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Racial/Ethnic Variations in Associations between Socio-economic Factors and Tooth Loss

Monik Jimenez, SM,
Harvard School of Public Health, Boston, U.S.A.

Harvard School of Dental Medicine, Boston, U.S.A.

Thomas Dietrich, DMD, MD, MPH,
Dept. of Oral Surgery, The School of Dentistry, University of Birmingham, Birmingham, UK

Mei-Chiung Shih, PhD,
Stanford University School of Medicine, Stanford, U.S.A

VA Cooperative Studies Program, Palo Alto, U.S.A.

Yi Li, PhD, and
Harvard School of Public Health, Boston, U.S.A.

Dana-Farber Cancer Institute, Boston, U.S.A.

Kaumudi J. Joshipura, ScD, BDS
University of Puerto Rico School of Dentistry, San Juan, U.S.A.

Harvard School of Public Health, Boston, U.S.A.

Harvard School of Dental Medicine, Boston, U.S.A.

Abstract

Objectives—To compare the associations between socio-economic factors and tooth loss among Whites, Blacks and Mexican-Americans.

Methods—Analyses were conducted on 16,821 adults, using data from the National Health and Nutrition Examination Survey-III. Age and multivariate adjusted negative binomial regression were used to explore the relation of socio-economic factors, region of residence, gender, and foreign-born with number of missing teeth. Effect modification by race/ethnicity was assessed by the inclusion of interaction terms.

Results—In multivariate adjusted analyses, non-Hispanic Whites with 9–12 years of education exhibited 71% higher mean number of missing teeth than those with >12 years (IRR=1.71, 95% CI: 1.52–1.92). Education was unrelated to number of teeth among non-Hispanic Blacks (IRR=1.16; 95% CI: 1.00–1.35) or Mexican-Americans (IRR=1.10, 95% CI: 0.93–1.31). The poorest Whites were missing 39% more teeth, on average, than the most affluent Whites, but no association between poverty and number of teeth was observed among Blacks or Mexican-Americans.

Conclusions—The associations between socio-economic factors and tooth loss vary across race/ethnicity. This suggests the health benefits associated with high SES are not equally shared across racial/ethnic groups.

Corresponding Author: Monik Jimenez, Oral Health Policy & Epidemiology, Harvard School of Dental Medicine, 188 Longwood Ave., Boston, MA 02115, monik_jimenez@hsdm.harvard.edu, Tel: 714-716-6096, Fax: 617-432-0047.

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Keywords

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INTRODUCTION

Tooth loss and edentulism have declined substantially in the U.S. over the past 30 to 40 years (1–4). Advances in oral health awareness, water fluoridation, and dental care (sealants) have all contributed to reductions in dental caries (5) and greater tooth retention in American society (2) with the greatest benefits among younger adults (6). Unfortunately, disadvantaged populations (such as, racial/ethnic minorities and low socio-economic status groups) still share a disproportionate burden of dental diseases, including but not limited to caries, periodontal disease, tooth loss and oral and pharyngeal cancers(4,7).

Missing teeth in adults can reflect tooth loss in adulthood or childhood from caries, periodontal disease and to a lesser extent from trauma, or extractions for orthodontic treatment or for prosthetic placements (2,4). Additionally, factors such as education, income, dental insurance, race/ethnicity, geographic location, health behaviors, oral hygiene, access to care, utilization patterns, and the ability to pay for costly dental procedures also influence decisions to extract teeth. The theory of “Embodiment” suggests that individuals physically manifest their social environment. These physical manifestations may be disease outcomes, or physical indicators of past exposure to social inequities which leave “permanent marks” on the physiology, function or anatomy of the individual (8,9). Tooth loss as a result of dental disease may express the embodiment of poor nutrition, limited disposable income, social norms, discrimination and dental disease through the life-course (10). Hence, the number of missing teeth may reflect the socio-economic circumstances of an individual over their lifetime.

