

# Nativity and Cardiovascular Disease Screening Practices

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**Abstract** Cardiovascular diseases (CVD) are the leading causes of death among Mexican American adults living in the United States. Using data from a modified Behavioral Risk Factor Surveillance Survey and guided by the Anderson Model, this study examined the effect of nativity on CVD screening practices among 423 Mexican American adults living in Chicago. Dependent variables included having had a blood pressure and cholesterol screening and a routine checkup in the past 2 years. Multivariate analyses were used to control for sociodemographic factors, while accounting for complex sampling design. Compared to those born in Mexico, US-born Mexican Americans had significantly greater odds of obtaining blood pressure (OR = 5.61), and cholesterol screenings (OR = 1.60) and having a routine checkup (OR = 2.69) in the past 2 years. Health professionals with an agenda to increase screenings for CVD risk factors among Mexican Americans living in northern cities should understand the impact of nativity on screening practices.

**Keywords** Hispanic Americans · Mexican Americans · Immigrant · Health care utilization · Cardiovascular disease

## Background

Like other Americans, Mexican Americans living in the United States are more likely to die from cardiovascular diseases (CVD) than any other disease [1]. Latinos have a high prevalence of many CVD risk factors and behaviors.

More than half of Mexican American men and almost half of Mexican American women have high cholesterol [1]. In many cases, these risk factors are more prevalent among Latinos, especially Mexican Americans (MA) than among non-Hispanic Whites (NHW) [2]. This may reflect the fact that Mexican Americans are more obese and overweight, have a greater prevalence of diabetes and are more physically inactive than their NHW counterparts [1]. These statistics suggest the need to increase screening among Mexican Americans.

Screening for cardiovascular disease related risk factors is important for the prevention and early detection of CVD. It is estimated that as many as 50% of Mexican Americans with hypertension are unaware of their condition [2]. High blood cholesterol is another major risk factor for CVD and according to the National Health and Nutrition Examination Survey II (NHANES II), Latinos (no sub-group was specified) were less likely to have been screened for blood cholesterol in the past 5 years than were non-Hispanic Whites, after controlling for age, education, gender, health insurance and income [3]. More recent data from a Chicago study found that Latinos were less likely to engage in CVD blood pressure and cholesterol screenings compared to non-Hispanic White and Black women [4]. In addition, research indicates that Latinos were less likely to have reported seeing a physician in the last year compared to non-Hispanic Whites and Blacks [5].

Potential determinants of Latino screening disparities

Health care access is often cited as an explanation for health disparities among Latinos; more Latinos are uninsured than other ethnic groups and Mexican Americans have the highest proportion of uninsured [6]. However, research using the Medical Expenditure Panel Survey (MEPS) examined

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insured persons in both fee-for-service and health maintenance organizations and found that even with insurance coverage, Latinos were less likely to report having had a blood pressure or blood cholesterol screening in comparison to non-Hispanic Whites for both types of coverage [7]. This suggests the presence of barriers beyond health insurance coverage.

Although there is some literature on factors influencing CVD preventive behaviors among Latinos, there appears to be a general absence of information regarding specific correlates of screening behavior. There is little known about the effects of nativity, or place of birth on CVD screenings. Nativity is a relevant correlate to consider when examining the behavior of Latinos and specifically Mexican Americans. Immigrants from Mexico tend to come to the United States for economic reasons. They often come from low socioeconomic and lower education backgrounds [8, 9]. Underutilization of preventive health care is a known issue among Latinos [8–10]. Mexican Americans are the least likely Latino sub-group to have health insurance coverage. Low wage jobs, language barriers, poor and crowded housing conditions, and lack of health care coverage impact immigrant health [5, 9, 11, 12].

A relationship between nativity and screening behaviors and risk factors for cancer among Latinas has been established. Mexican-born women were less likely to receive breast cancer screening compared to US born women. They also had lower income, less education and were less likely to be covered by health insurance [9].

