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Predictors of Routine Medical Care Use among Mexican Immigrants/Mexican-Americans Varying in Legal Status

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Abstract. Background: Immigration has been the focus of intense political debate, with a recurrent theme being the use of public services, including healthcare. Although Latinos are the largest and fastest growing ethnic group in the United States (U.S.), evidence suggests they underutilize healthcare, with Mexican Immigrants and Mexican Americans (MI-MA) living on the U.S.-Mexico border exhibiting the greatest disparities. **Objective:** This study explored the association of predisposing, enabling and need characteristics, including legal status, with the use of routine medical care (RMC) among 387 MI-MA living on the California-Mexico border. **Methods:** This cross-sectional study used data collected in 2009 for the San Diego Prevention Research Center (SDPRC) community survey; data analyses were completed in Summer 2012. This study involved multistage sampling and recruitment of Latino adults in 200 census blocks near the California-Mexico border to complete an interview and height and weight measurements. Sequential logistic regressions assessed the relative contribution of predisposing, enabling and need factors to the use of RMC. **Results:** Predisposing and enabling factors (gender, undocumented status, cost) distinguished between respondents with *recent* (<1 year) versus *limited* (≥ 5 years including never) use of RMC, whereas enabling and need factors (insurance, dispositional trust, presence of a chronic illness) adequately differentiated between those with *recent* versus *delayed* (≥ 1 year, but <5 years) use. Undocumented status distinguished between those with *delayed* versus *limited* use of RMC. **Conclusions:** Consideration of different factors, including financial difficulties and legal status, is necessary for promoting use of RMC among MI-MA living in this border region.

Keywords: Healthcare access, U.S.-Mexico border, Hispanic, Minority, Utilization.

1. Introduction

A significant proportion of United States (U.S.) Latinos (54%) reside in U.S.-Mexico border-states, with Mexican Immigrants and Mexican Americans (MI-MA) being the largest subgroup (PHC, 2011). When compared to other border-states, California has the largest MI-MA population and largest percentage of non-citizen residents. Of the foreign-born

MI in California, only 825,000 are naturalized citizens and nearly 3 million are non-citizens, with a large proportion living on or near the U.S.-Mexico border (CMHI, 2010; USMBCC, 2010). If current trends remain unchanged, populations in this region will continue growing at a faster rate than the population as a whole in both the U.S. and Mexico (USMBCC, 2010).

Immigration has been the recent focus of intense

political debate, with a recurrent theme being the use of public services, including healthcare (Galarnau, 2011). Although Latinos are the largest and fastest growing ethnic group in the U.S., they underutilize healthcare, with MI-MA living on the U.S.-Mexico border experiencing greatest disparities (USMBCC, 2010, Vargas-Bustamante *et al.*, 2009, Wallace, Gutierrez and Brown, 2003). Widespread poverty, unemployment, low educational attainment, high uninsurance rates, a large undocumented population, inadequate public healthcare infrastructure, and a shortage of healthcare providers, are all factors limiting access to healthcare services along the US-Mexico border (USMBCC 2010).

With the continued rise of healthcare costs, the U.S. Department of and Human Services has emphasized the use of prevention healthcare services among the vulnerable, particularly those with restricted access (HHS, 2003). Access to prevention healthcare services in the U.S.-Mexico border may be particularly important given the high prevalence of preventable diseases among MI-MA in this area (USMBCC, 2010). Rates for numerous infectious diseases and chronic health conditions including tuberculosis, diabetes, heart disease, obesity, and cervical cancer, are higher among Latinos (including MI-MA) in the U.S.-Mexico border when compared to Latinos on other U.S. areas (Anders, 2013, USMBCC, 2010). Increasing the use of preventive medical services (e.g., routine check-ups, health screens, immunizations) for MI-MA in this area may be important to facilitate early detection and treatment, which in turn may reduce morbidity and mortality rates, as well as healthcare spending (USMBCC, 2010).

New contribution. Research on the use of routine medical exams on the US-Mexico border among MI-MA varying in legal status is limited. Although the literature has addressed citizenship and authorized status as important determinants (Vargas-Bustamante *et al.*, 2009; Vargas-Bustamante *et al.*, 2010), this study is the first to explore the use of routine medical care (RMC) in this border population. Given existing disparities in the use of healthcare services along the U.S.-Mexico border (USMBCC, 2010), the purpose of this study was to explore the association of specific factors (including legal status) and RMC use to better understand patterns of use among MI-MA in this border region.

Conceptual model. The conceptual model utilized was a version of the Anderson model adapted for studying the homeless population called the Behavioral Model for Vulnerable Populations (Gelberg, Andersen and Leake, 2000). Since part of the population in this study is transient, this adapted version of Anderson's model was relevant (Parchman and Byrd, 2001). This model emphasizes three overlapping domains likely to influence healthcare service use: *predisposing* (demographic and social structure characteristics including legal status); *enabling* (factors that facilitate/impede healthcare service use), and *need*, (health status characteristics).

