Crossing to Mexico for Health Care: An Alternative for Border Residents

By

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Many U.S. border residents have traditionally resorted to traveling to Mexico to fulfill their health care needs. Due to the unique interdependence of communities on both sides of the U.S.-Mexico border, crossing the international boundary to seek goods and services in the neighboring country is a common and accepted practice – and health care is not the exception. This thesis analyzes the personal, economic, cultural, and health insurance characteristics of Hispanic U.S. border residents who go to Mexico for health care purposes, and examines which characteristics are the strongest predictors of this trans-border practice. While the present research project explores the cross-border utilization of health care services by border residents, it is not about border crossing *per se*. Instead, this study is about health care access at the U.S.-Mexico border, and about how Hispanic border residents adapt and seek alternatives to the barriers they face.

Communities on both sides of the U.S.-Mexico border have historically experienced a very unique and inextricable interdependence. In regards to health care, the proximity and the shared history and culture have made it easy for U.S. border residents to seek care and/or buy medications in the neighboring country. Cross-border patient mobility is not a new phenomenon, but, in fact, a practice that has continued over the years despite great changes and advances in the health care system and in the way health care is sought and provided. Thus, it is evidenced that health care preferences do not respect borders and individuals use the services that are more easily accessible to them (Guendelman 1991).

While health is influenced by the beliefs and attitudes of individuals and groups, it is also affected by the specific environment in which they live (Bruhn 1997). The border region confronts some of the most dramatic health disparities in the country (United States-Mexico Border Health Commission [BHC] 2010a). For instance, approximately 23% of border residents

lack health insurance, considerably higher than the national uninsurance rate of 14.7% (BHC 2010b). Disparities are also created by an inadequate number of health care providers servicing border communities. Seventy-three percent of border counties are classified as Medically Underserved Areas (MUAs) and 63% are designated Primary Care Health Professional Shortage Areas (HPSAs)[1] (National Rural Health Association 2010). Despite these alarming statistics, when dealing with border issues, trade, immigration, and security usually top the list of priorities and, unfortunately, health is a topic too often ignored.

There are no official figures that track cross-border utilization of services. Homedes and Ugalde (2009) estimate that, along the Texas-Mexico border, approximately 20 to 30 percent of border residents cross to Mexico for health purposes. This trans-border practice is made possible due to the cultural and geographic proximity between communities on both sides of the border (Fernández and Amastae 2006; Laugesen and Vargas-Bustamante 2010), as well as border residents' familiarity with U.S. and Mexican formal and informal structures and networks which make it possible to easily navigate from one health care system to the other. All of this makes Mexico a viable alternative used to circumvent the structural, institutional, and financial obstacles to health care. This consideration of Mexico as an alternative or safety net for affordable and accessible health care is echoed by many scholars (Bastida, Brown, and Pagán 2008; Homedes and Ugalde 2009; Landeck and Garza 2002; Laugesen and Vargas-Bustamante 2010; Miller-Thayer 2010; Seid et al. 2003; Wallace, Mendez-Luck, and Castañeda 2009).

The fact that border residents have traditionally relied on Mexican health care services indicates the existence of structural deficiencies in the border region, as well as the United

[1] MUAs are identified by the Health Services and Resources Administration (HRSA) as areas having "too few primary care providers, high infant mortality, high poverty and/or high elderly population". On the other hand, HPSAs are identified as areas lacking primary medical care, dental or mental health providers and "may be geographic (a county or service area), demographic (low income population) or institutional (comprehensive health center, federally qualified health center or other public facility)" (HRSA, http://muafind.hrsa.gov/)

States' failure to meet the health care needs of its population – be it in terms of accessibility, availability, quality, or cultural competence (Bastida et al. 2008; Landeck and Garza 2002; Laugesen and Vargas-Bustamante 2010; Wallace et al. 2009). Despite this, the accessibility problems that motivate individuals to seek care in Mexico "have never had any significant political impacts on the perceived flaws of the [U.S.] domestic health care system" (Laugesen and Vargas-Bustamante 2010:229), and, to a certain degree, border health care authorities accept this practice (Homedes and Ugalde 2009). Accordingly, Su et al. (2011) argue that "a large-scale medical arrangement has evolved de facto" (p. 9) at the border. Evidence of this is the City of Laredo Public Health Director's comments that Nuevo Laredo [Mexico] used to be an outlet that relieved the pressure on Laredo's health care system (H. Gonzalez, personal communication, June 17, 2011). Citing E.R. Stoddard's *Doctrine of Mutual Necessity*, Bruhn (1997:xvi) suggests that this trans-border practice benefits both sides because they are equally functional. That is, the U.S. border health care system informally approves the cross-border utilization of medical services, and the Mexican health care system flourishes with a constant inflow of patients (Su et al. 2011). This study seeks to contribute to the literature and to influence policy by creating awareness of the health care barriers at the border, which motivate people to seek care outside of the domestic health care system.

Significance of the Study

Hispanic border residents' utilization of Mexican health care services has public health implications beyond the border region. According to Steve Murdock, former Director of the U.S. Census Bureau and former Texas state demographer, "Texas will have virtually no Whites by 2040" (Daily Mail Reporter 2011). It is expected that Hispanic children will account for almost two-thirds of Texas children by 2040 (Murdock et al. 2010). This demographic shift makes it

crucial to start formulating and implementing effective and culturally appropriate policies to address the barriers encountered by Hispanics in the health care arena.

Due to the large proportion of Hispanic residents along the border, this region can provide valuable insights into the health care barriers experienced by Hispanics and the way they seek and receive care. In this context, the present study's findings shed light on the characteristics that influence Hispanic's decision to choose the Mexican health care providers over those operating in the U.S. This information may be valuable to identify key elements that must be taken into consideration when creating policies to address Hispanic health.

BACKGROUND

Cross-border utilization of health services began to be widely studied during the 1990s following a wave of border studies that resulted from the establishment of the North American Free Trade Agreement (Bruhn 1997). Close attention was kept on this practice during the 2000s and, as a result, literature in academic journals has been steadily growing. These studies have mainly focused on Hispanics of Mexican origin given that this group represents the majority of the population living in the border region – ranging from 76% to 96% of the total population in some counties.

There are other studies that analyze non-Hispanic White's practice of traveling to Mexican border cities for low-cost medical, dental and pharmaceutical services, mainly the so-called snowbird population – seasonal residents, usually retirees, who spend the winter in southern states to avoid the cold weather in the North (see Judkins 2007). This phenomenon is usually referred to as *medical tourism*, a practice in which patients from developed countries travel to less developed nations primarily to seek more affordable medical services (Horowitz,

Rosensweig, and Jones 2007). In addition, medical tourism also suggests that the trips to other countries for health purposes also include leisurely travelling (Glinos et al. 2010).

Given the unique trans-border dynamics of the region, patient mobility across the U.S.-Mexico international boundary involves a web of demographic, social, cultural, and linguistic factors. For this reason, the literature tends to focus on the structural and sociocultural issues that frame this health care practice. Wallace and colleagues (2009) argue that cross-border patient mobility is influenced by issues of accessibility, affordability, availability, and cultural acceptability in the provision of health care services on the U.S. side of the border. Thus, the motivators for seeking Mexican health services could include one or several factors, such as lower costs, speedier service, better availability of physicians, greater linguistic and cultural concordance, and better quality of services in Mexico (Guendelman 1991).

Accessibility

Access to health care is a complex and broad concept that encompasses a variety of aspects including affordability, availability, adequacy, and cultural acceptability of services (Gulliford et al. 2002; Landeck and Garza 2002). Accessibility refers to "the patient's ability to gain entry into the health care system with minimal barriers" (Landeck and Garza 2002:5). Obstacles to having adequate access to health services are a combination of individual, social, and structural factors. Individual and social barriers include difficulty to navigate the health care system, poor knowledge of community services, language barriers, location of residence, employment without health benefits or sick days, low educational attainment, low socioeconomic status, and lack of health insurance (Gulliford et al. 2002; Landeck and Garza 2002). Structural barriers include bureaucratic processes, shortages of health providers, few providers that accept public insurance, distance of health facilities, long waiting times, and lack

of translation services (Hicks 1990; National Research Council 1993). Many of these barriers have historically been present in the border region. As a result of accessibility problems, border communities have faced significant challenges in the way they seek and receive health care services (Bruhn 1997; Su et al. 2011).

Affordability

From a national health perspective, there is a close relationship between sociodemographic factors and access to health care suggesting that accessibility is a function of social class (Mechanic 1983). This idea is maintained in studies of cross-border health utilization, most of which contend that the high rates of poverty and low rates of health insurance at the border further hinder the border population's ability to access the health care system. In this context, some researchers suggest affordability is one of the most important predictors of cross-border patient mobility. In other words, it is argued that the poor, the uninsured, and the under-insured are most likely to seek health care across the border because of the considerably lower costs of Mexican health services (Bastida et al. 2008; Laugesen and Vargas-Bustamante 2010; Vargas Bustamante, Ojeda, and Castañeda 2008; Wallace et al. 2009).