An additional consideration that is often overlooked when examining ethnic differences in screening practices is the heterogeneity of the Latino population. Latinos as a group include individuals representing many different national origins and many cultures. To our knowledge, however, there are no published studies that specifically examine the CVD screening practices of Mexican Americans. This is noteworthy given that persons of Mexican origin represent the largest proportion of Hispanics currently residing in Chicago and the United States [13, 14]. The lack of information on CVD screening practices among specific sub-groups of Latinos would thus appear to be another important limitation of the available literature.

To address these knowledge gaps, this paper investigates the effects of nativity on CVD screenings and general health care utilization among MA adults living in Chicago. Most available research concerning the health of Mexican Americans in the United States has focused on those living in Border States. Chicago offers a unique setting for conducting this research. Chicago, like many northern cities in the United States, experienced an increase in the proportion of Latinos between the 1990 and 2000 US Census. Based on US Census data, Latinos make up 26% of the city's population, the third largest ethnic population in the city [14]. About

68% of Chicago Latinos are Mexican–American, which corresponds to over one half million Mexican Americans in a city of almost three million people [13]. Consequently, this study provides an important new urban setting in which to examine the health-related behaviors of this growing population.

## Methods

### Instrument

This study's data come from two separate telephone administrations of a modified version of the Behavioral Risk Factor Surveillance Survey, the Lawndale and Greater Lawn surveys. The University of Illinois at Chicago Survey Research Laboratory administered the surveys in the winter of 2000 in four neighborhoods on the south side of Chicago, North and South Lawndale, West Lawn and Chicago Lawn. These neighborhoods have high concentrations of Latinos and non-Hispanic Blacks.

### Data collection

The sample was identified using a dual sampling frame that employed both the Mitofsky–Waksberg and list-assisted approaches [15], and the Trodahl–Carter method to randomly select one respondent age 18 or older within a household [16, 17]. Surveys were administered in both Spanish and English. Data were weighted for selection probabilities; post-stratification weights also were included.

The response rates for the two surveys were computed as the ratio of completed interviews to the sum of the subjects known to be eligible using the standard response rate formula RR3, as defined by the American Association for Public Opinion Research [18]. The response rate was 46.8% for the Lawndale survey and 30.2% for the Greater Lawn survey [19, 20]. These response rates are within the range for telephone surveys conducted in the United States in the late 1990s and early 21st century [21] and reflect the practical difficulties of conducting survey research in urban environments [22].

### Sample

Of the 819 respondents interviewed, 446 self-identified as Latinos. Of these, 423 reported that they were of Mexican origin. Because CVD-related risk factors are prevalent not just among older adults but throughout adulthood [1], the entire adult Mexican-American sample of 423 was included in all analyses.

**Measures**

**Dependent variables**

Three CVD-related screening variables were examined: 1) receipt of a routine physician visit during the past 2 years, 2) receipt of a blood pressure check by a physician during the past 2 years, and 3) receipt of a blood cholesterol check in the past 2 years. A 2-year time frame for these measures was selected based on American Heart Association recommendations for at-risk persons [23].

**Independent variables**

Independent variables were chosen based on the Andersen Model [24]. Predisposing factors are demographic factors that, according to the model, impact utilization of health care. The study focused on the influence of nativity. Additional predisposing factors were examined based on the Andersen Model and include gender, age and marital status. Nativity, was measured by the question, ‘Were you born in the United States?’ which was a dichotomous measure. Age was collapsed into three categories, 18–29 years old, 30–39 years old, 40 years old and older, based on the age distribution of the sample and the recommended age for which the American Heart Association recommends blood cholesterol screenings every two years regardless of risk [23]. Marital status was collapsed into a dichotomous variable representing those who currently have a domestic partner or spouse who may provide social support and those who are divorced, single or widowed, therefore lacking that particular type of support.