2. Methods

Design and sample. This cross-sectional study used data collected in 2009 for the San Diego Prevention Research Center

(SDPRC) biannual community survey, which assessed various aspects of quality of life and health behaviors of Latinos living on the U.S.-Mexico border. Multistage sampling methods were used to select participants. Two hundred census blocks from four high-density Latino communities were randomly selected. From these, 4,123 households were selected at random. To be eligible for participation, the household should have had at least one self-identified Latino adult (age ≥ 18) who lived in the house at least 4 or more days per week. Only one adult was interviewed per household. Nearly 42% of households were eligible, 27% were ineligible (no Latinos living in the household), and 31% were visited but of unknown eligibility (no access). The cooperation rate was 23%. Comparisons using neighborhood characteristics showed participating households were located in neighborhoods that on average, had a lower percentage of home ownership (27.5%) compared to neighborhoods in which households refused participation (31.7%; $p \leq 0.005$).

A total of 397 Latino adults completed the survey, including 392 participants who self-identified as MI-MA. Of these, five were missing data on the outcome of interest (use of RMC) and/or reported immigration legal status; thus, they were excluded from analyses. Results are based on the remaining 387 MI-MA.

Data collection. Trained bilingual, bicultural research assistants conducted a single home visit for eligibility assessment and a face-to-face interview. Participants could complete the survey in English or Spanish. When available, valid translated versions of measures were used. For non-translated measures, a certified translator was used. As a final step to validation, the entire survey was reviewed and approved by a native Spanish speaker member of the research team. No compensation was provided for participation, and the study was approved by SDSU-UCSD Institutional Review Boards.

3. Measures

Dependent Variable. RMC use was assessed using the question "About how long has it been since you last visited a doctor for a routine checkup [*examen de rutina*]? A routine checkup is a general physical exam [*examen general de salud*], not an exam for a specific injury, illness, or condition." This question was modeled after the 2008 Behavioral Risk Factor Surveillance Survey (BRFSS) (CDC 2009), and it has been previously used as outcome variable to assess RMC use (Parchman and Byrd, 2001). Based on the distribution of data, responses were collapsed into three categories denoting recency in RMC use: "*recent*" (<1 year), "*delayed*" (≥ 1 year, but < 5 years), and "*limited*" (≥ 5 years including never). Despite limited guidelines available, it has been suggested that annual RMC is useful to identify asymptomatic diseases early, obtain immunizations, and improve patient-physician relationships (Merenstein, Daumit and Powe, 2006). Hence, "*recent use*" was used as the referent category.

Predisposing factors. These included demographics (age, gender), social structure variables (marital status, education, household size) and immigration characteristics (years in U.S., acculturation, legal status). Demographic questions

were modeled after the 2008 BRFSS and the U.S Census Bureau (CDC, 2009; USCB, 2009). Acculturation was assessed using the Bidimensional Acculturation Scale for Hispanics (BAS), which is a 12-item measure that produces two scores: Hispanic and Anglo domain (Marin and Gamba, 1996). In this study, only the Anglo domain was used (continuous score ranging from 1-4), with higher scores denoting higher acculturation to the English language. The BAS has good psychometric properties, and works well with MI-MA (Marin and Gamba, 1996). Legal status was assessed using questions from the 2007 Boston Metropolitan Immigrant Health & Legal Status Survey (BM-IHLSS). Three legal status categories were created (U.S. citizens, legal residents, and undocumented/temporary residents) (Marcelli, Holmes and Estrella 2009). Given the small sample size and consistent with previous studies, temporary residents ($n=17$) were combined with the undocumented ($n=61$) (Ortega *et al.*, 2007). Temporary residents were similar in important demographic characteristics (age, gender, employment, insurance status, poverty level, marital status, and acculturation) when compared to the undocumented. Nevertheless, any bias that the temporary residents may have introduced to the undocumented category was expected to be positive resulting in more conservative comparisons (Ortega *et al.*, 2007).