Socio-economic status is comprised of many factors which may each play different roles at different times in an individual’s life in contributing to the risk of tooth loss. For example, low levels of maternal education may lead to poor oral hygiene in childhood and greater caries and tooth loss in late childhood and early adolescence (2,11,12) resulting in individuals entering adulthood with an already compromised dentition. Further tooth loss would be partly determined by oral hygiene, smoking status and dental care utilization in adulthood (13), behaviors likely to have been established in childhood.

Limited work has explored how the influence socio-economic indicators (SEI) on tooth loss may differ between sub-populations. While African Americans and Mexican-Americans are generally of lower SES than Whites, research has also shown that African Americans consistently earn less than their White counter-parts given the same level of education, with the greatest differences observed at the highest levels of education (14,15). In addition, some socio-economic factors which are important predictors of health in one segment of the population may not be important in other groups (16).

Our aim was to evaluate associations between factors related to socio-economic status and tooth loss within racial/ethnic groups. In addition, we explored whether the well established associations between low SES and tooth loss are similar for Whites, Blacks and Mexican-Americans.

METHODS

Analyses were conducted using data from the National Health and Nutrition Examination Survey III (NHANES III) collected from 1988 to 1994 (17–20). This survey utilized a complex sampling design conducted in 2 phases to provide a national probability sample of civilian, non-institutionalized individuals aged 2 months and older with oversampling of young children, the elderly, Blacks, and Mexican-Americans. Details of the sampling methods have been previously published (21). Survey and clinical oral examination data were available for 18,162 adult participants. These analyses were based on de-identified public-use data and hence were deemed exempt by the Committee on Human Studies at Harvard Medical School and Harvard School of Dental Medicine.

Number of missing teeth (0–28 teeth excluding third molars) was assessed by clinical oral examinations in a mobile examination center (MEC) and data on socio-economic variables were collected by interview. Only individuals who underwent both the interview and MEC exam were included in these analyses. Furthermore, participants less than 18 years of age or those missing any values for the tooth assessment were excluded.

Variables

These analyses utilized 8 socio-economic and related variables: education, poverty income ratio (PIR), occupation, dental insurance, dental care utilization, medical insurance, gender, region of residence and foreign-born. PIR is a ratio measure which accounts aspects of household composition and poverty threshold. PIR is a score based on a ratio, using reported household income in the numerator and poverty threshold, the age of the family reference person, and calendar year of interview in the denominator (18,20). PIR was used instead of income as it more adequately accounted for family characteristics than income alone. Missing data for the exposure variables were coded as missing, and analyses were run with the data available for each variable to maximize the power available for each analysis. Missing values for dental insurance were coded as a separate category to facilitate the use of this variable in spite of large amounts of missing data, since it was collected only in the second phase of the survey. Participants were considered edentulous if they were missing 28 teeth excluding third molars.

Race/ethnicity was assessed by self-report as non-Hispanic White, non-Hispanic Black, Mexican-American and Other. We will hence refer to non-Hispanic White and non-Hispanic Black as White and Black, respectively. Age was considered the major potential confounder and included in all analyses. Education was used as a 3 category variable based on the literature (16,22,23). PIR was categorized <1, 1–2, 2–3, 3–4 and >4, with lower PIR indicating a higher level of poverty. PIR in addition to non-ordinal categorical variables were modeled as dummy variables. For multi-category variables, the reference group was chosen as the category generally associated with the lowest risk of tooth loss.

Statistical Analyses

All analyses were carried out using STATA 9 (StataCorp, College Station, TX) and incorporated the clustering and stratified sampling design of the NHANES III survey.