**Table 1** Demographic characteristics by place of birth among Mexican Americans

Characteristic	Born in the United States Percentage (SE)	Born in Mexico Percentage (SE)
Sample total	20.6 (n = 87)	79.4 (n = 336)
<i>Predisposing factors</i>		
Gender***		
Female	34.6 (1.7)	16.3 (1.3)
Male	21.8 (1.5)	27.4 (1.6)
Marital status***		
Married/domestic partner	18.7 (1.4)	32.3 (1.6)
Not married/single	37.6 (1.7)	11.4 (1.1)
Age (in years)***		
18–29	16.2 (1.3)	11.6 (1.1)
30–39	10.5 (1.0)	15.1 (1.3)
40 +	29.6 (1.6)	17.2 (1.3)
<i>Enabling factors</i>		
Education***		
High school diploma	44.8 (1.7)	17.1 (1.1)
Less than high school	11.5 (1.1)	26.7 (1.5)
Health care coverage***		
Have health coverage	44.1 (1.7)	24.5 (1.5)
No health coverage	12.0 (1.2)	19.5 (1.4)

*Note.* This table presents the proportion demographic characteristics of Mexican Americans by place of birth and the standard error, adjusted for the complex sampling design.

\**p* < .05, \*\**p* < .005, \*\*\* *p* < .001.

Enabling factors provide the means for use of health care and facilitate the likelihood of utilizing care. In this study, current health care coverage and education were explored as enabling factors for health care utilization [24]. Current health care coverage was defined as currently having “any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare.” Education is an enabling factor of health care utilization in that higher education level can increase ability to understand and maneuver the health care system and communicate with providers. The education question was “What was the highest grade or year in school you have completed?” and because so few Mexican Americans reported having higher education, the answers were collapsed into less than a high school education and having at least a high school diploma.

**Data analyses**

Bivariate cross tabulation and logistic regression were employed to examine associations between nativity, other covariates, and the dependent variables [25, 26]. Due to the complex sampling design, a design-based analysis was conducted using STATA program. Bivariate analyses were conducted using the “svytab” procedure [27]. These results are shown in Tables 1 and 2.

Health care coverage is known to be associated with nativity. According to the Kaiser Foundation, in 2003, 52% of recent immigrants were uninsured and employment status did not explain this disparity [2]. This suggests that health care coverage may be responsible for the relationship between nativity and the CVD screening measures shown in



**Table 2** CVD screening practices in the past 2 years among Mexican Americans, by demographic characteristics

Characteristic	Blood pressure screening (yes)	Blood cholesterol screening (yes)	Routine check-up (yes)
Sample total, % ( <i>n</i> )	86.1 (360)	32.7 (137)	70.1 (295)
<i>Predisposing characteristics, % (SE)</i>			
Birthplace ( <i>n</i> )	418	419	421
United States	96.6 (2.0)	47.1 (5.5)	85.4 (3.9)
Mexico or other	83.7 (2.0)	29.2 (2.5)	66.1 (2.6)
Chi-square <i>p</i> -value	0.002	0.002	<0.001
Gender ( <i>n</i> )	418	423	421
Male	82.1 (2.4)	28.3 (2.8)	61.8 (3.0)
Female	93.6 (2.0)	40.8 (4.0)	84.2 (3.0)
Chi-square <i>p</i> -value	0.008	0.01	<0.001
Marital status, <i>n</i>	418	423	421
Married/domestic partner	87.3 (2.0)	34.8 (2.8)	69.2 (2.8)
Not married/single	84.2 (3.2)	28.5 (3.9)	71.7 (3.9)
Chi-square <i>p</i> -value	ns	ns	ns
Age (in years)			
18–29	86.7 (2.8)	29.1 (3.9)	72.2 (3.8)
30–39	83.9 (3.2)	23.9 (3.8)	67.8 (4.2)
40+	87.7 (2.7)	44.4 (4.2)	70.7 (3.8)
Chi-square <i>p</i> -value	ns	0.001	ns
<i>Enabling characteristics, % (SE)</i>			
Education	415	419	417
High school diploma	89.3 (2.2)	33.8 (3.4)	74.9 (3.2)
Less than high school	83.7 (2.5)	31.7 (3.1)	65.9 (3.2)
Chi-square <i>p</i> -value	ns	ns	0.046
Health care coverage, <i>n</i>	417	418	420
Currently have health coverage	54.1 (2.5)	21.9 (2.0)	43.7 (2.4)
No health coverage	32.2 (2.3)	10.8 (1.5)	26.2 (2.2)
Chi-square <i>p</i> -value	<0.001	<0.01	<0.01

*Note.* This table presents the proportion demographic characteristics of Mexican Americans who reported having been screened in the past 2 years.