Lack of health insurance. Patients might be motivated to seek more affordable care outside their country of residence if they are not covered by health insurance and must pay out of pocket for their medical expenses (Glinos et al. 2010). The high level of uninsurance at the border is considered a key factor influencing the decision to utilize Mexican health care services (Bastida et al. 2008; Landeck and Garza 2002; Laugesen and Vargas-Bustamante 2010; Su et al. 2011; Vargas Bustamante et al. 2008; Wallace et al. 2009). Uninsurance rates at the border are well above the national levels. California, Arizona, New Mexico and Texas, all border states, account for over 30% of the total U.S. uninsured population, thereby having the highest rates of

uninsurance in the United States (Bastida et al. 2008). In Texas, 80% of the uninsured live in border counties (Homedes and Ugalde 2009).

The low rates of health insurance coverage at the border could be explained by the low wage structure which, inevitably, makes insurance unaffordable (Bastida et al. 2008), and by the types of jobs prevalent among the Mexican-American population (i.e., part-time and/or low-skilled jobs that do not offer health insurance benefits) (Landeck and Garza 2002; U.S. Department of Health and Human Services 2005). In this context, the lack of health insurance makes health care services unaffordable to a considerable proportion of the border population. This, in turn, might be an important factor influencing the population to resort to the more affordable and predictable costs of Mexican health care services. For example, the cost of medications in Mexico is approximately 70 to 90 percent lower than in the U.S. (Su et al. 2011). Many nonnarcotic drugs can be bought not only at a lower price but also without prescription, and this makes medications even more affordable. However, practitioners and scholars alike have expressed their concerns over U.S. border residents who buy antibiotics in Mexico without medical diagnosis[2] (Judkins 2007; Su et al. 2011).

The influence of health insurance coverage on cross-border patient mobility is supported by a multitude of findings. For example, a study of cross-border patient mobility in California indicated that 7.1% of uninsured individuals sought health care in Mexico, compared to 1.4% of those with insurance (Laugesen and Vargas-Bustamante 2010). Another study of Mexican immigrants in California revealed that uninsurance increased the likelihood to obtain medical, dental and pharmaceutical services in Mexico (Wallace et al. 2009). Other studies even propose

[2] In 2010, Mexican Congress approved a law prohibiting the sale of antibiotics without prescription. As a response to this new law, many pharmacies started offering in-house and low cost medical consultations. This strategy has allowed patients to have easy access to a physician and, if needed, to a prescription for antibiotics. Further research is suggested to study whether patients living on the U.S. side of the border make use of physician services available in pharmacies.

that the lower health care costs in Mexico may in fact encourage border residents to forgo health insurance all together (Homedes and Ugalde 2009; Laugesen and Vargas-Bustamante 2010). Thus, there is general agreement that cross-border utilization of health care services is mainly motivated by the availability of more affordable and accessible health services. In addition, Mexican health care services also serve as a supplement for the *underinsured* – that is, that some individuals do in fact have some coverage, but it does not cover all of the patients' health care needs or the co-payments as too high (Glinos et al. 2010; Miller-Thayer 2010). This generalized idea can be summed in Laugesen and Vargas-Bustamante's (2010) argument that U.S. residents who travel abroad for medical services "do not do so because it is a luxury or choice: rather, they travel because it provides a level of health care coverage that some people would otherwise be unable to afford" (p. 225).

Refuting the Poverty Argument. While the price differential in medical and pharmaceutical services is an important predictor for seeking services in Mexico, many studies have found that poverty is not necessarily a significant predictor for this cross-border health practice. Results in Bastida et al. (2008) and Wallace et al.'s (2009) studies indicated that poverty did not have an effect on use of Mexican medical services or purchase of medications and, in some cases, reduced the odds of utilizing Mexican dental services. A possible explanation could be that low-income individuals may be more likely to receive free or reduced health services through Medicaid or Medicare and, thus, obtain medical services in the U.S. In addition, since Mexican services must be paid out-of-pocket, people with lower incomes may be unable to afford them (Bastida et al. 2008). If this were correct, then, as González-Block and de la Sierra-de la Vega (2011) argue, the strongest predictor of cross-border health care utilization is lack of health insurance, not poverty.

The diversity of admission diagnoses and services utilized in Mexico supports this argument due to the diverse socioeconomic backgrounds of patients who seek care across the border. A study of Mexican migrants who returned (temporarily or permanently) to Mexico for health reasons revealed the types of admissions into public and private hospitals in six Mexican border cities (González-Block and de la Sierra-de la Vega 2011). Public hospitals mainly admitted patients due to traumatisms, animal bites and dehydration, respiratory diseases, and HIV/AIDS. On the other hand, private hospitals primarily admitted higher-income migrants who were legal U.S. residents for elective surgery, diabetes, and other chronic diseases. Another study surveyed Mexico-born individuals to determine if there was willingness to pay for a hypothetical cross-border health insurance plan that would offer comprehensive coverage in Mexico and limited coverage in the U.S. (Vargas Bustamante et al. 2008). Sixty-two percent of respondents were willing to pay for this product, with the strongest predictors being lack of U.S. insurance, having insured dependents in Mexico, and sending remittances for health care purposes. Interestingly, willingness to pay increased with income.

Familiarity

Scholars have acknowledged the existence of a prevalent and simplistic assumption of cost in trans-border health care literature (Wallace et al. 2009), as well as a need to further examine the social, cultural and demographic factors that motivate patients to seek care in Mexico (González-Block and de la Sierra-de la Vega 2011). Glinos et al. (2010) argue that familiarity is one of the main motivators for international patient mobility, particularly in border regions and among migrant populations, because it helps patients feel comfortable in situations of vulnerability or illness. Familiarity includes being familiar with the health care system, feeling

at ease with providers and/or being able to speak one's language (Glinos et al. 2010; Laugensen and Vargas Bustamante 2010).

Ethnic minorities are usually in ethnic-discordant relationships with health professionals and, as a result, rate the quality of interpersonal care more negatively than Whites (Johnson et al. 2004). For example, studies have found that minority patients prefer to seek treatment from physicians from their own racial/ethnic group as they feel higher levels of trust, comfort, and interpersonal similarities with them (Brown et al. 2007). In this sense, there are certain cultural aspects of Mexican care that might attract border residents. As would be expected, language plays an important part in an individual's decision to seek care in Mexico. However, at the border the majority of physicians, nurses, and other health care professionals are Hispanic and bilingual like the patients. Thus, feeling comfortable with health care services not only involves being able to speak one's language, but also knowing the health care system and trusting the providers. For example, trust could be motivated by more familial attitudes, personal attention and/or patient-centered care from Mexican health providers compared to U.S. providers (Seid et al. 2003).

Familiarity and culture in health care are especially important among Mexican immigrants. For instance, a study of Mexican farmworkers revealed that one out of two respondents who had lived in the U.S. over half of their adult life still preferred Mexican health care over American care (Glinos et al. 2010). However, the attachment to Mexico and, inevitably, to Mexican health care services diminish as individuals become more assimilated into the U.S. language and lifestyle. For example, a study of Mexicans living in California found that 9% of those born in the US sought medical services in Mexico, compared to 80% who were born in Mexico (Wallace et al. 2009). In short, familiarity with the language, with the health care

system, with physicians and providers, and with cultural values influences a person's decision to seek care in Mexico (Glinos et al 2010).

Availability

The availability of services is an important factor determining the adequacy in the provision of health care (Landeck and Garza 2002). Availability as a motivator of cross-border patient mobility is based on the quantity of services available and/or the type of services available (Glinos et al. 2010). Poor availability of services is commonly a barrier to health care at the border, and it is often easier and faster to access health care services in Mexico. For example, Mexican public and private hospitals as well as physicians' offices usually accept walk-ins and are open longer hours and during the weekends (Homedes and Ugalde 2009).

The border region faces many availability issues due to a shortage of health providers, clinics and hospitals. The scarcity of health providers makes it difficult even for people with health insurance to get appointments with physicians and/or to obtain the medical services that are needed. The scarcity problem becomes magnified for people who depend on public programs such as Medicaid or Medicare given that it is not a requirement for medical providers to accept public health insurance as a form of payment (Landeck and Garza 2002).

The scarcity of providers could also have a toll on the quality of services provided due to the strains caused by the gap between supply and demand. Bastida et al. (2008) and Su et al. (2011) observed in their studies that respondents who considered themselves as having poor health were more likely to seek Mexican medical services, even if the respondents were insured. On the other hand, Wallace et al. (2009) discovered that poor health reduced the likelihood of seeking care in Mexico, while chronic conditions increased it. Despite differing results, Su et al. (2011) and Wallace et al. (2009) arrived to a similar conclusion: individuals with greater health

needs and who require faster and more personal medical attention (e.g., poor health or chronic conditions) are more likely to utilize Mexican medical services.