The relationship of each socio-economic factor and number of missing teeth was modeled using negative binomial regression (24). Negative binomial regression models provide incidence rate ratios similar to Poisson regression and can be interpreted as a ratio of means. Negative binomial regression models were chosen due to failure to meet the necessary assumptions of Poisson regression models, namely due to evidence of overdispersion, exhibited by alpha parameters greater than 0 ($p<0.001$). The svy:nbreg command in STATA was used to fit the negative binomial regression models to survey data. The observed versus

fitted values for each model were graphed to assess model fit. The relation between each socio-economic factor and tooth loss was evaluated individually in age-adjusted models. In addition, all variables were simultaneously included in a multivariate model. To assess for the heterogeneous effects of socio-economic variables within sub-groups, race/ethnicity was evaluated as a potential effect modifier of all socio-economic factors. Estimates for each racial/ethnic group were calculated by introducing an interaction term into each age-adjusted and multivariate adjusted model. Comparisons were made within racial groups between individuals with different levels of the socio-economic indicators. Likelihood ratio tests were performed comparing a model with main effects only to a model with interaction terms to assess significance of the interaction. However, the magnitude of effect estimates were compared among racial/ethnic groups irrespective of evidence of significant interaction.

RESULTS

The characteristics of the study population are presented in Table 1. The mean age was approximately 47 years (s.d.= 20). Forty-percent were non-Hispanic White, 28% non-Hispanic Black and 27% Mexican-American. Overall, a higher proportion of Whites had more than 12 years of education, comprised the affluent categories of PIR and reported utilizing dental care services at least once a year, compared to Blacks or Mexican-Americans. Mexican-Americans were the least educated with 45% reporting ≤ 8 years of education.

Twelve percent of adults were edentulous, with the highest percentage (18%) among Whites and the lowest (5%) among Mexican Americans. The mean age among edentulous participants was 70 years with Blacks being slightly younger (67 years). The highest percentage of edentulous Blacks and Mexican-Americans comprised the lowest PIR category representing the most severe level of poverty. Greater than 40% of edentulous participants lived in southern US, with 57% of edentulous Blacks residents of the southern US.

Table 2 shows the association between SES and number of missing teeth separately for each racial/ethnic group. The incidence rate ratio (IRR) estimates can be interpreted as the ratio of the mean number of missing teeth of a category compared to the reference group adjusted for age (and other socio-economic factors for multivariate models) (25). In the age adjusted analyses, there were substantial differences across racial/ethnic groups in the association between all socio-economic and related factors and mean number of missing teeth, except dental insurance. Among Whites, the mean number of missing teeth for those with 9–12 years of education was 92% higher than those with >12 years, and 104% higher ≤8 years of education compared to >12 years. However, the association between education and mean number of missing teeth was much weaker for Blacks and Mexican-Americans.

PIR displayed a linear trend with mean number of missing teeth; increasing mean number of missing teeth with increasing level of poverty (p-value for trend<0.001). Among White, blue collar occupations were associated with missing nearly double the mean number of teeth as compared to white collar occupations. The observed association for Blacks in blue collar categories compared to white collar professions was much smaller and no significant associations were observed among Mexican-Americans. Dental care utilization exhibited a strong positive associations among Whites and weaker associations among Blacks and Mexican-Americans. With respect to foreign birth, foreign-born Blacks exhibited a 23% lower mean number of missing teeth compared to U.S. born Blacks.

In multivariate analyses there were substantial variations in the parameter estimates for socio-economic factors and tooth loss by race/ethnicity (Table 2). Overall, the estimates

were attenuated compared to the age adjusted models. Among Whites, low levels of education were significantly associated with a higher mean number of missing teeth compared to those with >12 years. However, for Blacks the associations were not significant and weaker than those observed among Whites. Among Mexican-Americans there were no significant associations observed with level of education.

Among Whites, in multivariate analyses PIR remained significantly associated with mean number of missing teeth, although attenuated (p-value for trend=0.006) compared to the age adjusted analyses. There was no association between categories of PIR and mean number of teeth among Blacks or Mexican-Americans (Figure 2). Female gender compared to male was associated with a higher mean number of missing teeth among Blacks and Mexican-Americans, but not among Whites.

Dental care utilization exhibited a strong significant association with mean number of missing teeth among Whites. Mexican-Americans who visited the dentist when needed exhibited a mean number of missing teeth 20% greater than those who visited at least once a year.