Enabling factors. These were assessed using economic factors (poverty level, employment, insurance status, and cost as a barrier to healthcare service use), as well as residence stability (years at current residence), social network, dispositional trust (*confianza*), and perceived discrimination. Social network was assessed using two continuous variables from the Social Network Scale of the 2007 BM-IHLSS (Marcelli, Holmes and Estrella, 2009). The first denoted size of a respondent's immediate social network (up to 5 people), and the second measured instrumental social support. This, encompassed the concrete ways that people assist each other (e.g., number of times a person has helped you with transportation, family, financial, health, housing or some other problems during the past 12 months?). This scale has been previously used with Latinos (Marcelli, Holmes and Estrella, 2009). Trust or *confianza* was assessed using the Trust Subscale of the Social Capital Assessment Tool (Subramanian, Kim and Kawachi 2002). This 7-item scale assesses how much an individual trusts a variety of groups that he/she interacts with. Responses ranged from 4=a lot to 1=not at all, and this scale has been previously used with Latinos (Marcelli, Holmes and Estrella, 2009). Perceived discrimination was assessed using a dichotomous variable (Yes/No) based on responses to the question "within the past 30 days, have you felt emotionally upset, for example angry, sad, or frustrated, as a result of how you were treated based on your race?" (CDC, 2009).

Need factors. These were assessed using self-reported presence of a chronic illness (Yes/No), mental health status, and having crossed the border for medical reasons within the past month (Yes/No). Mental health status was assessed using the Patient Health Questionnaire-9 (PHQ-9) (Kroenke, Spitzer and Williams, 2001). This 9-item scale

uses a continuous score (range 1 to 27) to assess for symptoms of depression (1-4=minimal; 5-9=mild; 10-14=moderate; 15-19=moderately severe; 20-27=severe), and it is valid for use with Latinos (Merz *et al.*, 2011).

Proposed Statistical Analyses. Analyses were conducted using SPSS, Version 19.0. Descriptive statistics were generated for all study variables. Bivariate associations were examined between study variables and RMC use. For parsimony, only variables significantly associated ($p \leq .05$) with the outcome of interest in bivariate analyses were included in multivariate models. Three multivariate logistic regressions were performed to determine the independent association between predisposing, enabling and need variables and RMC use. The first model tested the relevance of the aforementioned factors to *recent* versus *limited* RMC use, the second compared *recent* versus *delayed* use, and the third compared *delayed* versus *limited* use. In all models, sequential analyses were used to assess the relative contribution of predisposing (step 1), enabling (step 2), and need (step 3) characteristics to RMC use.

4. Results

Sample characteristics. Descriptive statistics are presented in Table 1. The sample was predominantly female with an age range of 18 to 89 years. The mean age was 44 years ($SD=16.9$). More than half had less than a high school education and were unemployed, and almost half lived in poverty. Fewer than half were uninsured, roughly a quarter noted that cost limited their healthcare service use in the past year, and more than a third reported having crossed the border to Mexico to seek medical services/medications within the past year. Most participants answered the survey in Spanish (89%) and were moderately acculturated based on language use. No significant differences in RMC use were observed between respondents who answered the survey in English versus Spanish ($p = .11$). Half of the participants were citizens (US born or naturalized), with the rest being permanent legal residents (31%) or undocumented/temporary residents (19%). Nearly half reported having a chronic health condition, but on average minimal symptoms of depression were reported ($M=4.3$, $SD=4.7$). Two-thirds reported having *recent* RMC use, 21% reported *delayed* use and 12% reported *limited* use. Undocumented immigrants reported the least use of *recent* RMC, with citizens reporting the most *recent* use. Undocumented immigrants reported the most *limited* use of RMC.

Characteristics associated with RMC use. Results of multivariate analyses comparing *recent* versus *limited* use, and *recent* versus *delayed* use are presented in Tables 2 and 3 respectively. For parsimony, results from analysis comparing *delayed* versus *limited* use are not included in a table, but discussed in the results. All models exceeded the minimum number of cases needed for unbiased estimates (Vittinghoff and McCulloch, 2007).

Table 1. Predisposing, enabling and need characteristics associated with RMC use.

	Total N=387	Recent RMC¹ 66.9% (n=259)	Delayed RMC² 21.2% (n=82)	Limited RMC³ 11.9% (n=46)
Predisposing Factors				
Mean age (SD) ^{***}	43.6 (16.9)	46.2 (17.3)	39.9 (15.9)	35.5 (11.9)
% Females [*]	73.1	76.1	72.0	58.7
% High school or more	46.3	45.9	53.7	34.8
% Married	60.4	59.0	61.0	67.4
Mean household size (SD) ^{**}	3.7 (1.6)	3.5 (1.6)	3.7 (1.6)	4.3 (1.6)
Mean BAS score ⁴ (SD)	2.5 (0.9)	2.5 (0.9)	2.4 (0.7)	2.5 (0.8)
Mean yrs in US (SD) ^{***}	20.7 (13.4)	23.0 (13.7)	17.4 (12.2)	14.7 (11.4)
Legal status ^{***}				
% Citizens	50.1	56.4	41.5	30.4
% Legal residents	30.5	29.7	37.8	21.7
% Undocumented	19.4	13.9	20.7	47.8
Enabling Factors				
% Above poverty level	44.8	42.4	57.1	38.2
% Employed last week	46.3	46.3	48.8	41.3
% Insured ^{***}	58.3	69.4	36.6	34.8
% Cost as barrier [*]	21.4	17.8	25.6	34.8
Residence Stability (SD)	8.2 (8.8)	8.5 (8.8)	7.5 (8.9)	8.1 (8.1)
Mean size of social network (SD)	3.6 (1.3)	3.6 (1.3)	3.6 (1.2)	3.4 (1.3)
Mean instrumental social support (SD)	212.2 (306.2)	219.4 (336.7)	183.7 (245.9)	221.8 (206.1)
Mean trust (SD) ^{**}	2.9 (0.6)	2.8 (0.6)	3.1 (0.5)	2.9 (0.5)
% Perceive discrimination	18.2	17.1	21.0	19.6
Need Factors				
% Presence of chronic health condition ^{***}	49.0	57.0	31.7	34.8
Mean PHQ-9 score (SD)	4.3 (4.7)	4.4 (4.8)	3.7 (4.1)	5.3 (4.9)
% Crossed border for medical reasons within past month	35.9	35.3	28.9	58.8

