a deterrent to seek physician care. This theory is somewhat supported by the fact that interaction effects were significant between locality size and having at least 1 functional limitation on the likelihood subjects would spend at least 1 night in the hospital. Subjects who lived in more rural areas and had at least 1 functional limitation were significantly less likely to have been hospitalized overnight in the past year. Older Mexicans in rural areas may wait until their illness has advanced to a critical state before traveling to a hospital.

This study has some limitations. First, with the current data, we cannot determine which aspects of not having insurance create differences between rural and urban older Mexican populations. Does not having insurance lead to more out-of-pocket expenses, or is it a proxy for lack of health care services in rural areas? The MHAS data do not include community-level variables that would help tease out this relationship. Future studies are indicated to disentangle the relationship between rural residence, health plan coverage, and health services use. In addition, because this sample is of subjects 50 years and older, it will be important to conduct similar studies on younger Mexicans to verify the effects of not having work-based health care on health service utilization across the life course. Despite limitations, this study illuminates an important difference between rural and urban health care access for older Mexicans and serves as a starting point for future studies.

The Mexican government in 2004 began to implement a health care program to provide universal access to health care services by the year 2011.37 The Seguro Popular de Salud will allow Mexican families without insurance to utilize the work-based health care systems IMSS or ISSSTE at no or little cost. Special considerations must be made for older Mexicans in rural areas to determine if access to services will be adequate even with Seguro Popular and whether the IMSS and ISSSTE systems in rural Mexico have sufficient resources to absorb the large uninsured older population.

The issues raised in this study are similar to those in the United States. Approximately 46.3 million Americans are uninsured. Although the proportion insured by urban/rural status differs slightly, being uninsured or underinsured is much worse in a rural setting than it is in an urban setting in both countries. The rural uninsured are less likely to receive preventive care and more likely to have used an emergency room for non-emergent care.38–41 Furthermore, rates of uncontrolled chronic diseases and undetected cancer are much higher among the rural uninsured.42–43 Therefore, any plans to restructure the US health insurance system will need special provisions for rural America.

The international population is aging quickly. The elderly are more likely than their younger counterparts to live in rural areas.2 It is critical, therefore, for health policy makers to recognize and address the distinct needs of older persons living in rural areas. Specialized programs to improve health care access are vital to avert continued inequality.

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Table 1

Weighted descriptive statistics for predisposing, enabling and need factors by size of locality at baseline for the MHAS sample.

Independent Variable	Total	Urban	Semi-Urban	Semi-Rural	Rural	Significance Test
Average Physician Visits (mean ± SD)	4.19 (5.38)	4.62 (5.68)	4.07 (5.28)	3.93 (5.21)	3.59 (4.89)	8.9 (.000)
Any Hospitalization (%)	898 (9.86)	573 (10.67)	141 (10.27)	74 (10.73)	110 (7.79)	13.69 (.003)
Predisposing Factors						
Age (mean ± SD)	62.4 (9.7)	61.5 (9.1)	61.6 (9.4)	62.8 (9.6)	64.1 (10.5)	13.4 (.000)
Sex (%)						
Female	3,512 (53.7)	1,972 (57.8)	545 (54.4)	330 (52.0)	665 (46.7)	42.3 (.000)
Male	4,368 (46.3)	2,722 (42.2)	660 (45.6)	369 (48.0)	617 (53.3)	
Marital Status (%)						
Married	4,124 (50.6)	2,366 (48.6)	625 (53.4)	398 (53.8)	735 (51.1)	25.9 (.000)
Not Married	3,756 (49.4)	2,328 (51.4)	580 (46.6)	301 (46.2)	547 (48.9)	
Migration History (%)						
Never Migrated	7,209 (92.6)	4,330 (93.4)	1,117 (94.1)	625 (90.0)	1,137 (91.7)	22.5 (.000)
Previous Migrant	671 (7.4)	364 (6.6)	88 (5.9)	74 (10.0)	145 (8.3)	
Enabling Factors						
Years of Formal Education (mean ± SD)	4.0 (4.2)	5.7 (4.7)	3.7 (3.6)	2.6 (3.4)	1.6 (2.2)	269.9 (.000)
Health Plan Coverage						
No	4,840 (53.4)	3,451 (26.3)	716 (44.5)	298 (63.7)	375 (75.9)	956.0 (.000)
Yes	3,040 (46.6)	1,243 (73.7)	489 (55.5)	401 (36.3)	907 (24.1)	
Economic Situation (%)						
Excellent/Very good/Good	1,545 (18.3)	1,095 (24.4)	201 (15.2)	89 (11.8)	160 (12.2)	204.0 (.000)
Fair	4,989 (62.6)	2,948 (61.4)	809 (68.6)	453 (65.6)	779 (60.2)	
Poor	1,346 (19.1)	651 (14.2)	195 (16.2)	157 (22.6)	343 (27.6)	
Number of Children (mean ± SD)	5.0 (3.2)	4.4 (2.9)	5.4 (3.3)	5.6 (3.1)	5.8 (3.5)	81.2 (.000)
Need Factors						
Medical Conditions (%)						
Arthritis	1,658 (20.3)	983 (18.9)	251 (22.5)	142 (20.7)	282 (21.3)	.99 (.804)
Diabetes	1,203 (13.8)	803 (18.7)	183 (11.7)	86 (11.5)	131 (7.2)	42.3 (.000)
Heart Attack	245 (2.6)	168 (2.8)	28 (3.0)	16 (2.2)	33 (2.2)	8.7 (.034)
Hypertension	2,930 (35.0)	1,843 (39.1)	426 (32.5)	236 (34.2)	425 (29.2)	22.8 (.000)