DISCUSSION

Our data suggest that the influences of socio-economic factors on tooth loss are heterogenous across race/ethnicity. Specifically, we found the associations between socio-economic factors and tooth loss were weaker for Blacks and Mexican-Americans than for Whites. Further, our data provide evidence to suggest that some commonly used indicators of SES may not be associated with tooth loss in some racial/ethnic populations, as has been suggested for other health outcomes (16,26,27). This may be due to historic inequities and/or population specific attributes, such as in immigrant populations. For example, among Whites, ≤8 years of education was associated with missing, on average, twice as many teeth (assuming other factors are the same) while education was not related with missing teeth among Blacks. Among Mexican-Americans, there was little variation in the number of missing teeth for any level of education in crude or multivariate adjusted analyses.

It is important to note some limitations of this study. Firstly, NHANES III is cross-sectional which limits causal interpretation due to inability to address temporality. Also, approximately 10% of observations were missing data on household income which was used to compute the PIR. This could induce a potential bias if the missingness was associated with income level and tooth loss. We could not assess whether missing data was associated with income since PIR is computed from the income variable itself. However, missingness was not related with tooth loss: approximately 9–12% of individuals in all categories of tooth loss were missing data on PIR. There were slightly greater proportions of Mexican-Americans (12%) and Blacks (8%) missing data on PIR compared to Whites (7%). But it is important to note that since the influence of PIR was estimated within race/ethnicity, bias would be introduced only if missing data on PIR was associated with level of missing teeth within each racial/ethnic category. In addition, dental insurance information was only available for 34% of participants because it was only assessed in phase II of the survey. However, each phase of the survey is considered a representative sample of the non-institutionalized U.S. civilian population. Therefore, estimates for the effect of dental insurance on tooth loss from phase II are an unbiased estimate of the effect of dental insurance on tooth loss for the combined NHANES surveys. Furthermore, the standard categorization utilized for occupational status does not distinguish between supervisory and non-supervisory positions within skill categories. Therefore, this classification does not account for control and decision latitude in the work place which has been shown to have important associations with health outcomes (16). The occupation variable assessed in the

NHANES III surveys did not accommodate unemployed sub-groups, such as retirees, homemakers, or students. The NHANES III groups these individuals with other unemployed persons with potentially fewer resources, which limited our ability to evaluate these groups separately. However, any potential bias from the categorization is likely to bias results towards the null.

Important strengths of this study include a large sample size which provided ample power to evaluate effect modification. In addition, the complex sampling design provided the opportunity to make comparisons among a wide range of socio-economic positions across a socially heterogeneous sample. The sampling design also resulted in data which can be generalized to the U.S. population of non-institutionalized civilians. In addition, the outcome and exposures were assessed by trained and calibrated examiners and survey administrators, in a well structured and standardized manner which minimizes bias due to misclassification.

In Figure 1 we propose a possible pathways that may likely explain the relation between socio-economic factors and tooth loss using PIR as the main exposure (28). This hypothetical model is presented as an aide in understanding the differences between the interpretations of the age adjusted versus multivariate adjusted results. In the age adjusted analysis the incidence rate ratios estimates reflect the overall effect of PIR on tooth loss. Thus, the age adjusted analysis as represented by the dotted line, exhibit the influence of PIR on tooth loss due to poverty directly and as well as indirectly through other dimensions of social status such as insurance and dental care utilization. The multivariate analysis reflects only the “direct” effect of PIR on tooth loss by conditioning on all other measured SES factors. Therefore, these estimates suggest the effect of poverty income ratio itself on tooth loss not mediated through other factors such as, education, occupation, medical insurance status, etc within each racial/ethnic group.

