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Language, Nativity, or Both?

Oral Health among Mexican Americans

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Abstract

Objective: This study explores the effects of nativity and language preference among Mexican Americans to identify the primary drivers of poor oral health. **Materials and Methods:** We analyzed adult data from the National Health and Nutrition Examination Survey (NHANES 2011-2020), focusing on Mexican Americans (N = 2,840). The three outcomes were irregular dentist visits, self-rated poor oral health, and a clinical measure of missing or incomplete teeth. **Results:** Foreign-born Mexican Americans were less likely to have irregular dental visits (OR = 0.59), but this trend reversed for Spanish speakers (OR = 1.36), who reported more irregular visits than English speakers. Spanish-speaking Mexican Americans showed worse oral health and more missing teeth, highlighting the negative impact of language barriers. **Conclusion**: Nativity and language preference interact to limit access to dental care. Spanish-language preference is linked to more severe oral health issues, while foreign-born status is more closely tied to irregular dental visits.

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Introduction

Oral health is a comprehensive health indicator that often reflects an individual's socioeconomic status and accessibility to health care. Oral diseases are progressive and cumulative but are sensitive to intervention, making access to quality dental care essential for maintaining health [1]. Disorders of the mouth, including teeth, palate, and related soft tissues can have a significant impact on quality of life [2]. Poor oral health is associated with poor mental health, such as stress, anxiety, and depressive symptoms [3-6]. Poor oral health is also an important risk marker of cardiovascular disease and cancer [7-9]. Across a range of health and health service use outcomes, Mexican Americans fare worse than their Non-Latino White counterparts. Limited existing research suggests a "healthy immigrant" effect may extend to oral health, with first-generation Latino immigrants reporting better oral health-related quality of life than U.S.-born Latinos. Factors related to nativity, such as immigrants' length of stay in the U.S., age at immigration, and the country of origin are identified as key factors in the likelihood of receiving timely and appropriate health care for anything [10-12], including oral disease prevalence [13,14].[13]

Two primary mechanisms link nativity and oral health. First, disparities in public health infrastructure and healthcare accessibility between emigration countries and the U.S. affect post-migration health [15]. Several studies have found differences in oral health and access to dental services between foreign-born and native-born Americans. Foreign-born adults are more likely than US-born adults to report poor oral health when they are not insured [16,17]. Foreign-born adults have lower usage of dental services than native-born adults [18,19]. Mexican immigrants typically occupy occupations lacking dental insurance access, such as agriculture. Additionally, deficient preventive oral healthcare infrastructure in emigration countries (e.g., non-fluoridated water) may initiate oral diseases earlier in life [20]. Second, English proficiency significantly influences healthcare access. Approximately 35% of Mexican

American adults, and up to 67% are foreign-born and lack English proficiency [21]. Language barriers, inadequate interpreter services, and discrimination restrict healthcare access [22], reducing preventive service use among Spanish-speaking Latinos [23,24]. Further, patients with limited English proficiency are more likely to report lower quality of communication with physicians [25].

Most research on language-related oral health disparities has focused on children, showing poorer dental conditions and lower-quality dental care among those from non-English speaking households [26,27]. Children in Latino families, especially Spanish-speaking families, are more likely to receive lower quality dental care than children in White English-speaking families. Even in states with high Mexican populations, public programs like California's Denti-Cal often remain underfunded and inaccessible [28]. As a result, US-born Mexican American children tend to have high rates of severe ECCs that result in pulled teeth before the age of 4 [29].