Independent Variable	Total	Urban	Semi-Urban	Semi-Rural	Rural	Significance Test
Stroke	177 (2.1)	101 (2.0)	33 (2.3)	13 (1.8)	30 (2.1)	2.04 (.562)
Bone Fracture	1,036 (12.6)	638 (13.6)	168 (14.8)	83 (10.1)	147 (10.8)	5.64 (.130)
Cancer	141 (1.8)	99 (2.2)	11 (1.5)	10 (1.4)	21 (1.7)	8.7 (.034)
Depressive Symptom (0 – 9 scale) (mean ± SD)	4.3 (1.9)	4.1 (1.8)	4.2 (1.9)	4.4 (2.0)	4.6 (2.0)	4.4 (.000)
Any ADL limitation (%)	179 (2.3)	115 (1.8)	28 (2.0)	16 (1.9)	20 (3.6)	3.6 (.307)
Total n=	7,880 (100.0)	4, 494 (47.2)	1,205 (13.7)	699 (12.8)	1,282 (26.3)	

SD = standard deviation

Table 2

Regression results for frequency of physician visits in the previous year for MHAS participants.[1]

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Locality Size (Urban)						
Semi-Urban	−.552	−.530	−.600†	−.280	−.196	.042
Semi-Rural	−.694*	−.715*	−.813*	−.121	−.369	.168
Rural	−1.03***	−1.03***	−1.14***	−.230	−.515*	.181
Predisposing factors						
Age (years)		.052***	.050***	.038**	.034**	.024*
Sex (female)		1.40***	1.39***	1.26***	.853***	.776***
Marital Status (married)		.455*	.423†	.301	.552**	.450*
Migration History (Never migrated)		.265	.267	.258	.142	.146
Enabling Factors						
Years of Formal Education			.008	−.047	.022	−.024
Economic Situation (Excellent/very good/ good)						
Fair			.347	.396	.237	.276
Poor			.644	.973*	.215	.491
Number of Children			.046	.023	−.003	.046
No Insurance Coverage				−2.27***		−1.86***
Need Factors						
Medical Conditions						
Arthritis					−.074	−.073
Diabetes					3.42***	3.19***
Heart Attack					2.27*	2.08†
Hypertension					1.68***	1.59***
Stroke					.093	.077
Bone Fracture					.356	.299
Cancer					.560	.703
Depressive Symptom (CES-D 0 – 9					.171***	.173***

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
scale)						
Any ADL limitation (yes)					2.15†	2.26*
n	7880	7880	7880	7880	7880	7880
Psuedo R^2	.01	.03	.03	.06	.13	.15

[1] Results are reported in regression coefficients.

† $P < .10$,

* $P < .05$,

** $P < .01$,

*** $P < .001$

Table 3

Logistic regression results for any overnight stay in the hospital (n = 7880).[1]

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Locality Size (Urban)						
Semi-Urban	.959	.952	.899	.961	.975	1.03
Semi-Rural	1.00	.965	.916	1.06	1.00	1.13
Rural	.707*	.649**	.616**	.746	.707*	.822
Predisposing Factors						
Age (years)		1.03***	1.03***	1.02***	1.02***	1.02**
Sex (female)		.973	.961	.941	.883	.872
Marital Status (married)		1.01	.935	.917	.939	.924
Migration History (Never migrated)		.990	.975	.968	.945	.942
Enabling factors						
Years of Formal Education			1.00	.991	1.00	.992
Economic Situation (Excellent/ very good/ good)						
Fair			1.10	1.11	1.10	1.11
Poor			.881	.945	.877	.921
Number of Children			1.06**	1.06**	1.06**	1.05*
No Insurance Coverage				.625**		.682*
Need Factors						
Medical Conditions						
Arthritis					.890	.888
Diabetes					1.58**	1.51**
Heart Attack					2.41**	2.33**
Hypertension					1.68***	1.65***
Stroke					1.02	1.01
Bone Fracture					.879	.870
Cancer					.443	.449†
Depressive Symptom (CES-D 0 – 9 scale)					.967	.968
Any ADL limitation (yes)					1.41	1.45

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
n	7880	7880	7880	7880	7880	7880
Psuedo R^2	.00	.01	.02	.02	.04	.04

[1]Results are reported in Odds Ratios.

†*P* < .10,

**P* <.05,

***P* <.01,

****P* <.001