SE: standard error, *ns*: not significant at the 0.05 level of significance.

Table 1. Education and gender are known to be associated with health care coverage, calling into question the degree to which nativity may be directly influencing CVD screening behaviors [9]. Further, gender and marital status are known factors that influence self health ratings of immigrants, which may impact seeking health care. Gender is shown to play a role in the likelihood of seeing a physician in the past year and obtaining CVD screenings among Mexican Americans [10]. To answer the question about differences in CVD-related screening practices by nativity, I estimated logistic regression models designed to evaluate the effects of nativity, net of other covariates, for each of the three screening practices. Interaction between nativity and gender were considered because MA women are more likely than men to use health care regardless of becoming acculturated to US culture [10]. However, no interaction effect was found and therefore none were included in the model. Logistic regression models were estimated using the STATA “svylogit” procedure, which adjusted for the complex sampling design [27]. The results of these analyses are shown in Table 3.

## Results

### Demographic and health behavior profiles

Table 1 shows nativity by sociodemographic factors organized according to whether they are predisposing or enabling factors for health care utilization. Nativity was associated with gender, education, and age as well as current health care coverage and marital status. Just over three quarters of Mexican Americans in the sample were born in Mexico. Proportionally more men emigrated from Mexico compared to females. More Mexican Americans born in the United States reported having at least a high school diploma than those born in Mexico and a larger percentage of those born in the United States reported having some type of health insurance coverage at the time of interview. The majority indicated they were married or living with a partner.

Table 2 presents sociodemographic factors for CVD screenings and routine checkup. Most respondents received a blood pressure screening and a routine checkup during the past 2 years, yet only about one-third of Mexican Americans indicated they had a blood cholesterol screening during the

**Table 3** CVD-related screening practices in the past 2 years among Mexican Americans

Characteristic	Blood cholesterol checked		Blood pressure checked		Routine check-up	
	OR	CI	OR	CI	OR	CI
<i>Main effects</i>						
<i>Predisposing characteristics</i>						
Place of birth						
United States	2.69**	1.47, 4.92	5.61*	1.40, 22.47	2.54*	1.20, 5.36
Mexico	1.00	—	1.00	—	1.00	—
Gender						
Female	1.54	0.98, 2.41	3.32**	1.52, 7.29	3.32***	1.95, 5.65
Male	1.00	—	1.0	—	1.00	—
Marital status						
Married/domestic partner	1.60	0.95, 2.70	1.60	0.82, 3.12	0.93	0.54, 1.59
Not married/single	1.00	—	1.00	—	1.00	—
Age						
18–29 years old	1.00	—	1.00	—	1.00	—
30–39 years old	0.93	0.50, 1.72	0.78	0.38, 1.63	1.03	0.57, 1.84
40 years and older	2.51**	1.44, 4.39	1.18	0.55, 2.54	1.17	0.67, 2.07
<i>Enabling characteristics</i>						
Education						
High school diploma	0.98	0.61, 1.58	1.14	0.57, 2.25	1.23	0.76, 2.00
Less than high school	1.00	—	1.00	—	1.00	—
Health care coverage						
Have health coverage	1.62*	1.02, 2.58	5.21***	2.67, 10.16	1.81*	1.15, 2.85
No health coverage	1.00	—	1.00	—	1.00	—

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .005$ , after controlling for all other variables shown in table.

past 2 years. There were differences in all screening practices by nativity, gender, and health care coverage. Age differences were only found for blood cholesterol screening in the past 2 years.

**Multivariate analysis results**

The multivariate model is presented in Table 3. There were significant differences in screening practices between those who immigrated to the United States and those who were born in the United States even after controlling for pertinent demographic characteristics.

**Blood cholesterol screening**

Mexican Americans living in Chicago who were born in the United States had 2.69 (95% 95%CI: 1.47, 4.92) times greater odds of having a blood cholesterol screening in the past 2 years compared to those who immigrated to the United States. Current health care coverage (OR: 1.62, 95%CI: 1.02, 2.58) and being 40 years old and older (OR: 2.51, 95% CI: 1.44, 4.39) were independently associated with blood cholesterol screening in the past 2 years.