The preceding review of literature drew from studies focused on the cross-border use of health care services as well as from studies which dealt with broader issues such as access to health care and Hispanic health. In synthesis, the existing literature suggests that many U.S. border residents resort to Mexico to meet their health care needs mainly due to lack of health insurance and an insufficient provision of health care services. While there is general agreement that this cross-border practice is motivated by the substantial price gap in Mexican doctor's fees and medications, it has been shown that poverty is not a significant predictor (Bastida et al. 2008; González-Block and de la Sierra-de la Vega 2011; Wallace et al. 2009). Cultural factors such as language and cultural competency have also been found to exert significant influence; yet scholars have noted that most minority health policy approaches have traditionally paid more attention to accessibility and, to a certain degree, have disregarded important cultural and social motivators (Pincus et al. 1998; Wallace et al. 2009).

RESEARCH QUESTIONS

The research questions addressed in this study were: (1) What are the characteristics of Hispanic border residents that cross to Mexico for health care? (2) Are those characteristics consistent for all types of health care services sought in Mexico? (3) What personal, affordability, and familiarity factors predict cross-border use of Mexican health services?

DATA AND METHODS

Study Location

This research took place in the City of Laredo, Webb County, Texas[3]. Webb County is representative of the social and economic issues faced by communities along the U.S.-Mexico border. Even though Laredo is the largest land port in the United States and the most important port of entry into Mexico, its commercial importance is not reflected in the socioeconomic wellbeing of the population. Thirty percent of the population lives below the poverty level, significantly higher than the overall levels in the U.S. (13.5%) and Texas (16.8%; U.S. Census Bureau, 2009b). This has a direct impact on the population's access to health care: one out of three Webb County residents do not have health insurance coverage (U.S. Census Bureau Small Area Health Insurance Estimates 2009). Additionally, due to a shortage of health care providers, Laredo is a federally designated Mental Health HPSA and a partial Primary Care HPSA. This mirrors the situation along the entire Texas border where 63% of border counties are designated as HPSAs for primary medical care and 95% for mental health care (Olson and Tapia 2009).

Webb County experiences a unique bicultural setting where Mexican and American economic, political, social and cultural value systems merge creating a complex combination of health beliefs and practices. Of particular relevance is the demographic composition. According to the 2010 Census, Hispanics account for 95.7% of the population in Webb, making it the county with the largest Hispanic population in the nation. Within that population, 87.1% are of Mexican descent (U.S. Census Bureau, 2010). In addition, 91.3% of the population 5 years and older speaks Spanish at home (U.S. Census Bureau, 2009a).

Sample Design

[3] Laredo is the county seat and accounts for 94% of the county population.

The study was a secondary analysis of data of the Community Household Survey conducted in Webb County, Texas during the summer of 2011. The survey was part of a larger project called the Laredo/Webb County Community Health and Workforce Needs Assessment led by the Mid-Rio Grande Border Area Health Education Center, the University of Texas Health Science Center San Antonio, the City of Laredo Health Department, and Texas A&M International University. This assessment was funded by the Centers for Disease Control and Prevention and had the objective of evaluating the needs and the concerns of the residents of Laredo/Webb County, Texas. The project was reviewed and approved by the TAMIU Institutional Review Board.

Surveys were conducted through face-to-face interviews by TAMIU students. The survey instrument, available both in English and Spanish, consisted of 241 items that were grouped under 38 primary questions (see Appendices A and B). The topics addressed were: neighborhood and quality of life, transportation, health and medical issues, education and workforce development, older adults, and children and youth. This analysis focused on the question measuring cross-border use of health care services.

Sampling scheme. Sampling was conducted through a multi-stage technique[4]. Households were first clustered by census tracts. Then, they were clustered again by median house values. Using data from the 2005-2009 American Community Survey 5-year estimates, Geographic Information System (GIS) software was used to map median house values throughout Webb County. Median house values were organized into 24 categories in $5,000 increments ranging from less than $10,000 to $1,000,000 or more.

[4] For the purpose of this study, the statistical analysis did not take into account all the sampling stages. Instead, it assumed a simple random sample with a super population.

With this information on-hand, out of 32 census tracts, eight (25%) were selected for the study based on their socioeconomic representativeness: 6, 12, 17.06, 17.08, 18.01, 18.03, 18.04 and 18.05. Fifty-one percent or more of the residents in census tract 18.01 have low and moderate incomes, while 70% or more of the population in census tracts 6, 12 and 18.04 have low and moderate incomes. Thus, the survey was able to capture the needs and opinions of Webb County residents living in diverse socioeconomic conditions. To ensure that each census tract was proportionally represented in the sample, a quota sampling technique based on the true proportion of the population was used to determine the number of surveys to be conducted in each tract. The quota was set at 2.73% of the total number of households per census tract. For instance, tract 6 has 1,293 households and tract 18.01 has 5,018 households. Therefore, 35 and 137 households, respectively, were surveyed in each census tract.

Bastida et al. (2008), Wallace et al. (2009), and Su et al. (2011) argue that most studies of cross-border health utilization are based on small-scale, limited, and non-representative samples that only focus on specific health care services or on participant observations. In contrast, the present study utilized data from a representative survey with a sufficiently large sample size. Due to its methodology, the Community Household Survey provided a very representative snapshot of the demographic, social, and economic characteristics of the Laredo/Webb County population. Given the relative homogeneity among Texas border communities in terms of socioeconomic and health characteristics (Landeck and Garza 2002), findings can be generalizable to the Texas border region.

Sample characteristics. The sample size was 608. For the purpose of this research, non-Hispanics were deleted from the dataset; therefore, the sample analyzed in the present study consisted of 555 households (91.3% of the total sample). Given that almost 9 out of 10 Webb

County residents are Hispanic of Mexican origin (U.S. Census Bureau, 2010), it is assumed that the sample is almost entirely Mexican. With a median age of 35.5, the sample was slightly older than the Webb County population whose median age is 27.8 (U.S. Census Bureau, 2010). The sample was composed of 59% female and 41% male respondents. Fifty-nine percent were married, and 69% of the households contained children. Consistent with census data, only 17.1% of respondents had a college degree or higher and 59% were employed. The median reported income of $25,000 was somewhat lower than the median income of $36,684 reported by the U.S. Census Bureau (2010). The reported concern for health care was high among survey participants. Having access to better health care services was rated as the second issue most important to respondents among a list of ten quality of life issues. In addition, 87% of respondents claimed to be greatly concerned about having access to good health care services and 77% to good dental services.

Conceptual Framework

Researchers have identified several factors that may be related to border residents' use of Mexican health care services. As illustrated in the theoretical model portrayed in Figure 1, this research was guided by a conceptual framework, which grouped the predictors under four categories: personal, affordability (two dimensions: economic factors and insurance coverage), and familiarity (cultural factors). The present study took on a demand-side approach, which concentrated on the consumers of health care rather than on the delivery of care by the health care system (Glinos et al. 2010). For that reason, issues of availability were not included in the analysis.

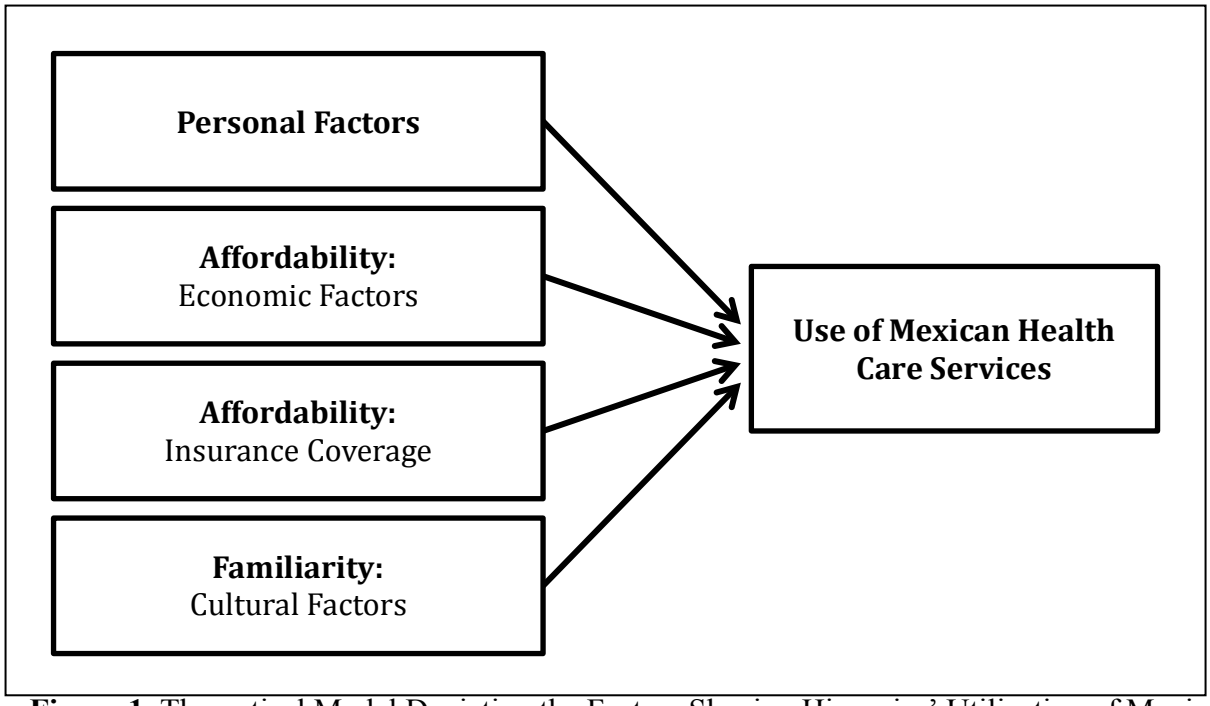

Figure 1. Theoretical Model Depicting the Factors Shaping Hispanics' Utilization of Mexican Health Care Services.