Previous research commonly groups all Latinos together rather than isolating Mexican Americans. Given that Mexican Americans constitute 62% of U.S. Latinos and mostly are U.S.-born (71%), aggregation masks meaningful distinctions from groups with different immigration paths (e.g., Puerto Ricans) or more recent immigrant histories (e.g., Central Americans). To date, no comprehensive study specifically investigates how nativity and English proficiency influence oral health among Mexican Americans across socioeconomic statuses. In a rare study, Spolsky and his colleagues report that Mexican immigrants have better oral health than other Latino immigrants [30]. However, this study is based on a very small sample (N=240) from a local community in Los Angeles. Other studies found that compared to Whites, Mexican Americans report higher numbers of decayed teeth, fewer filled teeth, and fewer dental checkups [31-33]. Given the substantial heterogeneity in nativity and language fluency among Mexican Americans, understanding the factors driving these differences is critical.

Material and Methods

Data

In this study, we use the adult data files from the National Health and Nutrition Examination Survey (NHANES 2011-2020). NHANES is a national representative survey using a multistage probability sample design. Our analytic sample is limited to Mexican Americans, as identified through the "Mexican origin" subquestion of Hispanic ethnicity. We then identified those who were born in the United States and those born outside the United States to classify nativity. Primary language was determined based on the language used during the NHANES household interview. Respondents who chose to complete the survey in Spanish were classified as Spanish speakers, based on the assumption that their language preference in the interview reflects predominant use in other settings, including at home. This does not imply they do not speak English, but rather that they may be less comfortable using English in moderately complex contexts such as a lengthy survey. Respondents who selected English were classified accordingly. Due to the absence of interview language information in the NHANES 2021–2023 wave, we limited analyses to 2011–2020. The final sample includes 2,840 Mexican Americans. In the final analytic sample, 1,251 participants were U.S.-born and 1,589 were foreign-born; 1,533 completed the interview in English and 1,307 in Spanish.

Measures

We examined three outcomes under study: (1) irregular dental visits; (2) self-rated oral health; and (3) number of missing or incomplete teeth. The first two outcomes are from the survey, while the third outcome is from the NHANES clinical examination. For *irregular dental visits*, respondents were asked "When did you last visit a dentist?" We recoded half a year and at least once a year as regular dental visits (=0) and those who report less frequent or no dental visits as irregular visits (=1). For *self-rated oral health*, respondents were asked, "Rate the health of your teeth and gums." Responses were recoded as fair or poor (=1), while all others were recoded as good or excellent (=0).

For *missing or incomplete teeth*, we utilized the clinical data where a dental professional conducted a full oral health examination. For each tooth classified as missing, decayed, fractured, or incomplete, we coded as 1. Intact teeth are coded as 0. We then sum the number of missing or incomplete teeth, producing a count ranging from 0 to 28, excluding the third molars.

In addition to nativity and language preference, we included a series of independent variables. *Insured* (=1) captures respondents who report coverage by any health insurance, including Medicare and Medicaid, and those with no insurance coded as 0. We utilized three measures of *socioeconomic status*: education, family income, and employment status. Education is categorized into three levels: Less than high school (=1), graduated from high school (=2), some college and above (=3). Less than high school is used as the reference category in the analysis. Family income is measured by the ratio of family income to the poverty threshold, which ranges from 0 to 5.

For employment status, respondents who were "working at a job or business last week" and those who were "with a job or business but not at work" were coded as currently working (1), and those who were "looking for or not working at a job or business" were coded as unemployed (0).

We also include demographics of gender and age. Female is coded 1 and male is 0. Due to age-related declines in oral health, we coded age as three age groups: ages 20 to 39, ages 40 to 59, and ages 60 and above.

Analysis

The analysis proceeded in three stages. First, we calculated the proportion, mean, and standard deviation (as appropriate) for each of the study variables for the total sample, then separately for the U.S.-born and foreign-born subsamples. We then reported the descriptive statistics separately for the English-speaking and Spanish-speaking subsamples. We tested for statistically significant differences between subsamples using the chi-square test or t-test. These results are presented in Table 1.