**Blood pressure screening**

Compared to their Mexico born counterparts, Mexican Americans living in Chicago who were born in the United

States had 5.61 (95% CI: 1.40, 22.47) times greater odds of having had a blood pressure screening. Women had 3.33 times greater odds (95% CI: 1.52, 7.29) of having their blood pressure checked in the past 2 years compared to men. Those with health care coverage had about five times (95%CI: 2.67, 10.16) greater odds of having a blood pressure screening in the past 2 years compared to those who did not report having health care coverage at the time of the interview.

**Routine checkup**

Mexican Americans living in Chicago who were born in the United States had 2.54 times greater odds (95% CI: 1.20, 5.36) of having a routine check-up in the past 2 years, after controlling for all other variables. Other variables were significantly associated with having had a routine check up. Women had 3.32 times greater odds (95% CI: 1.95, 5.65) of having a routine check up in the past 2 years compared to men. Those with health care coverage had 1.81 times greater odds (95% CI: 1.15, 2.85) of having a routine check up in the past 2 years compared to those who did not reporting having health care coverage. The results support the Andersen model that predisposing and enabling factors impact health care utilization. The results also indicate that certain predisposing factors appear to influence utilization of CVD related screenings regardless of the enabling resources of education and health care coverage.



## Discussion

A national campaign to increase CVD screening awareness and practices began in 1985 and subsequently many more Americans are obtaining screenings for early detection of cardiovascular disease [28]. The percentages of screening for hypertension across the nation have been consistently above 70% since 1991. For most states, including Illinois, there has also been an increase in percentage of Americans reporting cholesterol screening. However, evidence indicates that the percentages of Latinos obtaining blood pressure and cholesterol screenings are lagging behind national trends [29, 30]. Results from previous studies comparing Latinos to other race/ethnic groups have shown that Latinos are less likely to obtain screenings for hypertension and high cholesterol even though there is evidence that they experience greater prevalence of risk factors [4, 10]. There is also literature that demonstrates Latinos are less likely to obtain general preventive services and obtain a routine check up [8, 12]. Although Illinois estimated that 94% of residents reported having had their blood pressure checked and almost 83% reported having had their cholesterol checked during the 2 years prior to 1999 [31], the present study found that only 86% of Mexican Americans living in Chicago reported having had their blood pressure checked and only 33% reported having had their cholesterol checked in the past 2 years.

The fact that there are few studies examining potential correlates of the lag in CVD screening trends among Latinos is alarming. This investigation is unique in that it examines nativity as a correlate of CVD screenings and a routine checkup among Mexican Americans living in a northern urban area, Chicago, Illinois, a relationship, which to the author's knowledge, has not been reported previously. Multivariate analyses showed that after controlling for all other factors, those born in Mexico were less likely to obtain blood pressure and cholesterol screenings and less likely to have received a routine check in the past 2 years compared to Mexican Americans born in the United States. There is little doubt that lack of health care coverage is a factor among Mexican Americans and even more so among those not born in the United States [2]. In this study, health insurance coverage predicted blood pressure screening and having a routine checkup, yet it did not fully explain differences by place of birth for those behaviors. This association supports existing literature that indicates that health care coverage is an important enabling factor correlated with health care utilization among Latinos, especially those who emigrated to the United States [2]. However, it does not fully explain underutilization [2, 7, 8]. These findings also suggest that although health care coverage is important, there are other factors, which may influence utilization.

Women were also more likely than men to report having had their blood pressure checked and a routine checkup

in the past 2 years. These results are consistent with current health care utilization literature [32]. This study did not find education (an enabling factor), correlated with screening practices and a routine checkup, even though proportionally more Mexican Americans born in the United States reported having at least a high school diploma compared to those who immigrated to the United States.