¹Recent RMC = Use of routine medical care < 1 year ago.

²Delayed RMC = Use of routine medical care ≥ 1 year ago, but < 5 years.

³Limited RMC = Never used routine medical care or used it ≥ 5 years ago.

⁴Mean BAS score = Mean acculturation score as measured by the Anglo domain of the Bidirectional Acculturation Scale for Hispanics (BAS) (21)

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 2. Sequential logistic regression to differentiate recent (< 1 year ago=0) versus limited (never or ≥ 5 years ago=1) use of RMC.

	Variance	Model 1		Model 2		Model 3	
		OR	CI	OR	CI	OR	CI
Model 1: Predisposing factors	21.4%						
Age		0.99	0.96, 1.03	0.99	0.95, 1.03	0.99	0.95, 1.03
Gender (Fem)		2.05	0.87, 4.83	3.77	1.38, 10.26**	3.76	1.38, 10.24**
Household size		1.20	0.92, 1.57	1.13	0.85, 1.49	1.12	0.85, 1.49
Yrs in US		0.98	0.94, 1.03	0.99	0.94, 1.04	0.99	0.94, 1.04
Legal status ^a							
Legal residents		1.95	0.56, 6.85	1.85	0.50, 6.81	1.84	0.50, 6.79
Undocumented		5.66	1.56, 20.58**	4.41	1.14, 17.02*	4.30	1.09, 17.03*
Model 2: Enabling factors	30.2%						
Insurance (Yes)				2.37	0.94, 5.99	2.34	0.91, 5.98
Cost (No)				3.05	1.15, 8.12*	3.09	1.15, 8.31*
Trust				1.79	0.80, 4.02	1.79	0.80, 4.02
Model 3: Need factor	30.2%						
Chronic health condition (No)						0.91	0.33, 2.52

^a Reference category: Citizens. **p* < .05; ***p* < .01; ****p* < .001

Table 3. Sequential logistic regression to differentiate *recent* (< 1 year ago=0) versus *delayed* (≥ 1 year, but < 5 years =1) use of RMC.

	Variance	Model 1		Model 2		Model 3	
		OR	CI	OR	CI	OR	CI
Model 1: Predisposing factors	5.8%						
Age		0.99	0.96, 1.01	0.98	0.96, 1.01	1.00	0.97, 1.03
Gender (Fem)		1.58	0.82, 3.05	2.56	1.23, 5.32**	2.71	1.28, 5.73**
Household size		0.98	0.80, 1.21	0.97	0.78, 1.21	0.93	0.75, 1.16
Yrs in US		0.98	0.95, 1.01	0.98	0.95, 1.02	0.98	0.95, 1.04
Legal status ^a							
Legal Residents		1.26	0.62, 2.57	1.07	0.51, 2.26	1.12	0.52, 2.39
Undocumented		1.04	0.43, 2.50	0.72	0.28, 1.84	0.61	0.24, 1.59
Model 2: Enabling factors	17.2%						
Insurance (Yes)				2.53	1.28, 4.98**	2.15	1.07, 4.30*
Cost (No)				1.93	0.93, 3.97	2.23	1.05, 4.72*
Trust				2.22	1.22, 4.03**	2.39	1.29, 4.23**
Model 3: Need factor	21.3%						
Chronic health condition (No)						2.82	1.34, 5.97**

^a Reference category: Citizens. **p* < .05; ***p* < .01; ****p* < .001

In the model comparing *recent* versus *limited* RMC use, the model with the predisposing factors was statistically significant, χ^2 (6, $N=211 = 28.37$, $p < .001$), and accounted for 21.4% of the variance. After adding enabling characteristics, the model remained statistically significant accounting for 30.2% of the variance. The addition of need characteristics did not improve model fit. In the full model, being a man, having undocumented legal status versus citizenship, and having experienced cost as a barrier to the use of healthcare services were significantly associated with *limited* use of RMC when compared to *recent* use, after controlling for relevant covariates.