Second, we undertook multivariate analysis for the three outcomes; logistic regression for irregular dental visits and self-rated fair/poor oral health; and zero-inflated negative binomial model for the number of incomplete teeth. The "inflate(varlist)" specifies the equation that determines whether the observed count is zero in the zero-inflated negative binomial model. In our model, age was included because of the high level of correlation (correlation coefficient=0.45) between age and the number of missing teeth. We also include the key predictors, foreign-born status and Spanish-speaking to display the difference across groups. We assessed multi-collinearity among independent variables using the Variance Inflation Factor (VIF). A VIF threshold of 5 was used to identify potential multi-collinearity issues. All variables had VIF values below this threshold and the mean VIF for each analysis is 1.52 (outcome=irregular dentist visits), 1.52 (outcome=self-rated oral health), and 1.57 (outcome=incomplete teeth), which indicated an acceptable level of independence among predictors.

We stratified the analyses in two different ways. We first stratified the models by nativity status, controlling for language preference. Then we stratified the models by language preference, controlling for nativity status. The purpose of this approach was to test for

potential moderating effects within these subsamples across the covariates. Testing a large set of interaction terms is not parsimonious and risks multiple comparison bias. We formally tested contrasts in odds ratios with equality of coefficients tests ("suest" command in STATA) to determine if differences in effect of any independent variables or covariates differed significantly between subsamples. These results are presented in Tables 2 to 4.

Results

Descriptive characteristics

In the 2011–2020 NHANES, 2,840 participants were identified as Mexican Americans. Table 1 summarizes descriptive statistics for the full sample and two key subgroups: U.S.-born vs. foreign-born and English- vs. Spanish-preferred language. Over half of the total sample (56%) reported irregular dental visits, and 48% rated their oral health as fair or poor. The mean number of missing or incomplete teeth was 3.87 (SD = 6.45).

Foreign-born Mexican Americans had higher rates of irregular dental visits (58%) than U.S.-born Mexican Americans (52%), while Spanish-preferred speakers had markedly higher rates (63%) compared to English-preferred speakers (50%). For self-rated oral health, 55% of the foreign-born and 61% of Spanish-preferred Mexican Americans reported fair or poor health, versus 41% and 38% among their respective counterparts.

While there was no significant difference in tooth loss between U.S.-born and foreign-born groups, Spanish-preferred speakers had a higher mean number of missing teeth (4.18, SD = 6.73) than English-preferred speakers (3.62, SD = 6.2), regardless of nativity.

In terms of covariates, both foreign-born and Spanish-speaking groups had higher proportions of Mexican Americans with less than a high school education. U.S.-born and English-speaking Mexican Americans were slightly more concentrated in the younger age group (20–39).

Irregular dentist visits

Table 2 presents results for irregular dental visits. In the full model for the total sample of Mexican Americans, we see that those who are foreign-born are less likely to have irregular dental visits (OR = 0.59, $p < 0.001$) and those who speak Spanish predominantly are more likely to have irregular dental visits (OR = 1.36, $p < 0.05$). Compared to those with less than high school education, those with more education have lower odds of irregular dental visits (OR = 0.77, $p < 0.05$). There is a slight education gradient with the odds decreasing as education increases (OR = 0.68, $p < 0.01$). Those with any form of health insurance (OR = 0.47, $p < 0.001$) and women (OR = 0.64, $p < 0.001$) have lower odds of irregular dental visits. Compared to adults ages 20 to 39, older adults have lower odds of irregular dental visits (OR = 0.65, $p < 0.001$). Employment status is not significant.

In the first subsample comparison between US-born and foreign-born Mexican Americans, those who are foreign-born and speak Spanish as their primary language have significantly higher odds of irregular dental visits (OR = 1.62) than US-born Mexican Americans who speak Spanish (OR = 0.74). Indeed, among US-born Mexican Americans, language preference has no significant impact on the regularity of dental visits. On the other hand, education level is significantly associated with lower odds of irregular dental visits only among US-born Mexican Americans. Compared to those with less than a high school degree, those with a high school degree have 0.75 lower odds and those with more than a high school education have 0.79 lower odds of irregular dental visits. The effects of insurance status, family income to poverty ratio, being female, and age on irregular dental visits operate the same for both groups.