In stark contrast to the strong to moderate associations seen for Whites, we found surprisingly weak associations in multivariate analysis among Blacks and Mexican Americans for most socio-economic factors. For example, the association observed for PIR and mean number of missing teeth in multivariate analyses, was near null for all categories for both Blacks and Mexican-Americans (Figure 2). It should be noted that few Blacks and Mexican-Americans comprised the “most affluent” reference categories of PIR, education and occupation thereby potentially limiting power of multivariate estimates. Although, more importantly the multivariate analyses suggest that other factors irrespective of enabling factors such as income may play an important role in tooth loss among Blacks and Mexican-Americans plausibly cultural factors, such as social norms may influence the decision to extract (29–31). Other dimensions of social status not measured in this study may be more salient factors for these groups. Such factors may include disposable income, self-efficacy, or English fluency. Acculturation, roughly measured by foreign birth in some populations, may be one unmeasured factor potentially influencing tooth loss. We found that birth outside of U.S was associated with a lower mean number of missing teeth among Blacks. This may suggest either cultural differences in the decision to extract or less oral disease among foreign-born Blacks. The greatest numbers of foreign-born participants however were Mexican-American, and were substantially younger, poorer and less educated than Mexican-Americans born in the U.S. While the multivariate analyses were adjusted for foreign birth, due the heterogeneity among Mexican-Americans adjusting for foreign birth alone is unlikely to adequately control for confounding by diverse cultural and social factors associated with acculturation (31).

These data lend further support to the hypothesis that disparities in health due to socio-economic factors are not shared equally by all persons irrespective of race/ethnicity. Rather race/ethnicity is so inextricably tied to social status in the U.S. that a position of “affluent

and White" is not equal to "affluent and Black" or "affluent and Mexican-American". These data suggest that while the conventional associations of low levels of socio-economic status with tooth loss are maintained among White Americans the social factors driving tooth loss may be different for other racial/ethnic groups. Furthermore, characteristics of the dental practice utilized and discrimination may play an important role leading to tooth loss when individuals enter the dental care system (32). Little research has been done to explore the effect of cultural values on oral health or inequities in oral health care. Future studies are needed to explore the factors influencing the decision to extract, oral health awareness and potential discrimination in the dental practice. Research can be used to plan community interventions to effectively increase oral health awareness within specific racial/ethnic populations. Furthermore, cultural competency training should be further implemented in dental schools to equip dental professionals in educating diverse populations of patients about their treatment plan options and long term oral health.

These analyses suggest that socio-economic factors are strongly associated with tooth loss. However, there was no one factor, aside from dental care utilization, which exhibited a consistent relationship with tooth loss among all racial/ethnic groups. Dental care utilization should be interpreted with caution given the cross-sectional design of the study. We were unable to distinguish between participants who were missing teeth because they were sporadic users of dental care versus those who were sporadic users because they had few teeth. It is possible that tooth loss may be impacted by other difficult to measures social factors (for example, disposable income, cultural preferences or even discrimination) not evaluated in these analyses. As the American society increasingly becomes one of a minority majority, future studies should be developed to identify the salient social and cultural factors influencing oral health behaviors and disease in diverse racial/ethnic groups (33).

Conclusion

Commonly assessed socio-economic indicators may not be as strongly associated with tooth loss in ethnically diverse populations and the strength of the associations are not uniform across race/ethnicity. The association between number of missing teeth and socio-economic factors was attenuated among Blacks and Mexican-Americans compared to Whites in this study population. This suggests the health benefits associated with high SES are not equally shared by racial/ethnic groups.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1. Conceptual model for the association between socio-economic status and number of missing teeth (with PIR as the main exposure).

Age adjusted model represents the overall effect of PIR on tooth loss (represented by the dotted line) including the indirect effects of other socio-economic factors. The multivariate model for PIR represents the “independent” effect of PIR on tooth loss not mediated through measured socio-economic and related factors (race/ethnicity, age, education, occupational status, gender, dental insurance, dental care utilization, medical insurance, region of residence, and nativity).

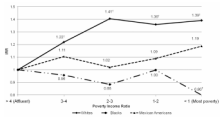

Figure 2. Multivariate* IRR of Mean Number of Missing Teeth by Poverty Income Ratio

* Adjusted for age, education, occupation, dental insurance, dental care utilization, medical insurance, gender, region of residence and foreign-born.