Variables Used in the Analysis

Dependent variables. The survey asked: "Do you go to Nuevo Laredo [Mexico] for your health needs?" Then, a list of health care services – medical, dental, pharmaceutical, vision, mental health and *curandero* (folk medicine) – was provided. Respondents had the option of selecting all the Mexican services that they accessed. For the purpose of this research, medical (Y_1), dental (Y_2), and pharmaceutical (Y_3) were identified as the three key dependent variables[5]. Each variable was dichotomized and coded as "1" if the respondents used the service or "0" if they did not.

A fourth dependent variable was constructed to represent the use of at least one of these Mexican health care services (Y_4). If a respondent indicated that they used at least one of the three selected services, our fourth variable was coded as "1". On the other hand, if the

[5] The overall use of vision, mental health, and curandero services was 8.27, 7.01, and 0.03 percent, respectively. These services were excluded from the analysis given that their reported use was too low to permit meaningful statistical examinations.

respondent did not use any of the selected services, the variable was coded as "0". Given that individuals have different health needs and attitudes which shape their health behavior, the fourth dependent variable was constructed to observe the general cross-border behavior, regardless of the type of health care service sought. Most existing studies examine the utilization of only one type of service. This study contributes to the literature by examining whether the predictors vary depending on the type of service used.

Independent variables. Personal factors included five variables: age, gender, marital status, children living in the household, and educational attainment. Survey data on the ages of respondents (X_1) were expressed as ordinal measures and were measured in the following ranges: 18-25, 26-45, 46-64, and 65 or older. Since the actual age of respondents was not available, based on sociological practice, the midpoints of these categories were used (Hirschi and Gottfredson 1983). While there are biases in this procedure, using midpoints does not affect the outcome since they tend to influence the location rather than the form of the distribution (Hirschi and Gottfredson 1983). Gender (X_2) was transformed into a dummy variable wherein "1" represented male and "0" represented female. In regards to marital status (X_3), the survey included the following categories: divorced, living with partner, married, separated, single, and widowed. For this analysis, the variable was dichotomized into married ("1") and not married ("0"). The variable of children living in the household (X_4) was broken into two dummy variables to differentiate the impact of children ages 0 to 5 and children ages 6 to 18 on the outcome. "No children" was used as the reference category. Educational attainment (X_5) was measured as the highest level of education completed and categorized in the following format:less than high school, high school, some college, and college degree or more[6]. This

[6] Respondents who indicated having completed the GED were included into the category of "high school", and those with an associate degree were considered as having "some college" as the highest level of education.

variable was transformed into a dummy where "less than high school" was used as the reference category.

Affordability was analyzed using two measures: economic and insurance factors. Following Weberian thought ([1930] 2005), the economic dimension was casted as a function of income and wealth. The three variables used to empirically measure the economic dimension of affordability were: annual household income, ownership of home (1=yes; 0=no), and ownership of vehicle (1=yes; 0=no). The survey measured annual household income (X_6) by ranges: under $10,000; $10,000-$19,999; $20,000-$29,999; $30,000-$39,999; $40,000-$49,999; $50,000-$74,999; $75,000-$100,000; and over $100,000. Like age and following sociological practice, the midpoint of each income range was considered[7]. According to Weber ([1930] 2005), property and lack of property are the fundamental categories of the class system. Following this premise, in addition to household income, ownership of home (X_7) and ownership of vehicle (X_8) e were also included as economic factors.

Health insurance coverage (X_9) was used as the second measure of affordability. The survey asked respondents to indicate the source or sources of health insurance in their household. With this information three dummy variables were created: public insurance (includes Medicaid, Medicare, CHIP, and military insurance), private insurance (includes insurance coverage through employer, union, or bough directly), and both private and public insurance. The reference category was not having health insurance. Previous studies have dichotomized the insurance variable into having or not having health insurance coverage. This study makes a significant

[7] Following previous studies (Bastida et al. 2008; Landeck and Garza 2002; Su et al. 2011), it was originally intended to create three income ranges in order to compare the predictability of different household incomes on the usage of Mexican health care services. However, after running multivariate tests for multicollinearity, results indicated that the highest income level had a high variance inflation factor suggesting that it had a strong linear relation with one or more variables. Given that this high correlation could possibly bias the regression results by way of making the parameter estimates unstable (Field 2009), the household income midpoint was used instead as it did not produce multicollinearity issues. Bivariate correlative analyses of the rest of the independent variables revealed no additional problems of multicollinearity.

contribution to the literature by analyzing whether the type of insurance has a different impact on the decision to cross to Mexico for health care purposes.

Finally, language and acculturation were considered cultural factors which could influence border residents' cross-border behavior. Respondents were asked to report the language most often spoken at home (X_{10}). The categories used in this variable were Spanish, English and both[8]. This variable was transformed into a dummy using Spanish as the reference category. Length of residence in Webb County (X_{11}) was included as a proxy for acculturation and knowledge of the U.S. health care system (Wallace et al. 2009). This was measured in years as a continuous variable. Figure 2 portrays the theoretical model with the dependent and independent variables used in the analysis.

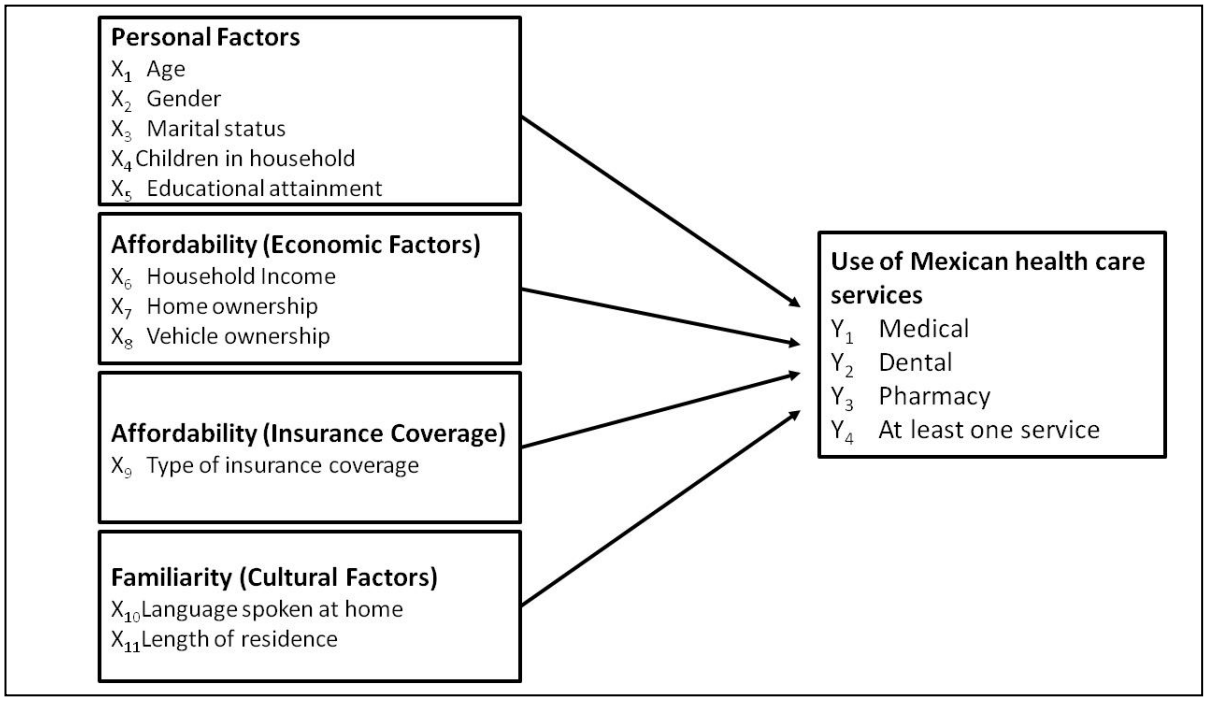

Figure 2. Theoretical Model with the Dependent and Independent Variables Used in the Analysis.