In the model comparing *recent* versus *delayed* RMC use, the model with only predisposing factors was not significant, χ^2 (6, $N=241 = 9.85$, $p = .131$), and accounted for little variance (5.8%). In the full model, the addition of enabling and need characteristics significantly improved model fit and increased the explained variance (21.3%). Being a man, being uninsured, having experienced cost as a barrier to the use of healthcare services, reporting more trust, and not having a chronic illness were significantly associated with *delayed* use of RMC when compared to *recent* use, after controlling for relevant covariates.

In the model comparing *delayed* versus *limited* RMC use, the model with predisposing factors was statistically significant, χ^2 (6, $N=98 = 14.01$, $p = .03$), and accounted for 18.5% of the variance. In the full model, the subsequent addition of enabling and need factors increased the explained variance (23.6%). Being undocumented when compared to having citizenship was significantly associated with *limited* use of RMC when compared to *delayed* use. Specifically, those reporting undocumented status were 8.94 times more likely to report *limited* versus *delayed* use of RMC after controlling for relevant covariates (95% CI=1.70, 47.07, $p = .01$).

5. Discussion

This study identified factors, including immigration legal status, associated with the use of RMC among MI-MA on the California-Mexico border. When compared to national estimates for MI-MA in the U.S., participants in this study differed on several factors likely to influence the use of preventive healthcare services, including this sample being older, having lower educational attainment, higher unemployment and a higher percentage living in poverty (Motel and Patten 2012). This suggests that MI-MA living in this border region may face a significant number of barriers, which may preclude use of RMC in this community. Noteworthy is that this sample is predominately female; thus, the identified patterns of utilization mostly pertain to MI-MA women in this region.

No studies with similar populations have assessed the use of RMC in a manner comparable to this study; thus, direct comparison of estimates was not possible. Nevertheless, when comparing healthcare service use by immigration legal status, this study showed patterns consistent with previous studies (Fuentes-Afflick and Hessol, 2009). Specifically, citizens were more likely to report *recent* use of RMC, with the undocumented having the lowest utilization. Noteworthy is

that in additional sensitivity analyses, naturalized citizens were more likely than U.S. born citizens to report *recent* use (data not shown). Although factors other than naturalization likely influence the use of preventive healthcare services, it is possible that legalization could facilitate access to resources (e.g., insurance) and development of skills (e.g., English proficiency) likely to increase access to preventive healthcare use. Longitudinal studies are needed to explore how changes in immigration legal status may influence access to resources and skills that facilitate the use of preventive healthcare services.

Important predictors of the use of RMC were identified in this study. Consistent with previous studies, being undocumented was associated with *limited* use of RMC, even after controlling for economic factors and insurance (Berk *et al.*, 2000). Previous studies have shown fear of deportation and limited English proficiency as barriers to the use of healthcare services among the undocumented (Berk *et al.*, 2000; Berk and Schur, 2001). This concern may be prevalent given current ambivalence and uncertainty on immigration policies (Galarneau, 2011). Noteworthy in this study is that undocumented status was relevant for distinguishing between those with *recent* versus *limited* RMC use, but not in differentiating between those with *recent* versus *delayed* use. This could suggest that once undocumented immigrants identify a source of care that is accessible and where they feel safe, immigration legal status may no longer impede the use of preventive services, but instead uninsurance and financial limitations may present greater barriers. This emphasizes the importance to continue providing support and funding to safety net providers, such as federally qualified healthcare centers, which provide accessible and affordable healthcare to marginalized immigrants (including the undocumented), who otherwise delay care until emergency services are necessary. Facilitating access to affordable and safe preventive healthcare through safety net providers, health fairs, and programs led by Community Health Workers (CHW), may be a viable way to prevent, identify and treat disease early among marginalized immigrants, which in turn may reduce the use of emergency care and related costs (D-Emilia and Suplee, 2012).