In the second subsample comparison of Spanish versus English language preference, we see that those Mexican Americans who prefer English and were foreign-born have significantly lower odds of irregular dental visits compared to those who prefer English but were US born. Nativity status is not significantly associated with irregular dental visits among those who speak Spanish. However, we interpret this with caution, as only 81 foreign-born persons prefer English. All other covariates operate similarly for both groups in the direction described above.

Self-rated fair/poor oral health

Our second outcome is self-rated fair or poor oral health, as presented in Table 3. In the model with the total sample, we observe that, consistent with irregular dental visits, those who are foreign born (OR = 0.69, $p < 0.01$) have lower odds and those who speak Spanish (OR = 2.02, $p < 0.001$) have higher odds of rating their oral health as fair or poor. Those who have more than a high school education have lower odds of poor oral health (OR = 0.65, $p < 0.001$), as well as higher family income to poverty ratio and having any health insurance (OR = 0.79, $p < 0.001$). Compared to adults ages 20 to 39, both mid-age (40-59, OR = 1.52, $p < 0.001$) and older age groups (60+, OR = 1.63, $p < 0.001$) are more likely to report poor oral health.

In the first subsample comparison of US-born versus foreign-born Mexican Americans, we see that language is a strong predictor of poor oral health, but only for foreign-born persons. Those who were foreign born and prefer Spanish have 2.63 times higher odds of poor oral health than their English-preferred foreign-born counterparts. Language preference has no effect on self-rated oral health for US-born Mexican Americans. Greater family income to poverty ratio is protective for both groups, but the effect is significantly stronger for US-born Mexican Americans (OR = 0.73 versus OR = 0.87).

In the second subsample comparison of English versus Spanish language preference, those who prefer English and were foreign born have significantly lower odds of reporting poor oral health relative to those who prefer English and were US-born. Among those who prefer English, having more education beyond high school shows a protective effect, but not for those who prefer Spanish. Among English speakers, those at higher ages are more likely to report poor oral health, but among Spanish speakers, there is no age pattern.

Missing or incomplete teeth

Our third outcome of tooth loss is presented in Table 4. In the subsample comparison of US-born and foreign-born Mexican Americans, language preference has no impact on the likelihood of tooth loss. US-born Mexican Americans who are unemployed are significantly more likely to have tooth loss (OR=1.3, $p < 0.01$) compared to foreign-born Mexican Americans who are unemployed. Foreign-born females have significantly greater tooth loss compared to US-born females (OR = 1.32, $p < 0.001$). Foreign-born Mexican Americans who are older than 60 (OR = 6.15, $p < 0.001$) displayed significantly more tooth loss than their US-born counterparts (OR = 4.23, $p < 0.001$). In the subsample comparison of English and Spanish language preference, nativity has no impact on either group. However, English-preferred Mexican Americans with more than high school education (OR=0.63) have significantly fewer missing or incomplete teeth compared to Spanish-preferred Mexican Americans with more than high school education. Spanish-preferred women (OR=2.96) have significantly more missing teeth compared to English-preferred women (OR=2.31). Age continues to be a strong predictor of tooth loss for both groups, though the impact of older age (60+) is significantly stronger for the Spanish-preferred subsample compared to the English-speaking subsample.

Discussion

Oral health significantly impacts overall well-being yet remains understudied in health disparities research. Previous studies showed evidence that low education and low income are associated with fewer dentist visits and poorer oral health [31-33]. Mexican Americans have comparatively lower education and income than Whites and other minorities. Furthermore, Mexican Americans experienced more barriers in accessing dental care, like a lower proportion of health insurance, language barriers, fears of deportation among undocumented Mexicans, and seeking dental care in Mexico as an alternative. Additionally, studies also found that Mexican Americans have a higher proportion of periodontal disease which is a major causality of tooth loss [31]. This study examines nativity and language preference among Mexican Americans to identify critical determinants of oral health disparities, analyzing irregular dental visits, self-rated oral health, and clinically assessed missing or incomplete teeth.