[8] The survey only included "English", "Spanish" and "Other, please specify". Nineteen percent of respondents selected "Other" and indicated "bilingual". For this reason, a third category was created to represent those households where English and Spanish were spoken equally.

Analytical Strategy

Data were analyzed using IBM SPSS 20 (SPSS, Chicago, IL). SPSS was used to recode, compute, and transform predictors into dummy variables as needed. Descriptive statistics were calculated for all variables. Given that the outcomes for all four dependent variables were dichotomous (yes=1, no=0), binary logistic regression analyses were conducted to determine the probability of crossing to Mexico for medical (Y_1), dental (Y_2), pharmaceutical (Y_3), and at least one type of health care service (Y_4).

Binary logistic regression is based on the assumption that Y takes only two values: 0 and 1. Unlike linear regression, the outcome in binary logistic regression is not a prediction but a probability of Y taking the value of 1 (Burns and Burns 2008; Field 2009). For this, it utilizes a binomial probability theory and a maximum likelihood method to estimate the coefficients of the model (Burns and Burns 2008). With regards to sample size, linear regression needs a minimum of ten cases per independent variable (Field 2009). For binary logistic regression it is recommended to have at least 50 cases per predictor given that the maximum likelihood coefficients are large sample estimations (Burns and Burns 2008). The sample utilized in this research (n=555) is sufficiently large for the eleven predictors in the analysis.

RESULTS

Three research questions guided the study: (1) What are the characteristics of Hispanic border residents that cross to Mexico for health care? (2) Are those characteristics consistent for all types of health care services sought in Mexico? (3) What personal, affordability, and familiarity factors predict cross-border use of Mexican health services?

Table 1 provides a description of each dependent and independent variable, the mean, standard deviation, and range. The frequency distribution of the outcome variables revealed a high proportion of cross-border use of Mexican health care services among Hispanics living in Webb County, Texas. Over a third of respondents reported using medical (36%), dental (32%), and pharmacy (34%) services. Moreover, almost half use at least one health care service (47%). A similar health assessment carried out in Webb County in 1995 discovered that 41.2% of respondents crossed to Mexico for health purposes (Landeck and Garza 2002).

With regards to the personal factors, 41% of respondents were male and more than half were married. The educational level was low but consistent with census data given that three out of five respondents had high school education or less. While over a third of households did not have any children, one third of the households had children ages 0 to 5 and more than half had children ages 6 to 18.

Economic factors revealed that, although annual household income was low (mean: $39,000; median: $25,000), 65% of respondents owned their home and that at least one vehicle was owned in 92% of the households. Regarding health insurance, a quarter of respondents did not have any type of coverage. The public health care system covered 42% of respondents and members of their households, 28% were covered by private insurance, and only 7% had both types of insurance. As for the cultural factors, Spanish was the dominant language spoken in over half of the households (55%). Lastly, respondents had lived in Webb County an average of 26 years.

Table 1. Variables Used in the Analysis

Variable	Description	Mean	*SD*
Medical	Use Mexican medical services	.36	.48
Dental	Use Mexican dental services	.32	.47
Pharmacy	Use Mexican pharmaceutical services	.34	.47
Any service	Use of at least one Mexican health care service	.47	.49
Personal factors			
Age	Age (midpoint) of respondent	39.29	13.40
Male	Respondent was male	.41	.49
Married	Respondent was married	.59	.49
No children	No children living in household (ref)	.31	n/a
Children ages 0 to 5 in household	Household with children ages 0 to 5	.34	.47
Children ages 6 to 18 in household	Household with children ages 6 to 18	.54	.50
Less than high school education	Respondent's highest level of education was < high school (ref)	.27	n/a
Only High school diploma	Respondent's highest level of education was high school	.33	.47
Some college education	Respondent's highest level of education was some college work	.24	.43
College degree or more	Respondent's highest level of education was college degree or more	.17	.38
Economic factors			
Household Income	Annual household income (midpoint), in thousand US$	30.22	26.18
Home ownership	Home was owned by a household member	.65	.48
Vehicle ownership	At least one vehicle in the household	.92	.28
Insurance Coverage			
No insurance	Members of household not covered by health insurance (ref)	.23	.43
Public insurance	Members of household covered by public insurance	.42	.49
Private insurance	Members of household covered by private insurance	.28	.45
Public and private insurance	Members of household covered by public and private insurance	.07	.26
Cultural factors			
Spanish	Spanish was most often spoken at home (ref)	.55	n/a
English	English was most often spoken at home	.27	.44
Bilingual	English and Spanish were equally spoken at home	.19	.39
Length of residence	Years living in Webb County	25.65	14.36

Tables 2 through 5 present the results from the binary logistic regressions conducted for each of the outcome variables. A nested set of models were carried out using the following categories of variables: personal, economic, insurance, and cultural factors. Positive coefficients indicate an increased likelihood of utilizing Mexican services. Standard errors are shown in parentheses.

The analysis begins in Table 2 with the binary logistic regression of use of Mexican medical services (Y1). Model 1 includes only personal factors. A Hispanic border resident is most likely to use Mexican medical services if there are children ages 6 to 18 living in the household. This variable maintains its significance and direction in all subsequent models. Interestingly, its strength increases with the addition of variables. On the other hand, individuals are less likely to cross if they have studied some college or have earned a college degree or more (compared to having completed less than high school, which was the reference category). However, these two variables cease to be significant as more variables are added in successive models. Their coefficients even change directions in models 3 and 4.

Model 2 adds economic factors to the analysis. Having children ages 6 to 18 living in the household continues to increase the likelihood of crossing for medical services and, compared to the previous model, its significance increased from $p<.05$ to $p<.01$. The odds of going to Mexico for medical services also increase with a higher income, though the strength of the coefficient is weak. Model 3 adds a second measure of affordability, which was defined as having some type or types of health insurance in the household. Regardless of the source of coverage, a U.S. border resident is less likely to seek Mexican medical services if the members of the household have health insurance. This effect is stronger for those with both public and private insurance coverage. On the other hand, having a high school diploma (as the

Table 2. Logistic Regression Models for Use of Mexican Medical Services

	Models			
Predictors	1	2	3	4
Personal factors				
Age	-.012	-.010	-.015	-.005
	(.009)	(.009)	(.010)	(.011)
Male	-.042	.092	-.067	-.059
	(.211)	(.218)	(.237)	(.248)
Married	-.262	-.175	-.054	-.117
	(.221)	(.226)	(.249)	(.260)
Children ages 0 to 5	-.035	-.100	-.008	-.094
	(.230)	(.235)	(.253)	(.262)
Children ages 6 to 18	.525*	.565**	.766**	.757**
	(.214)	(.218)	(.242)	(.252)
Only high school diploma	.401	.521	.801**	1.009**
	(.267)	(.273)	(.301)	(.321)
Some college education	-.706*	-.357	.003	.330
	(.306)	(.332)	(.368)	(.387)
College degree or more	-.866**	-.175	.219	.517
	(.338)	(.414)	(.461)	(.496)
Economic factors				
Household Income	-	-.014*	-.010	-.006
		(.006)	(.007)	(.007)
Home ownership	-	-.191	-.161	-.141
		(.230)	(.251)	(.259)
Vehicle ownership	-	-.138	-.095	-.144
		(.396)	(.425)	(.438)
Insurance Coverage				
Public insurance	-	-	-1.916***	-1.757***
			(.297)	(.306)
Private insurance	-	-	-2.006***	-1.628***
			(.379)	(.396)
Public & private insurance	-	-	-2.390***	-2.130***
			(.511)	(.531)
Cultural factors				
English	-	-	-	-1.261***
				(.353)
Bilingual	-	-	-	-.121
				(.328)
Length of residence in years	-	-	-	-.034***
				(.010)
Intercept	-.019	.254	1.328*	1.678*
	(.487)	(.584)	(.655)	(.682)
-2 Log likelihood	540.577	531.797	470.525	468.066
Nagelkerke R square	.110	.135	.296	.372

Note: N=555. Standard errors in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

highest level of education completed) and having children ages 6 to 8 living in the household increase the likelihood of crossing to Mexico. After adding the insurance variables, household income becomes non-significant and remains non-significant in all subsequent models.

Finally, cultural factors are added to the analysis in Model 4. Speaking mostly English at home, compared to mainly speaking Spanish (reference category), is associated with a significant reduction in the odds of seeking medical services in Mexico. Also, the longer a person has lived in Webb County, the less likely he or she is to go to Mexico for medical purposes. Having public and/or private health insurance still has a large negative effect, but the values of the coefficients slightly decrease when the cultural factors enter the model. Having a high school diploma and children ages 6 to 18 continueexerting a positive effect on the likelihood of the outcome.