† p-value <0.05

Table 1

Demographic and Disease Characteristics of Study Population by Race/Ethnicity

Demographic Characteristic	Total	Whites	Blacks	Mexican Americans
% (N)	16,821	40% (6,793)	28% (4,752)	27% (4,599)
Mean Age (s.d.)	47 yr (20)	54 yrs (21)	43 yrs (18)	42 yrs (18)
Female Gender	53%	54%	55%	50%
Education (n=16,708)				
≤ 8 years	23%	14%	16%	45%
9–12 years	48%	49%	58%	40%
≥12 years	28%	37%	26%	15%
Poverty Income Ratio (n=15,234)				
>4 (Lowest poverty)	16%	28%	10%	7%
3–4	13%	18%	10%	8%
2–3	18%	21%	17%	14%
1–2	28%	23%	31%	33%
< 1 (Highest poverty)	24%	10%	32%	38%
Occupation (n=9,784)				
White Collar	44%	58%	41%	30%
Service Groups	19%	12%	25%	21%
Farm Workers	5%	4%	2%	9%
Blue Collar	32%	25%	32%	40%
Has Dental Insurance (n=5,666)	57%	46%	74%	60%
Has Medical Insurance (n=11,707)	90%	95%	87%	83%
Dental Care Utilization (n=16,021)				
Once a year	39%	50%	32%	29%
At least once every 2 yrs	4%	4%	3%	4%
When needed	55%	43%	64%	65%
Don’t go	2%	2%	1%	2%
Region of Residence (n=16,821)				
West	24%	16%	8%	51%
Midwest	19%	27%	20%	9%
Soutd	43%	39%	56%	39%
Nortdeast	14%	18%	17%	1%
Foreign-born[†] (n=16,779)	21%	5%	7%	50%
Number of Teeth				
>20	70%	63%	68%	83%

Demographic Characteristic	Total	Whites	Blacks	Mexican Americans
15–20	7%	7%	10%	6%
10–15	5%	5%	6%	3%
<10	6%	8%	7%	3%
Edentulous	12%	18%	10%	5%

† Other=Born in Mexico for Mexican Americans

Table 2

Age and Multivariate* Adjusted Estimates (IRR) Relating Mean Number of Missing Teeth and SES Variables By Race/Ethnicity