Consistent with prior research [21-24], irregular dental visits were highly prevalent, especially among Spanish-preferred speakers. After adjusting for relevant factors, language preference did not predict irregular dental visits among U.S.-born Mexican Americans but significantly predicted irregular visits among the foreign-born [17-20]. Although foreign-born Mexican Americans showed a higher proportion of irregular dentist visits, those who prefer to speak English displayed lower odds of dental care when adjusted for other factors. In this case, it appears that language and nativity work in conjunction to limit access to dental care. Irregular dental visits likely mean that individuals seek services only when they have an emergency, rather than engaging in routine preventive care. In 2018, there were more than 2 million visits for dental-related emergency department visits [34].

Self-rated oral health was poorest among foreign-born Spanish-preferring Mexican Americans and best among English-preferring Mexican Americans, diverging from prior studies that linked foreign-born status uniformly with worse oral health [16,17]. While previous research from Sanders [35] highlighted initial health advantages among immigrants, our findings specify that such protective effects among Mexican-origin immigrants largely apply to individuals proficient in English. U.S.-born Spanish speakers, although facing barriers to dental care, did not demonstrate significantly poorer self-rated oral health or tooth loss overall. However, among individuals aged 60 and older, Spanish-preferring speakers had notably higher odds of missing or incomplete teeth, indicating accelerated oral health decline and cumulative limited dental care access. We observed an educational gradient in oral health among U.S.-born but not foreign-born Mexican Americans, likely due to the latter group's heavy concentration in lower educational levels and specific occupations (e.g., agriculture). Additionally, health advantages of first-generation immigrants tend to diminish in subsequent generations as they adopt prevailing U.S. socioeconomic and health behavior patterns.

Our findings challenge the healthy immigrant hypothesis by presenting evidence that (1) foreign-born Mexican Americans exhibit lower educational attainment, lower health insurance coverage, and lower household incomes compared to U.S.-born counterparts, and (2) immigrant health advantages are not universal but limited to individuals with high English proficiency, who represent only about 5% of our sample (Table 5).

This study has three key strengths. First, our large sample of Mexican Americans allowed us to isolate the effects of nativity and language preference, enabling direct statistical comparisons between groups. Subdividing analyses revealed significant effects that were not evident in the total sample, highlighting the importance of examining heterogeneity among Mexican Americans beyond merely controlling for nativity and language. Second, we utilized three types of oral health outcomes, including a clinical measure of missing or incomplete teeth, complementing self-reported oral health and dental care utilization. Third, our use of interview language preference provided an innovative and reliable indicator of English proficiency, as Mexican Americans less confident in English logically preferred the Spanish survey given the detailed questions asked.

However, our study also has limitations. NHANES data lacked detailed immigration, occupation, and family status information, restricting analyses to basic socioeconomic and insurance measures. Additionally, the clinical assessment of missing or incomplete teeth did not distinguish between dental extraction and natural tooth loss. Interestingly, the association between medical insurance and increased tooth loss might indicate actual engagement in dental care.

In sum, we find that nativity and language preference play independent and interactive roles in oral health differences among Mexican Americans. English-preferring Mexican Americans have more access to dental care, but language preference among US-born Mexicans did not significantly influence any of the three oral health outcomes after adjusting for other factors. Evidence of missing and incomplete teeth at younger ages among all Spanish-preferred speakers does indicate some systemic barriers that warrant further study.

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Table 1. Descriptive statistics for oral health outcomes and independent predictors, Mexican Americans in NHANES 2011-2020 (N=2,840).