Previous studies with MI-MA have found insurance and cost to be strong predictors of preventive healthcare service use (Vargas-Bustamante *et al.*, 2010; Parchman and Byrd, 2001; Leybas-Amedia, Nuno and Garcia, 2005). This study supports these findings. Differences in insurance status across MI-MA varying in immigration legal status may contribute to even greater within group disparities that may preclude the use of preventive healthcare services. Bivariate analysis in this study showed significant differences existed in insurance coverage by immigration legal status, with citizens more likely to be insured (70%) when compared to legal residents (58%) and the undocumented (25%). Chronic uninsurance is common and more prevalent among MI-MA when compared to other Latino subgroups (Vargas-Bustamante, Hai-Gang and Ortega, 2009), and socio-economic factors, including economic disadvantage and transient lifestyles, provide the most common explanation for the disparity (Goldman, Smith and Sood, 2005). The Patient Protection and Affordable Care

Act (ACA) (HHS, 2012), signed into law in 2010, is intended to expand access to health insurance coverage for the poor and uninsured in the US. Yet, the ACA specifically excludes undocumented immigrants from obtaining access to health insurance, even if they are willing to pay for their own health policy. It is estimated that after full implementation of the ACA, undocumented immigrants in California will account for almost half (41%) of the uninsured population in this state, and at least a third of the uninsured in others states with high concentration of undocumented immigrants (i.e., Arizona, Florida, North Carolina, Texas) (Wallace *et al.*, 2013). Revisions to current health policies, including those at federal and state levels, as well as the development of new alternatives to facilitate access to health insurance for marginalized immigrants is needed to ameliorate the burden faced by safety-net providers in areas with high concentrations of uninsured undocumented immigrants. A potential alternative to consider is to allocate additional funding to support safety-net providers in high-density Mexican and Central-American immigrant communities, as well as provide undocumented immigrants with opportunities to purchase low cost health insurance, which should include the provision of specific prevention health screens. Also, allowing for binational insurance coverage that pays for high-cost services in Mexico, but provide coverage for primary care in the U.S. could be another way to facilitate access to insurance coverage for the undocumented population (Wallace *et al.*, 2013).

Another relevant finding in this study is that participants who reported having a chronic health condition were more likely to report *recent* rather than *delayed* RMC use. Awareness of a health condition may increase awareness of the need for having annual checkups to prevent worsening of symptoms. It is common among Latinos to seek or postpone medical care until symptoms are present, which are usually severe (Leybas-Amedia, Nuno and Garcia, 2005). Early and clear diagnoses of illnesses, particularly for those that are asymptomatic, may be valuable to increase adherence to periodic use of RMC in this population. Given the high prevalence of chronic health conditions such as diabetes, heart disease and obesity, as well as high rates of preventable cancers in this population, it is important to develop contextually and culturally-sensitive campaigns to promote compliance with recommended health screenings in this population (USMBCC, 2010).

Several studies show trust in healthcare providers to be a predictor of healthcare service use (Larkey *et al.*, 2001). However, this study is the first to explore trust or *confianza* as a general disposition associated with healthcare service use. In this study, respondents with higher levels of *confianza* were likely to *delay* RMC use when compared to those with *recent* use. Although this association may seem contradictory, it is possible that the association between *confianza* and preventive healthcare service use could be mediated by self-rated health and optimism. Previous research shows that individuals with a greater disposition to trust report higher levels of self-rated health and wellbeing (Kim, Sinco and Kieffer, 2007; Mohseni and Lindstrom, 2007; Molina, Zambrana and Aguirre-Molina, 1994; Schwarzer, 1994). In other words,

individuals with a higher disposition to trust may be likely to have an over-optimistic view of their health and a reduced risk perception for illness, which may invalidate a need for periodic use of medical check-ups. The need for periodic medical check-ups may be further undermined by a tendency to use healthcare services mostly in the face of symptoms, rather than for prevention (Larkey *et al.* 2001). Another way in which *confianza* may contribute to delayed RMC use may be related to the cultural belief of *fatalism*, which emphasizes that events are predetermined by fate; thus, inevitable (Larkey *et al.*, 2001; Molina, Zambrana and Aguirre-Molina, 1994). A belief in predetermined fate may discount the importance of periodic RMC to ensure health. The role of trust and its association to perceived-health and use of RMC in this population is not well understood; thus, additional studies are needed.

Limitations. This study has some limitations. First, source of care was not measured. Having a usual source of care is associated with increased utilization (Vargas-Bustamante *et al.*, 2009; Vargas-Bustamante *et al.*, 2010). Nevertheless, other important factors were identified (e.g., undocumented status, *confianza*). Second, this study relied on self-report and retrospective data, which may have led to over/under estimation of RMC timeframe. Third, disclosure of legal status is a sensitive matter; thus, some respondents, particularly the undocumented, may have misrepresented their legal status, which may result in more conservative estimates. Fourth, the question used to assess use of RMC may not adequately capture the use of less-traditional prevention healthcare services common among this population (e.g., homeopathic, complementary/alternative medicine). Future studies should consider assessing the use of less-traditional healthcare prevention services. Fifth, the 23% cooperation rate may reflect a self-selection bias. Nevertheless, this survey used multistage sampling to minimize threats to external validity, and as a result, the sample included adequate variation in the immigration status of participants. Also, this sample was predominately female; thus, this study may not adequately represent level of RMC use among MI-MA males in this region. A similar study with a larger sample of men is necessary to assess the generalization of study findings. Finally, these findings might not generalize to MI-MA living in non-border regions, as well as to other non-Mexican populations along the border and living in the U.S. Given the use of cross-sectional data, causality cannot be inferred.