	Age Adjusted			SES Multivariate		
SES Variables	**Whites**	**Blacks**	**Mexican Americans**	**Whites**	**Blacks**	**Mexican Americans**
Education† ref=>12 yr	**1.92 (1.75, 2.11)**	**1.32 (1.18, 1.47)**	**1.16 (1.02, 1.33)**	n=3,254	n=2,209	n= 1,562
9–12 yrs				**1.71 (1.52, 1.92)**	1.16 (1.00, 1.35)	1.10 (0.93, 1.31)
≤8 yrs	**2.04 (1.80, 2.30)**	**1.20 (1.09, 1.33)**	**1.23 (1.06, 1.44)**	**1.78 (1.49, 2.14)**	1.09 (0.92, 1.30)	1.15 (0.93, 1.43)
Poverty Income Ratio † ref=>4 Least poverty)						
3–4	**1.39 (1.24, 1.57)**	1.18 (0.99, 1.40)	1.14 (0.95, 1.36)	**1.22 (1.09, 1.36)**	0.96 (0.80, 1.15)	1.11 (0.88, 1.39)
2–3	**1.65 (1.48, 1.83)**	**1.16 (1.01, 1.33)**	**1.24 (1.03, 1.50)**	**1.41 (1.19, 1.66)**	0.88 (0.75, 1.04)	1.02 (0.79, 1.32)
1–2	**1.71 (1.58, 1.85)**	**1.27 (1.13, 1.44)**	**1.39 (1.22, 1.58)**	**1.36 (1.12, 1.64)**	1.00 (0.84, 1.18)	1.09 (0.88, 1.35)
≤ 1 (Most poverty)	**2.13 (1.90, 2.39)**	**1.27 (1.15, 1.41)**	**1.44 (1.26, 1.65)**	**1.39 (1.07, 1.80)**	**0.80 (0.66, 0.96)**	1.19 (0.88, 1.61)
Occupation† ref=White Collar Workers						
Service Groups	**1.59 (1.06, 1.45)**	**1.19 (1.10, 1.28)**	1.10 (0.94, 1.30)	1.24 (0.97, 1.35)	1.03 (0.94, 1.13)	1.08 (0.82, 1.42)
Farm Workers	1.16 (0.77, 1.75)	0.97 (0.74, 1.28)	0.83 (0.69, 0.99)	0.82 (0.57, 1.19)	0.93 (0.62, 1.37)	1.05 (0.81, 1.36)
Blue Collar Workers	**1.93 (1.70, 2.18)**	**1.21 (1.08, 1.37)**	1.10 (0.96, 1.25)	**1.51 (1.37, 1.67)**	1.08 (0.97, 1.20)	1.03 (0.85, 1.25)
Female Gender†	0.97 (0.91, 1.04)	**1.19 (1.10, 1.27)**	**1.32 (1.25, 1.40)**	1.09 (0.99, 1.19)	**1.29 (1.16, 1.43)**	**1.26 (1.10, 1.46)**
Dental Insurance ref=Ins.	1.03 (0.91, 1.17)	1.07 (0.97, 1.18)	1.13 (0.96, 1.33)	1.07 (0.92, 1.25)	0.93 (0.82, 1.06)	1.01 (0.86, 1.19)
Dental Care Utilization† ref=at least once a yr						
every 2 yrs	**1.47 (1.25, 1.74)**	0.94 (0.73, 1.19)	0.98 (0.83, 1.16)	1.19 (0.95, 1.49)	0.94 (0.73, 1.21)	1.03 (0.80, 1.32)
when needed	**2.41 (2.22, 2.62)**	**1.19 (1.10, 1.28)**	**1.34 (1.26, 1.43)**	**2.20 (1.92, 2.52)**	1.09 (0.98, 1.21)	**1.20 (1.06, 1.36)**
other/doesn't go	**2.99 (2.61, 3.43)**	1.18 (0.94, 1.47)	**1.61 (1.23, 2.13)**	**3.73 (2.67, 5.19)**	1.31 (0.75, 2.29)	1.00 (0.55, 1.82)
Medical Insurance ref= Ins.	**1.32 (1.15, 1.51)**	0.96 (0.86, 1.08)	1.04 (0.91, 1.20)	0.89 (0.72, 1.10)	**0.70 (0.57, 0.86)**	**0.79 (0.64, 0.97)**

	Age Adjusted			SES Multivariate		
SES Variables	**Whites**	**Blacks**	**Mexican Americans**	**Whites**	**Blacks**	**Mexican Americans**
Region[†] ref=West Midwest	**1.38 (1.11, 1.70)**	1.09 (0.86, 1.38)	0.96 (0.81, 1.13)	1.20 (0.96, 1.50)	1.04 (0.78, 1.39)	1.08 (0.78, 1.48)
South	**1.46 (1.16, 1.84)**	1.18 (0.96, 1.46)	1.08 (0.99, 1.17)	1.22 (0.98, 1.50)	1.13 (0.88, 1.45)	1.10 (0.95, 1.27)
Northeast	**1.57 (1.27, 1.94)**	1.03 (0.83, 1.28)	1.24 (0.89, 1.72)	**1.37 (1.13, 1.66)**	0.92 (0.71, 1.18)	1.96 (0.97, 3.97)
Foreign-born[‡] ref=U.S.		**0.77 (0.65, 0.91)**	0.97 (0.90, 1.04)			

Bolded estimates and 95% CI indicate significance at p<0.05

[*] Adjusted for age and all other variable listed in this table.

[†] Interaction between factor and race/ethnicity significant at p<0.05