	Total	U.S.-born	Foreign-born	p-value	English Preferred	Spanish Preferred	p-value
	N=2,840	(n=1,251)	(n=1,589)		(n=1,533)	(n=1,307)	
Irregular Dental Visits	0.56[a]	0.52	0.58	0.003[d]	0.50	0.63	<0.001
Fair/Poor Oral Health	0.48	0.41	0.55	<0.001	0.38	0.61	<0.001
Number of Incomplete Teeth	3.87[b] (6.45[c])	3.89 (6.47)	3.86 (6.44)		3.62 (6.2)	4.18 (6.73)	0.002[e]
Any Health Insurance	0.64[a]	0.81	0.5	<0.001	0.79	0.47	<0.001
Education				<0.001			<0.001
1. Less than high school degree	0.28	0.08	0.43		0.08	0.51	
2. High school degree	0.40	0.43	0.38		0.43	0.37	
3. More than high school	0.32	0.49	0.18		0.49	0.12	
Family income to poverty ratio	2.47[b] (1.12[c])	2.82 (1.12)	2.19 (1.04)	<0.001	2.84 (1.11)	2.04 (0.97)	<0.001
Unemployment	0.38[a]	0.4	0.36	0.037	0.37	0.38	
Female	0.51	0.52	0.49		0.52	0.49	0.014
Age				<0.001			<0.001
20-39	0.39	0.44	0.34		0.44	0.32	
40-59	0.34	0.27	0.4		0.29	0.4	
60+	0.27	0.29	0.25		0.27	0.27	

Notes: a, proportion; b, mean c, standard deviation d, chi-square e, t-test was only used to examine the difference in the number of incomplete teeth

Table 2. Logistic regression model estimates of irregular dental visits, Mexican Americans, NHANES 2011-2020 (N= 2,840).

Irregular dentist visits	Total	U.S.-born	Foreign-born	English Preferred	Spanish Preferred
Foreign-born (ref = U.S. born)	0.588***[a]			0.52***	0.757
	[0.467 - 0.74]			[0.4 - 0.677]	[0.454 - 1.265]
Spanish (ref = English)	1.358*	0.738	1.622***		
	[1.065 - 1.733]	[0.428 - 1.273]	[1.226 - 2.144]		
Education (ref = less than high school diploma)					
High school diploma	0.768*	0.248***	0.919	0.496**	0.825
	[0.617 - 0.956]	[0.137 - 0.449]	[0.714 - 1.183]	[0.317 - 0.774]	[0.632 - 1.076]
More than high school	0.677**	0.211***	0.905	0.408***	1.012
	[0.524 - 0.874]	[0.115 - 0.388]	[0.651 - 1.256]	[0.258 - 0.643]	[0.685 - 1.494]
Family income to poverty ratio	0.801***	0.785***	0.838***	0.78***	0.87*
	[0.75 - 0.855]	[0.719 - 0.857]	[0.757 - 0.928]	[0.719 - 0.846]	[0.772 - 0.980]
Unemployed (ref = have a job)	1.204*	1.205	1.2	1.234	1.194
	[1.003 - 1.446]	[0.914 - 1.589]	[0.934 - 1.541]	[0.959 - 1.588]	[0.908 - 1.57]
Any health insurance (ref = no insurance)	0.469***	0.521***	0.44***	0.494***	0.439***
	[0.388 - 0.567]	[0.374 - 0.726]	[0.349 - 0.556]	[0.370 - 0.658]	[0.34 - 0.567]
Female	0.642***	0.706**	0.603***	0.690***	0.595***
	[0.547 - 0.754]	[0.556 - 0.895]	[0.483 - 0.754]	[0.557 - 0.856]	[0.465 - 0.762]
Age (ref = 20-39)					
40-59	0.828	0.848	0.8	0.875	0.774
	[0.684 - 1.003]	[0.632 - 1.138]	[0.619 - 1.035]	[0.673 - 1.138]	[0.58 - 1.032]
60+	0.645***	0.566***	0.662*	0.577***	0.693*
	[0.514 - 0.809]	[0.409 - 0.784]	[0.48 - 0.914]	[0.427 - 0.78]	[0.486 - 0.987]
Constant	6.597***	18.88***	2.996***	10.41***	6.324***
	[4.727 - 9.204]	[9.499 - 37.52]	[1.99 - 4.513]	[6.057 - 17.9]	[3.463 - 11.55]
Observations	2,840	1,251	1,589	1,533	1,307
Log-likelihood	-1803	-793.4	-996.5	-975.5	-819.3
Chi-square	295.8	144.5	168.8	174.2	90.58