The binary logistic regression results for the use of Mexican dental services (Y2) are presented in Table 3. Model 1 includes only the personal factors, none of which significantly predict the outcome. Once the economic factors are taken into account, as shown in Model 2, high school diploma acquires significance and the odds of utilizing dental services across the border increase. However, none of the economic variables added in this model are significant predictors. Model 3 introduces the health insurance variables. All three variables reduce the likelihood of going to the dentist in Mexico, the strongest being having both public and private health insurance. High school diploma continues being associated with a significant increase in the odds of crossing for dental services.

Model 4 adds all four categories of variables into the analysis. Speaking English at home is a strong and statistically significant predictor that decreases the probability of seeking dental services in Mexico. Although less significant and with less power, a longer residence in Webb County also reduces the likelihood of seeking these services. All of the insurance variables

Table 3. Logistic Regression Models of Use of Mexican Dental Services

	Models			
Predictors	1	2	3	4
Personal factors				
Age	-.004	-.003	-.005	.002
	(.009)	(.009)	(.009)	(.010)
Male	-.359	-.313	-.451	-.457
	(.218)	(.223)	(.234)	(.240)
Married	-.427	-.400	-.337	-.408
	(.223)	(.226)	(.239)	(.246)
Children ages 0 to 5	.119	.102	.197	.139
	(.233)	(.235)	(.247)	(.252)
Children ages 6 to 18	.194	.205	.316	.300
	(.217)	(.219)	(.231)	(.238)
Only high school diploma	.529	.549*	.730*	.910**
	(.274)	(.278)	(.294)	(.309)
Some college education	-.322	-.236	.033	.299
	(.310)	(.336)	(.360)	(.374)
College degree or more	-.677	-.484	-.235	-.056
	(.352)	(.426)	(.445)	(.463)
Economic factors				
Household Income	-	-.003	.000	.005
		(.005)	(.006)	(.007)
Home ownership	-	-.159	-.121	-.115
		(.233)	(.244)	(.249)
Vehicle ownership	-	.060	.090	.051
		(.407)	(.423)	(.431)
Insurance Coverage				
Public insurance	-	-	-1.320***	-1.146***
			(.278)	(.285)
Private insurance	-	-	-1.287***	-.925**
			(.359)	(.373)
Public & private insurance	-	-	-1.908***	-1.707***
			(.517)	(.533)
Cultural factors				
English	-	-	-	-1.220***
				(.343)
Bilingual	-	-	-	-.086
				(.314)
Length of residence in years	-	-	-	-.023*
				(.009)
Intercept	-.313	-.293	.368	.578
	(.498)	(.595)	(.364)	(.648)
-2 Log likelihood	527.032	525.978	494.136	470.006
Nagelkerke R square	.079	.082	.174	.240

Note: N=555. Standard errors in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

continue to be negatively associated with the utilization of Mexican dental services, although the significance of having private insurance was reduced from p>.001 to p>.01. High school diploma continues to have a positive effect on the outcome and a stronger coefficient than in previous models. Also, its significance increased to p>.01.

Table 4 provides the regression results for the use of Mexican pharmaceutical services (Y3). Similar to the results of dental services, none of the personal factors included in Model 1 affect cross-border patient mobility for pharmaceutical services. When the economic factors are added in Model 2, household income acquires significance and indicates a reduced likelihood of buying medications in Mexican pharmacies as income increases. However, its coefficient is weak and, in fact, loses significance and power in subsequent models.

Model 3 adds the insurance factors and reveals that having any type of health insurance coverage reduces the odds of using Mexican pharmaceutical services. Although having both public and private insurance has the strongest coefficient, it also has a lower significance than the other two insurance variables (p>.01 vs. p>.001). On the other hand, an individual whose highest level of education is high school and who has children ages 0 to 5 in the household is more likely to go to a Mexican pharmacy. This is the only model where children ages 0 to 5 have a significant and positive effect on the outcome. This association disappears in subsequent models and is not present in any other dependent variable. Lastly, Model 4 includes cultural factors into the analysis. English is the strongest and most significant predictor in the model and indicates that speaking mostly English at home makes buying Mexican medications less likely. The longer a person has lived in Webb County also reduces the likelihood of this practice. All three insurance variables continue having a negative coefficient but their

Table 4. Logistic Regression Models of Use of Mexican Pharmaceutical Services

	Models			
Predictors	1	2	3	4
Personal factors				
Age	-.004	-.002	-.004	.000
	(.009)	(.009)	(.009)	(.010)
Male	-.291	-.198	-.297	-.320
	(.214)	(.220)	(.226)	(.236)
Married	-.170	-.111	-.059	-.095
	(.221)	(.226)	(.235)	(.245)
Children ages 0 to 5	.431	.408	.466*	.408
	(.227)	(.230)	(.237)	(.246)
Children ages 6 to 18	.309	.326	.377	.370
	(.215)	(.217)	(.225)	(.236)
Only high school diploma	.410	.476	.608*	.829**
	(.273)	(.278)	(.288)	(.304)
Some college education	-.243	-.004	.234	.545
	(.306)	(.332)	(.348)	(.366)
College degree or more	-.340	.173	.427	.707
	(.333)	(.412)	(.429)	(.457)
Economic factors				
Household Income	-	-.011*	-.007	-.001
		(.005)	(.006)	(.007)
Home ownership	-	-.153	-.120	-.153
		(.232)	(.238)	(.247)
Vehicle ownership	-	.241	.271	.275
		(.413)	(.423)	(.433)
Insurance Coverage				
Public insurance	-	-	-.943***	-.740**
			(.270)	(.281)
Private insurance	-	-	-1.249***	-.818*
			(.358)	(.375)
Public & private insurance	-	-	-1.262**	-1.045*
			(.463)	(.489)
Cultural factors				
English	-	-	-	-1.701***
				(.364)
Bilingual	-	-	-	-.064
				(.303)
Length of residence in years	-	-	-	-.020*
				(.009)
Intercept	-.664	-.748	-.271	-.092
	(.494)	(.603)	(.631)	(.648)
-2 Log likelihood	537.757	532.027	512.858	476.125
Nagelkerke R square	.059	.076	.133	.234

Note: N=555. Standard errors in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

significance and strength is reduced with the inclusion of the cultural factors. On the other hand, high school as the highest level of education positively predicts the outcome.

A fourth dependent variable named "use of at least one Mexican health care service" (Y4) was created to study patient mobility across the U.S.-Mexico border, regardless of the type of service sought. Results are presented in Table 5. In Model 1, just as in the use of medical services, having college education significantly decreases the likelihood of seeking any type of Mexican health care service, but this effect disappears in all succeeding models. The probability of using Mexican services increases if the household has children ages 6 to 18. When adding the economic factors in Model 2, a negative association appears between household income and using any type of Mexican health care service; however, the coefficient is very weak and loses strength and significance in the two subsequentmodels. Having children ages 6 to 18 living in the household remains a positive predictor of this outcome.

Model 3 adds the insurance variables. Having public and/or private health insurance decreases the probability of crossing to Mexico for health care. In contrast, the likelihood of this outcome increases with being a high school graduate (highest level of education) and having children ages 6 to 18 in the household. Finally, cultural factors are added in Model 4. English language and a longer residence in Webb County decrease the odds of going to Mexico for health care, with the former being a stronger and more significant predictor. The three insurance variables continue being strong negative predictors indicating a reduced probability of seeking Mexican services. High school and children aged 6 to 18 remain positive predictors of this model.