6. Conclusion

MI-MA living on the California-Mexico border are at significant risk for developing health problems; RMC use is suboptimal (USMBCC, 2010). To improve use, outreach efforts should target MI-MA of lower socio-economic status, particularly the undocumented and uninsured. This may require the support of safety net providers, as well as events such as health fairs and periodic health screenings at shelter and federally qualified healthcare centers to facilitate access. In addition, disseminating information to the community in a way that is contextually and culturally sensitive about the importance of periodic healthcare services may be helpful, as well

as advocating for the development of policies favoring access to affordable healthcare and insurance regardless of immigration legal status. All of the aforementioned recommendations require collaboration between community-based organizations, healthcare providers, researchers and those in charge of developing and influencing economic and public policy. Addressing the unique healthcare needs of MI-MA in the U.S.-Mexico border region is complex, but it is in the best interest of both nations to increase access to preventive healthcare services among the largest Latino subgroup in this region (CMHI, 2010).

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8. Authors note

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References

- Anders, R.L (2013), "Hispanic health disparities on the US-Mexico border", accessed September 2011 <http://hhdc.utep.edu/seminars/border-health/disparities>.
- Berk, M.L., Schur, C.L., Chavez, L.R., et al. (2000), "Health care use among undocumented Latino immigrants", *Health Affairs*, Vol. 19, pp. 51-64.
- Berk, M., and Schur, C (2001), "The Effect of Fear on Access to Care Among Undocumented Latino Immigrants", *Journal of Immigrant Health*, Vol. 3, No. 3, pp. 151-156.
- California-Mexico Health Initiative (2010), "Mexican-Origin Population in California: Health Fact Sheet", accessed on September 2011 at <http://www.lapublichealth.org.spa8.docs/mexoriginfacts.pdf>
- Center for Disease Control and Prevention (2009), "Behavioral Risk Factor Surveillance System Questionnaire", accessible on June 2011 at <http://www.cdc.gov/brfss/questionnaires/pdf-ques/2008brfss.pdf>
- D-Emilia, B.J., and Suplee, P.D (2012), "The ACA and the Undocumented", *American Journal of Nursing*, Vol.112, pp. 21-27.
- Fuentes-Afflick, E., and Hessol, N.A (2009), "Immigration status and use of health services among Latina women in the San Francisco Bay Area", *Journal of Womens Health*, Vol.18, pp. 1275-1280.
- Galarneau, C (2011), "Still Missing: Undocumented Immigrants in Health Care Reform", *Journal of Health Care for the Poor and Underserved*, Vol. 22, pp. 422-428.
- Gelberg, L., Andersen, R.M., and Leake, B.D (2000), "The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people", *Health Services Research* Vol. 34, pp. 1273-1302.
- Goldman, D.P., Smith, J.P., and Sood, N (2005), "Legal status and health insurance among immigrants", *Health Affairs*, Vol. 24, pp. 1640-1653.
- Kim, C., Sinco, B., and Kieffer, E.A (2007), "Racial and ethnic variation in access to health care, provision of health care services, and ratings of health among women with histories of gestational diabetes mellitus", *Diabetes Care*, Vol. 30, pp. 1459-1465.
- Kroenke, K., Spitzer, R.L., and Williams, J.B (2001), "The PHQ-9: validity of a brief depression severity measure", *Journal of General Internal Medicine*, Vol. 16, pp. 606-13.
- Larkey, L.K., Hecht, M.L., Miller, K., and Alatorre, C (2001), "Hispanic cultural norms for health-seeking behaviors in the face of symptoms", *Health Education & Behavior*, Vol. 28, pp. 65-80.
- Leybas-Amedia, V., Nuño, T., and Garcia, F (2005), "Effect of acculturation and income on Hispanic women's health" *Journal of Health Care for the Poor & Underserved*, Vol.16, pp. 128-141.
- Marcelli, E.A., Holmes, L., and Estella, D (2009), "(In)Visible (Im) Migrants: The Health and Socio-economic Integration of Brazilians in Metropolitan Boston" San Diego, CA: Center for Behavioral and Community Health Studies, San Diego State University.
- Marin, G., and Gamba, R.J (1996), "A new measurement of acculturation for Hispanics: The Bidimensional Acculturation Scale for Hispanics (BAS)", *Hispanic Journal of Behavioral Sciences*, Vol. 18, pp. 297-316.
- Merenstein, D., Daumit, G.L., and Powe, N.R (2006), "Use and costs of nonrecommended tests during routine preventive health exams", *American Journal of Preventive Medicine*, Vol. 30, pp. 521-527.
- Merz, E.L., Malcarne, V., Roesch, S.C., Riley, et al. (2011), "A multigroup confirmatory factor analysis of the Patient Health Questionnaire-9 among English- and Spanish-speaking Latinas", *Cultural Diversity & Ethnic Minority Psychology*, Vol. 7, pp. 309-316.
- Mohseni, M., and Lindstrom, M (2007), "Social capital, trust in the health-care system and self-rated health: the role of access to health care in a population-based study", *Social Science & Medicine*, Vol. 64, pp. 1373-1383.
- Molina, C.W., Zambrana, R.E., and Aguirre-Molina, M (1994), *The influence of culture, class, and environment on health care*, American Public Health Association, Washington DC.
- Ortega, A. N., Fang, H., Perez, V. H., Rizzo, J. A., et al. (2007), "Health Care Access, Use of Services, and Experiences Among Undocumented Mexicans and Other Latinos", *Archives of Internal Medicine*, Vol. 167, No. 21, pp. 2354-2360.
- Parchman, M., and Byrd, T (2001), "Access to and use of ambulatory health care by a vulnerable Mexican American population on the US-Mexico border", *Journal of Health Care for the Poor & Underserved*, Vol. 12, pp. 404-414.
- Motel, S., and Patten, E (2012), "Hispanics of Mexican Origin in the United States, 2010: Statistical Profile" accessed August 2011 <http://www.pewhispanic.org/2012/06/27/hispanics-of-mexican-origin-in-the-united-states-2010/>
- Pew Hispanic Center (2011), "U.S. population projections: 2005-2050", accessed August 2011, <http://pewhispanic.org/reports/report.php?ReportID=85>
- Schwarzer, R (1994), "Optimism, vulnerability, and self-beliefs as health-related cognitions: A systematic overview", *Psychology & Health*, Vol.9, pp. 161-180.
- Subramanian, S.V., Kim, D.J., and Kawachi, I (2002), "Social trust and self-rated health in US communities: a multilevel analysis", *Journal of Urban Health*, Vol. 79, pp. S21-34.