.a. odds ratio and 95% CI in brackets
Boxes mean significant difference in slope
*** p<0.001, ** p<0.01, * p<0.05

Table 3. Logistic regression model estimates of self-rated fair/poor oral health, Mexican Americans, NHANES 2011-2020 (N= 2,840).

Variables	Total	U.S.-born	Foreign-born	English Preferred	Spanish Preferred
Foreign-born (ref = U.S. born)	0.693**[a] [0.548 - 0.876]			0.575*** [0.437 - 0.757]	1.178 [0.723 - 1.918]
Spanish (ref = English)	2.016*** [1.581 - 2.57]	1.037 [0.616 - 1.746]	2.631*** [1.989 - 3.479]		
Education (ref = less than high school diploma)					
High school diploma	1.003 [0.81 - 1.242]	1.082 [0.657 - 1.782]	0.865 [0.677 - 1.104]	0.841 [0.547 - 1.294]	0.893 [0.691 - 1.154]
More than high school	0.653*** [0.508 - 0.84]	0.563* [0.335 - 0.945]	0.833 [0.603 - 1.151]	0.475*** [0.304 - 0.74]	0.961 [0.661 - 1.398]
Family income to poverty ratio	0.788*** [0.737 - 0.843]	0.727*** [0.662 - 0.798]	0.868** [0.785 - 0.96]	0.759*** [0.696 - 0.827]	0.858** [0.764 - 0.963]
Unemployed (ref = have a job)	1.228* [1.024 - 1.472]	1.165 [0.884 - 1.536]	1.244 [0.971 - 1.592]	1.191 [0.925 - 1.533]	1.232 [0.942 - 1.611]
Any health insurance (ref = no insurance)	0.703*** [0.584 - 0.847]	0.843 [0.611 - 1.164]	0.656*** [0.52 - 0.828]	0.724* [0.545 - 0.963]	0.725* [0.564 - 0.931]
Female	0.985 [0.84 - 1.157]	0.977 [0.765 - 1.247]	1.01 [0.811 - 1.257]	0.984 [0.788 - 1.228]	1.0 [0.787 - 1.271]

Age (ref = 20-39)					
40-59	1.519*** [1.254 - 1.84]	1.819*** [1.336 - 2.476]	1.278 [0.995 - 1.642]	1.654*** [1.254 - 2.181]	1.287 [0.978 - 1.694]
60+	1.628*** [1.297 - 2.044]	2.035*** [1.458 - 2.84]	1.261 [0.917 - 1.733]	2.142*** [1.575 - 2.913]	1.09 [0.774 - 1.534]
Constant	1.323 [0.966 - 1.812]	1.348 [0.751 - 2.421]	0.756 [0.507 - 1.127]	1.681* [1.006 - 2.806]	1.665 [0.949 - 2.922]
Observations	2,840	1,251	1,589	1,533	1,307
Log-likelihood	-1804	-764.6	-1024	-927.2	-860.8
Chi-square	326.8	159.9	140.9	176.1	25.01

.a. odds ratio and 95% CI in parentheses
Boxes indicate significant difference between groups
*** p<0.001, ** p<0.01, * p<0.05

Table 4. Zero-inflated negative binomial regression model estimates of tooth loss, Mexican Americans, NHANES 2011-2020 (N= 2,840).