Table 5. Logistic Regression Models of Use of At Least One Mexican Health Care Service

	Models			
Predictors	1	2	3	4
Personal factors				
Age	-.008	-.007	-.009	-.002
	(.008)	(.009)	(.009)	(.010)
Male	-.027	.058	-.063	-.077
	(.207)	(.213)	(.224)	(.234)
Married	-.366	-.307	-.257	-.303
	(.217)	(.221)	(.234)	(.243)
Children ages 0 to 5	.145	.109	.181	.081
	(.226)	(.229)	(.240)	(.248)
Children ages 6 to 18	.425*	.441*	.530*	.511*
	(.207)	(.210)	(.223)	(.231)
Only high school diploma	.436	.515	.718*	.951**
	(.268)	(.273)	(.290)	(.313)
Some college education	-.848**	-.606	-.334	-.051
	(.292)	(.318)	(.340)	(.357)
College degree or more	-1.001**	-.531	-.247	-.004
	(.318)	(.391)	(.417)	(.443)
Economic factors				
Household Income	-	-.010*	-.005	.001
		(.005)	(.006)	(.007)
Home ownership	-	-.076	-.049	-.029
		(.228)	(.240)	(.248)
Vehicle ownership	-	.003	.054	.011
		(.396)	(.412)	(.421)
Insurance Coverage				
Public insurance	-	-	-1.393***	-1.187***
			(.287)	(.296)
Private insurance	-	-	-1.646***	-1.296***
			(.361)	(.382)
Public & private insurance	-	-	-1.831***	-1.638***
			(.460)	(.484)
Cultural factors				
English	-	-	-	-1.307***
				(.320)
Bilingual	-	-	-	-.052
				(.318)
Length of residence in years	-	-	-	-.025**
				(.009)
Intercept	.363	.467	1.253*	1.467*
	(.477)	(.574)	(.623)	(.643)
-2 Log likelihood	559.311	554.795	518.506	486.595
Nagelkerke R square	.130	.143	.238	.315

Note: N=555. Standard errors in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

The statistical analysis ends with a side-by-side comparison of Model 4 of each of the outcome variables. Table 6 allows an assessment of whether the same factors predict the use of all Mexican services and to determine which outcome is better explained by the predictors in the study. As illustrated by this table, most of the same predictors are significant across all four outcomes, but the strength and significance slightly vary for some variables. Speaking mostly English at home and having health insurance coverage (either public, private or both) are the strongest and most significant predictors for all outcomes. Specifically, all models reveal that individuals who mostly speak English home and that have any type of health insurance are less likely to cross to Mexico for health care, compared to those who mostly speak Spanish and who do not have health insurance coverage. It is only in the pharmaceutical services model where the coefficients for the insurance variables have lower significance and strength. Length of residence is also negatively associated with all cross-border outcomes. This reveals that the longer a person has lived in Webb County, the less likely he or she is of seeking Mexican health care services; however, the power of the coefficients is somewhat weak. Having only a high school diploma has a positive effect across all outcomes. There is one exception to these consistent findings: households with children ages 6 to 18 are more likely to seek medical and at least one type of service, but not dental or pharmaceutical.

The -2 log likelihood (-2LL) and Nagelkerke R^2 provide insight as to the fit of the models. The -2LL serves as a guide regarding how much unexplained information there is after the variables have been included in the model; thus, the larger the number, the more unexplained variability there is (Field 2009). Based on this, as Table 6 illustrates, use of Mexican medical services has the best fitting model.

Table 6. Comparison of the Final Logistic Regression Models for the Four Dependent Variables

Predictors	Medical	Dental	Pharmacy	At least One
Personal factors				
Age	-.005	.002	.000	-.002
	(.011)	(.010)	(.010)	(.010)
Male	-.059	-.457	-.320	-.077
	(.248)	(.240)	(.236)	(.234)
Married	-.117	-.408	-.095	-.303
	(.260)	(.246)	(.245)	(.243)
Children ages 0 to 5	-.094	.139	.408	.081
	(.262)	(.252)	(.246)	(.248)
Children ages 6 to 18	.757**	.300	.370	.511*
	(.252)	(.238)	(.236)	(.231)
Only high school diploma	1.009**	.910**	.829**	.951**
	(.321)	(.309)	(.304)	(.313)
Some college education	.330	.299	.545	-.051
	(.387)	(.374)	(.366)	(.357)
College degree or more	.517	-.056	.707	-.004
	(.496)	(.463)	(.457)	(.443)
Economic factors				
Household Income	-.006	.005	-.001	.001
	(.007)	(.007)	(.007)	(.007)
Home ownership	-.141	-.115	-.153	-.029
	(.259)	(.249)	(.247)	(.248)
Vehicle ownership	-.144	.051	.275	.011
	(.438)	(.431)	(.433)	(.421)
Insurance Coverage				
Public insurance	-1.757***	-1.146***	-.740**	-1.187***
	(.306)	(.285)	(.281)	(.296)
Private insurance	-1.628***	-.925**	-.818*	-1.296***
	(.396)	(.373)	(.375)	(.382)
Public & private insurance	-2.130***	-1.707***	-1.045*	-1.638***
	(.531)	(.533)	(.489)	(.484)
Cultural factors				
English	-1.261***	-1.220***	-1.701***	-1.307***
	(.353)	(.343)	(.364)	(.320)
Bilingual	-.121	-.086	-.064	-.052
	(.328)	(.314)	(.303)	(.318)
Length of residence	-.034***	-.023*	-.020*	-.025**
	(.010)	(.009)	(.009)	(.009)
Intercept	1.678*	.578	-.092	1.467*
	(.682)	(.648)	(.648)	(.643)
-2 Log likelihood	468.066	470.006	476.125	486.595
Nagelkerke R square	.372	.240	.234	.315

Note: N=555. Standard errors in parentheses. *$p < .05$; ** $p < .01$; *** $p < .001$

With regards to the Nagelkerke R^2, Field (2009) warns that the value of R in logistic regressions should be treated with caution given that it is not an accurate measure as it is, for example, in linear regressions. However, it does provide an estimate of the substantive significance of the model (Field 2009). A comparison of the Nagelkerke R^2 across outcomes reveals that the use of medical services is the outcome best explained by the model given that it is explaining 37% of the variance. The model also adequately explains the rest of the outcomes, as illustrated by their R squares: dental, 24%; pharmaceutical, 23%; and, any service, 32%.

In short, the statistical analysis reveals that the strongest predictors of cross-border use of Mexican health care services are affordability (specifically health insurance coverage) and familiarity. Interestingly, none of the demographic factors included in the analysis (i.e., age, gender, marital status) are associated with Mexican health care utilization among Hispanic U.S. residents. Other variables that did not have effects on any of the outcomes were: home ownership, vehicle ownership and speaking English and Spanish equally at home.

DISCUSSION

The present study was guided by three research questions: (1) What are the characteristics of Hispanic border residents that cross to Mexico for health care? (2) Are those characteristics consistent for all types of health care services sought in Mexico? (3) What personal, affordability, and familiarity factors predict cross-border use of Mexican health services? First, this study finds that almost half of the participants in the survey seek at least one type of health care service across the border. When broken down by type of service, over one-third utilizes medical (36%), dental (32%), and pharmaceutical (34%) services in Mexico.

Results suggest that having a high school diploma as the highest level of education and having children ages 6 to 18 living in the household significantly increase the odds of seeking services in Mexico. On the other hand, having any type of insurance (public, private or both), living in an English-dominant household, and having a longer length of residence in Webb County significantly decrease the likelihood of crossing the border for health purposes. These predictors were consistent for all types of services, with the only exception being the children variable which was only significant for the use of medical services and at least one health care service. In short, border residents who seek care in Mexico have the possibility of accessing affordable services in a culturally and linguistically familiar setting (Glinos et al. 2010).

Need to Increase Health Insurance Coverage

The present study reveals that lack of health insurance coverage is, without a doubt, the strongest factor influencing Hispanic border residents' decision to seek care in Mexico. This finding, coupled with the lack of significance of household income, reveals that cross-border patient mobility is not a matter of having financial barriers, but a matter of not having access to the health care system. These results contradict with Laugesen and Vargas-Bustamante (2010) who argue that cross-border health utilization is influenced by low income and that this practice decreases as income increases. Insurance coverage's negative effects on are consistent with research suggesting that having health insurance decreases cross-border patient mobility (Bastida et al. 2008; Landeck and Garza 2002; Su et al. 2011; Vargas Bustamante et al. 2008; Wallace et al. 2009). In addition, these findings contribute to the literature by confirming that, regardless if the coverage is public or private, as long as a person has some type of health insurance, he or she is less likely to cross to Mexico for health purposes.

Lack of health insurance is usually explained through the individual attributes of the uninsured (i.e., poor, ethnic minorities, and/or unskilled workers). For example, a report by the U.S. Department of Health and Human Services (2007) provided a general profile of the 47 million uninsured individuals in the country: family incomes below $25,000, young adults, Hispanic, unemployed, or unskilled workers. However, such profiles ignore contextual factors that explain important regional variations. When focusing on the U.S.-Mexico border, individual attributes are intensified by ecological factors inherent to this region (Bastida et al. 2008; Landeck and Garza 2002) – for example, the binational economy, high poverty levels, low wage structure, and confluence of two different national health care systems.

Hispanics have the highest uninsurance rates out of all racial/ethnic groups in the United States (Office of Minority Health 2009); hence, they also obtain half as much medical care and physician services than those with insurance (Parietti, Ferreira-Pinto, and Byrd 1998). By not having health insurance, individuals are forced to pay out of pocket for medical services and medications. In a report for the World Health Organization, Xu (2005) argued that out of pocket health care expenses can push households into catastrophic expenditures that can lead to cutting down spending on basic necessities or even poverty. Thus, for border residents, Mexico has been a viable and feasible alternative to receive the health care services they might otherwise be unable to afford. Mexican doctors, pharmacies and hospitals are well aware of this and aggressively market their services to U.S. border residents. For example, many pharmacies and dentists are conveniently located near the border, just a across from Mexican customs.