- U.S. Census Bureau (2009), "American Community Survey" accessed July 2011 <http://www.census.gov/acs/www/>.
- U.S. Department of Health and Human Services (2003), "Prevention makes common "cent", accessed September 2011 <http://aspe.hhs.gov/health/prevention/>
- U.S. Department of Health and Human Services (2012). "Provisions of the Affordable Care Act, by year", accessed on July 2011 at <http://www.healthcare.gov/law/timeline/full.html>.
- U.S.-Mexico Border Counties Coalition (2010), "At the crossroads: U.S.-Mexico border counties in transition", accessed on September 2011 at <http://www.bordercounties.org>
- U.S.-Mexico Border Health Commission (2010), "Health disparities and the U.S.-Mexico Border: Challenges and opportunities", accessed on September 2011 at http://www.borderhealth.org/files/res_1719.pdf
- Vargas-Bustamante, A., Chen, J., Rodriguez, H.P., Rizzo, J.A., and Ortega, A.N (2010), "Use of preventive care services among Latino subgroups, *American Journal of Preventive Medicine*, Vol. 38, pp. 610-619.
- Vargas-Bustamante, A., Fang, H., Garza, J., Carter-Pokras, O., et al (2010), "Variations in Healthcare Access and Utilization Among Mexican Immigrants: The Role of Documentation Status", *Journal of Immigrant and Minority Health*, Vol. 66, pp. 561-577.
- Vargas-Bustamante, A., Hai Fang, R., and Ortega, A (2009), "Heterogeneity in health insurance coverage among US Latino adults", *Journal of General Internal Medicine*, Vol.24, pp. 561-566.
- Vittinghoff, E., and McCulloch, C.E (2007), "Relaxing the rule of ten events per variable in logistic and Cox regression", *American Journal of Epidemiology*, Vol.165, pp. 710-718.
- Wallace, SP., Gutierrez, V., and Brown, R (2003), "Mexican immigrants are generally healthier, but have less access to needed healthcare", *UCLA Center for Health Policy Research*, accessed on September 2011 at http://www.healthpolicy.ucla.edu/pubs/files/MexicanImmigrants_FactSheet.pdf
- Wallace, S.P., Torres, J.M., Norabi, T.Z., and Pourat, N. (2013), "Undocumented and Uninsured: Barriers to Affordable Care for Immigrant Populations", accessed on September 2011 at http://www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2013/Aug/1699_Wallace_undocumented_uninsured_barriers_immigrants_v2.pdf