The present study also is distinctive in that it reports on Mexican Americans living in a northern US city. Many studies of Latino populations, such as those based on NHANES III and MEPS data, examine samples of Mexican Americans that are predominantly from the Southwestern areas of the United States, as the sampling designs for these studies over-sample this region. California and Texas have the highest concentrations of Mexican Americans [33, 34]. However, according to a U.S. Census Bureau's report, *The Hispanic Population*, Illinois, with more than one million Mexican Americans reported in 2000, is one of the states with the largest Mexican American population outside of the southwest [35]. There is evidence of state and regional differences in prevalence of CVD related risk factors and CVD mortality in the United States [36]. For example, between 1991 and 1995 in states with the largest number of Hispanics, the Hispanic mortality rates were higher than among northern states. The heart disease mortality rate in California was 260/100,000 and 403/100,000 among Hispanic women and men respectively, and in Texas, 296/100,000 for Hispanic women and 499/100,000 for Hispanic men. In Illinois, the heart disease mortality rates for Hispanic women and men during the same time period was 195/100,000 and 328/100,000, respectively [36]. These differences may be relevant for screening practices among Mexican Americans. Those living in cities in northern areas may be different from those living in the Southwest in respect to factors that may affect their CVD screening practices.

Early detection through screenings is an important method for the prevention and control of CVD. Therefore, the increased risk of CVD among Mexican Americans and the present findings of an association between nativity and CVD screening practices among Mexican Americans living in Chicago illustrate the need for further research to understand the differences in screening practices among this population. It also highlights the need to recognize that Latinos and even specific sub-groups of Latinos are not homogenous in regards to screening practices. Even more important is the need to understand what nativity is a proxy for in regards to its influence on CVD screenings. Nativity may reflect variation in cultural beliefs among Mexican Americans.

Research on acculturation and cultural factors that influence CVD screening is limited. A recent study found that acculturation level may be a factor contributing to disparities in screening practices among Mexican Americans. Those who

were fully acculturated were more likely to have received blood cholesterol and pressure screenings than those who were unacculturated [10]. There are far more studies exploring cultural factors that influence breast cancer screening practices among Latinas. These studies have cited fear, *descuido* (not taking care of oneself), and pain as barriers to obtaining mammograms [37]. Further, external health locus of control geared towards powerful others and chance were cited as barriers to breast cancer screenings among Latinas [37, 38]. Finally, some research indicates that Latina health beliefs about risk factors for breast and cervical cancer influence screening practices. Latinas have cited trauma, “bad behavior” by the patient or the patient’s spouse, and physical stress as causes of cancer [38]. These attitudes may be reasons why Latinas delay screenings or treatment. Similar cultural beliefs may be playing a role in the CVD screening practices of Mexican Americans and may partially explain nativity differences among this group. Cancer screening research and the present study suggests that there is a need to explore cultural factors that may influence CVD screenings among Mexican Americans. Finally, research on subgroup differences in CVD screening practices and research exploring cultural beliefs related to CVD screening practices among Mexican Americans can help public health professionals tailor CVD screening promotion campaign messages with the goal of decreasing the disparity in CVD screenings.

There are some limitations to this study. Because these data were collected as part of a surveillance tool for program planning, multiple measures of the constructs examined here were not available. The use of multiple indicators would have improved the reliability and comprehensiveness of this study. However, many of the BRFSS screening items employed in these analyses have been previously validated [40–42]. Additionally, this study cannot be generalized to all Chicago Latinas or to Mexican Americans living in other regions of the United States. As indicated above, southwestern states report higher age-adjusted rates of CVD and stroke mortality than Illinois [36]. Regional differences in CVD mortality rates also may reflect regional variations in screening practices and differences in other relevant health behaviors.

Another potential limitation is the survey’s response rate, in that non-response may be associated with the screening practices. If, for example, screening practices are lower among undocumented Mexican Americans and undocumented persons are less likely to participate in telephone interviews, the estimates reported here may underestimate the differences in CVD screening practices by place of birth among Mexican Americans. It should be noted, however, that there is no direct evidence that this is the case.

Despite these limitations, this study presents new information about CVD screening practices among Mexican Americans. Because Mexican Americans living in the United States are at increased risk, understanding the sociocultural

processes and differences among Mexican Americans that contribute to screening compliance is crucial. I hope this study stimulates more in depth research on the effects of nativity on Mexican American CVD screening practices to more fully understand why Latinos in general and specific sub-groups of Latinos lagging behind the national trends in obtaining the necessary screenings important for preventing the number one cause of death.

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