Incomplete Teeth	Total	U.S.-born	Foreign-born	English Preferred	Spanish Preferred
Foreign-born	0.895[a] [0.759 - 1.055]			0.862 [0.723 - 1.028]	1.033 [0.734 - 1.456]
Spanish (ref = English)	0.853 [0.719 - 1.011]	0.785 [0.562 - 1.097]	0.891 [0.73 - 1.089]		
Education (ref = less than high school diploma)					
High school diploma	0.891 [0.78 - 1.017]	0.782 [0.604 - 1.011]	0.922 [0.784 - 1.085]	0.842 [0.667 - 1.064]	0.911 [0.77 - 1.076]
More than high school	0.747*** [0.639 - 0.873]	0.659** [0.501 - 0.867]	0.808* [0.656 - 0.995]	0.652*** [0.511 - 0.831]	0.978 [0.768 - 1.247]
Family income to poverty ratio	0.876*** [0.839 - 0.914]	0.875*** [0.827 - 0.925]	0.89*** [0.832 - 0.952]	0.881*** [0.835 - 0.929]	0.868*** [0.805 - 0.934]
Unemployed (ref = have a job)	1.179** [1.05 - 1.322]	1.298** [1.097 - 1.536]	1.055 [0.9 - 1.236]	1.213* [1.035 - 1.422]	1.101 [0.932 - 1.3]
Any health insurance (ref = no insurance)	1.111 [0.983 - 1.255]	0.952 [0.762 - 1.189]	1.166* [1.002 - 1.356]	1.034 [0.849 - 1.259]	1.149 [0.981 - 1.345]
Female	1.149** [1.038 - 1.271]	0.995 [0.860 - 1.15]	1.32*** [1.146 - 1.52]	0.989 [0.862 - 1.135]	1.375*** [1.185 - 1.595]
Age (ref = 20-39)					

40-59	2.514*** [2.162 - 2.923]	2.402*** [1.928 - 2.992]	2.632*** [2.142 - 3.234]	2.314*** [1.894 - 2.828]	2.959*** [2.361 - 3.709]
60+	5.116*** [4.308 - 6.076]	4.229*** [3.352 - 5.335]	6.154*** [4.805 - 7.881]	4.084*** [3.283 - 5.081]	7.243*** [5.531 - 9.484]
Constant	2.312*** [1.842 - 2.904]	3.513*** [2.462 - 5.011]	1.598** [1.171 - 2.181]	3.268*** [2.355 - 4.537]	1.242 [0.807 - 1.912]
Inflation					
Age	0.334*** [0.268 - 0.417]	0.291*** [0.224 - 0.379]	0.405*** [0.28 - 0.585]	0.292*** [0.223 - 0.381]	0.46*** [0.318 - 0.665]
Foreign-born	0.788 [0.517 - 1.201]			0.929 [0.619 - 1.393]	0.474* [0.205 - 1.099]
Spanish	0.853 [0.554 - 1.313]	1.599 [0.789 - 3.238]	0.647 [0.387 - 1.082]		
Constant	2.976*** [1.994 - 4.441]	4.274*** [2.743 - 6.657]	1.731 [0.833 - 3.597]	3.934*** [2.537 - 6.099]	2.102 [0.658 - 6.711]
Inalpha	0.921 [0.795 - 1.065]	0.736** [0.597 - 0.908]	1.041 [0.85 - 1.274]	0.845 [0.696 - 1.027]	0.925 [0.748 - 1.145]
Observations	2,840	1,251	1,589	1,533	1,307
Log-likelihood	-5982	-2544	-3423	-3084	-2881
Chi-square	603.4	274.1	345.0	303.8	325.1

a. odds ratio and 95% CI in parentheses
Boxes indicate significant difference between groups
*** p<0.001, ** p<0.01, * p<0.05

Table 5. Cross-tabulation of nativity and language preference, Mexican Americans NHANES 2011-2020 (N= 2,840).

	US-Born	Foreign-Born	Total
English Preferred	1,177	74	1,251
Spanish Preferred	356	1,233	1,589
Total	1,533	1,307	2,840