With the health care system increasingly becoming more expensive[9], efforts to expand insurance coverage should take top priority in order to make it more accessible and affordable to a greater proportion of the population. This is especially important given the high rates of

[9] It is estimated that health care price inflation reached a high of 60% between 2001 and 2005 (Bastida et al. 2008).

uninsurance in the country and particularly in border communities. In this context, several scholars and policy-makers have suggested the establishment of a binational health insurance (González Block and de la Sierra-de la Vega 2011; Wallace et al. 2009). California has already set the example. Since 2000, insurance companies in California have been allowed to sell cross-border health insurance plans, allowing customers to access networks of private Mexican physicians and hospitals[10]. This not only benefits the Hispanic population who has the opportunity to access more affordable and culturally appropriate services, but it also alleviates pressure on the U.S. health care system. However, these services are offered through private insurance plans accessed only through employment. In order for this strategy to truly increase the insurance coverage of border residents, mechanisms should be created to make it accessible to a broader segment of the population; for example, by using public instead of private providers in Mexico and subsidizing it (Vargas Bustamante et al. 2008; Wallace et al. 2009). In addition, bi-national governmental and provider collaboration would be needed to establish common quality standards and reimbursement policies (Laugesen and Vargas Bustamante 2010).

The Importance of Cultural Competency in Health Insurance

Health care disparities among racial/ethnic groups are only partially explained by lack of access to health care. Disparities develop within a broader social, cultural, and economic context framed by structural inequalities (Bruhn 1997; Johnson et al. 2004). The sociocultural characteristics and needs of minority populations influence how they interact with the health care

[10] Through the amendment of California's Knox-Keene Health Care Service Plan Act of 1975 and two Senate bills permitting the sale of Mexican health insurance plans in California, employers are allowed to offer binational health insurance plans to their employees. Such plans allow covered employees to use health care services wherever they prefer. Services in Mexico are provided by a network of contracted private doctors and hospitals in border cities of Baja California. The Mexican providers covered by binational health insurance plans must comply with quality and regulatory standards established by California health authorities in addition to the Mexican regulations. As of 2007, three U.S. health insurance companies and one Mexican company were licensed to offer these services to California employers (Glinos et al. 2010; Vargas Bustamante et al. 2008; Wallace et al. 2009). See Knox-Keene Health Care Service Plan Act of 1975, § 1351.2 (http://wpso.dmhc.ca.gov/regulations/12kkap/12kkap.pdf)

system, seek and receive health care, and adapt to the barriers they face (Hicks 1990; Pincus et al. 1998). Therefore, a strategy solely focused on access to care disregards a crucial element: "the patient himself or herself in a sociocultural context" (Pincus et al. 1998: 409).

Although lack of health insurance is a strong predictor of cross-border patient mobility, cultural factors also have an important influence on this practice. The significance of language and acculturation variables in the present study reveals the importance of considering cultural factors in all Hispanic health policies. This is due to the fact that Hispanics are highly responsive to the linguistic and cultural adequacy of health care services. With regards to language, there were statistically significant differences in the odds of seeking care in Mexico between respondents living in Spanish and English-dominant households. Being bilingual, which should be an advantage in negotiating both cultures and health systems, was not a significant predictor.

In general, English speakers are significantly less likely than Spanish speakers to seek any type of health service in Mexico. This influence was strongest for the purchase of medications, a finding that was consistent with Su et al.'s (2011) study of 32 Texas border communities. The negative influence of speaking mostly English is not unexpected as it might be difficult for English speakers to communicate with Mexican health providers and/or they might not be familiar or comfortable with the culture.

It could be assumed that Spanish speakers should not have a problem communicating with health providers on the U.S. side of the border given that most doctors and their staff are bilingual. A quick search in the online referral service *Direct Doctor Plus* (http://www.directdoctorsplus.com/) revealed that, out 164 physicians affiliated to Doctors Hospital in Laredo, Texas, 78 speak Spanish (48%). A possible explanation to the influence of Spanish on cross-border use of health care services could be that, while there might be ethnic and

linguistic concordance between patients and physicians, there might not be cultural concordance. That is, the cultural orientation of the health care system might not be compatible with the cultural perspectives or needs of some patients (Johnson et al. 2004). For instance, a study of bias and cultural competence in health care discovered that cultural differences exist between Black patients and White physicians (Johnson et al. 2004). In some cases, such differences negatively impact Black patients' experiences with providers and with the health care system in general. A similar phenomenon could be occurring at the border wherein the problem might not necessarily be an issue of language *per se*, but of physician-patient interaction. Although they could both be Spanish-speakers, they might not share the same values or lived experiences (Brown et al. 2007).

The geographic and cultural proximity of Mexico to the U.S. makes it easy for Hispanic border residents to be treated in a familiar setting by providers who not only speak their language but also share their culture (Glinos et al. 2010; Laugesen and Vargas-Bustamante 2010; Wallace et al. 2009). This is particularly important for recent immigrants as evidenced the statistical significance of length of residence in this study. Less acculturated Hispanics with a shorter length of residence may prefer being treated in Mexico due to familiarity with the health care system (i.e., knowledge about how to navigate the system) and trust of providers. On the other hand, the fact that a longer length of residence significantly decreases the likelihood of crossing to Mexico for health care could indicate that this practice diminishes as Mexican Americans assimilate into mainstream American society by adopting the English language, lifestyle, attitudes, and behaviors, or by the strengthening of ties in the U.S. (Fernández and Amastae 2006; Wallace et al. 2009). In addition, weakening social ties in Mexico might also discourage crossing to Mexico for health care. However, while significant, the coefficients for this variable

were somewhat weak, therefore, the impact of acculturation should be further analyzed in future research.

Conclusions and Policy Recommendations

Mexico has traditionally been an alternative for U.S. border residents to seek and receive the health services that they need. The fact that 48% of respondents use at least one type of health care service across the border suggests that: (a) there are barriers that hinder access to health care at the border, and (b) Mexico serves as an important alternative source of health care for many Hispanic border residents. Seid et al. (2003) argue that U.S. residents who cross to Mexico for their health needs "vote with their feet, they vote with their wallets, paying out of pocket for health care, even when insured in United States" (p. 128). However, little attention has been paid to this practice by U.S. health authorities.

The health behaviors of the disadvantaged are not only shaped by the socioeconomic or cultural characteristics of individuals, but also by the adequacy – or inadequacy – of the health care system in the delivery of services (Bruhn 1997; Dutton 1978). The foundation of health care systems is that health care should be "organized, delivered, consumed, and financed within the boundaries of a single territory" (Glinos et al. 2010:1145). However, almost half of the respondents in the present study reported to seeking at least one type of health care service in Mexico, thus, deliberately moving outside their country of residence to receive care.

Policy reforms are crucial to solve the social, structural and institutional barriers in the domestic access and provision of health care which make people look for care outside of the country. People should be able to access and navigate the health care system easily and with minimal barriers. Due to the way the U.S. health care system is structured, this would mean expanding health insurance coverage in the country.

Additionally, efforts must be made to recruit and retain physicians, dentists, and other health care providers to the medically underserved border region (Landeck and Garza 2002). Such efforts should also focus on increasing the number of health care professionals from this region who have a greater understanding of the local culture, health beliefs, and practices. Steps have been taken in this area, for example, by the Mid-Rio Grande Border Area Health Education Center, which seeks to increase the number of health care workers in Laredo, Texas and the surrounding area (www.mrgbahec.org); however, more funding is needed to support and grow programs such as this. In all, results from this study indicate that it is crucial to formulate effective health policies to address health disparities, the gap in the access to health care and health preferences of the Hispanic population in the border region. Having access to adequate health services can effectively promote the correct use of the health care system, advance preventive care initiatives, and, as a result, increase the quality of life and health outcomes of the population (BCH 2010a; Vargas Bustamante et al. 2008).

Limitations and Future Research

The present study was limited by the information available in the Community Household Survey. This assessment did not include sociocultural information that could provide insight into the decision to cross for health care. This study also lacked data recording the persons' subjective experiences using services across the border such as patient-doctor interactions. Methodologically, the sampling was done using stratification and clustering techniques, but the binary logistic regression analyses did not account for the effect of the sampling design and, instead, assumed a super population case.

Future studies should take into consideration elements such as the respondents' immigration status and social capital across the border, whether they had a regular provider in

Mexico, the type of medical care sought (e.g., primary care, inpatient care), the frequency of cross-border health care use, and their thoughts of U.S. health care versus Mexican health care services. It might also be valuable to examine how the shortage of health professionals at the border impacts the decision to seek care in Mexico. In addition, future studies should analyze how border residents are adapting their health behaviors due to the increasing violence in Mexico and the new cross-border requirements for U.S. citizens imposed by the Department of Homeland Security.

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