

BRIEF COMMUNICATION

Dental visits among adult Hispanics – BRFSS 1999 and 2006

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Keywords

Hispanic Americans; adults; dental care; healthcare surveys; population surveillance.

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Received: 11/18/2009; accepted: 03/11/2011.

doi: 10.1111/j.1752-7325.2011.00259.x

Introduction

Ethnic and racial minority population groups, such as Hispanics, are less likely to use dental services yet bear a disproportionate burden of oral disease and disability (1-3). For example, Hispanic adults are more likely to experience untreated dental decay and periodontal disease and less likely to use dental services compared with non-Hispanic whites (1,3). The 2000 Surgeon General's Report on Oral Health in America states the majority of oral diseases and conditions are still more prevalent in certain subpopulations such as Hispanics (4). The last report of dental visits among Hispanic adults and children in the United States comparing National Health Interview Survey data for 1987 through 1999 reported some increase in utilization of dental services during that period, although the level was still below the national average (3). The Behavioral Risk Factor Surveillance System (BRFSS)

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Abstract

Objectives: This study examined and compared utilization of dental services by adult US Hispanics 18 years and older in the years 1999 and 2006.

Methods: Dental utilization data collected by telephone interviews by the state-based Behavioral Risk Factor Surveillance System (BRFSS) were analyzed.

Results: In 2006, the state mean and median prevalence of adult Hispanics with dental visits during the past year were 56.2 percent and 62.1 percent, respectively, and had not changed significantly since 1999. In 40 states, utilization was well below the national prevalence of 70.3 percent. Frequency of dental visits was significantly higher among females and those with higher income (>\$50,000), higher education, nonsmokers, and persons having medical health insurance.

Conclusions: Findings from this study suggest that barriers to utilization of dental services among Hispanic adults exist in most states and may contribute to existing oral health disparities. The magnitude of this problem may increase in the future with the expansion of the US Hispanic population.

is a state-based telephone survey of major health risk behaviors, use of preventive health practices, and access to health care. BRFSS is conducted among a representative, random sample of all non-institutionalized adults 18 years and older living in the United States and its territories (5). Recently, it was reported from analyses of BRFSS 2008 data that one-third of the population without medical insurance was Hispanic and that Hispanics were over four times more likely to be uninsured than non-Hispanic whites (6).

The purpose of this study was to present and compare utilization rates – by state and by various demographic and behavioral factors – for dental visits by Hispanic adults in 1999 and 2006 via analyzing BRFSS data sets. The aim was to assess whether any change in Hispanics' dental care utilization rates had occurred between both years.

Methods

In both BRFSS surveys, 1 of 3 oral health-related questions asked of all participants was: "How long has it been since you

last visited a dentist or a dental clinic for any reason?" Responses were categorized by respondents as: 1-12 months, 1-2 years, 2-5 years, more than 5 years, and never. Individuals who responded "1-12 months" were regarded as having been to the dentist in the last year, and the remaining categories were collapsed for the purpose of analysis. In both years, Hispanics were identified as persons who reported Spanish or Hispanic heritage. In 1999 and 2006, totals of 13,372 and 19,520 Hispanics responded to the surveys, but approximately 3 percent and 1 percent, respectively, provided no information on the dental visits. To allow direct comparison among states (Table 1), all state estimates were age-standardized to the 2000 US adult population (7). However, actual non-standardized sample sizes were used in all calculations pertaining to examining predictors of dental visits (Table 2). Multivariable logistic analyses were conducted and odds ratios (OR) were reported along with their 95% confidence intervals (CI). Statistically significant differences in utilization rates between 1999 and 2006 were assessed by there being no overlap in the 95% CI when comparing the 2 years. The statistical software package SAS-callable SUDAAN (Version 9.1, SAS Institute, Inc. Cary, NC) was used to analyze these BRFSS data while accounting for the complex sampling design. In the 1999 and 2006 BRFSS, the median cooperation rates were 56.7 percent and 74.5 percent, and Council of American Survey Research Organization (CASRO) rates were 56.2 percent and 51.4 percent, respectively.

Results

Table 1 displays the age-standardized findings by state in 1999 and 2006. In 2006, mean prevalence of Hispanic adults with dental visits during the preceding year for all states was 56.2 percent (95% CI = 54.6-57.7) and the median 62.1 percent with a range from 40.7 percent in Arkansas to 78.6 percent in West Virginia. Seven years earlier, the corresponding mean among all states and Puerto Rico was 58.4 percent (95% CI = 56.8-60.1) and the median 62.2 percent with a range from 44.6 percent in Ohio to 78.4 percent in Nebraska. Significant increases from 1999 to 2006 in dental care utilization among Hispanics were seen only in West Virginia (+33.0 percent) and Ohio (+24.7 percent), and significant decreases in North Carolina (-26.1 percent), Nebraska (-22.3 percent), Illinois (-18.9 percent), and Washington State (-16 percent).

The actual (unadjusted) numbers of respondents in the different categories are displayed in the first column of Table 2, followed by the percentages of respondents in the various groups in the next two columns, illustrating the distributions of respondents regarding the demographic factors age, sex, marital status, education, annual household income, smoking, and medical insurance coverage. For instance, 54.4 percent of those lacking dental visits the last year were men, and 44.1 percent had not completed high school level educa-

tion. The rightmost four columns display the ORs with their corresponding 95% CI, namely crude ORs and ORs adjusted for all remaining variables in the table, respectively. People with annual household incomes of less than \$25,000 were only about one-third as likely to have seen a dentist the last year as those living in households with incomes of \$50,000 or more. People with medical insurance coverage were 2.8 times more likely to have had a dental visit the last year than those without such insurance.

Discussion

Overall, the BRFSS estimate in 2006 for Hispanic adults having had dental visits in the preceding 12-month period had not changed significantly from 1999. The 2006 median for dental visits among Hispanic adults for all states was still well below the median of 70.3 percent for dental visits in the preceding year for the total US population (5). Only seven states had higher prevalence among Hispanics than this national median. Also, prevalence in Hispanic dental visits had not changed significantly during the 7-year period from 1999 to 2006 in most states, with the exception of increases in two states and decreases in four states.

About half of Hispanics without a dental visit the last 12 months had medical health insurance. It is common for individuals with medical insurance not to have dental insurance, as American adults are more likely to have medical insurance than dental insurance. However, the likelihood of obtaining a dental visit is not only influenced by having medical or dental health insurance coverage (8) and by the type of service sought/needed (preventive, restorative, or urgent/emergency dental services) but could also be related to having access to dental services. Whereas this descriptive study was not designed to further explore potential reasons for lack of utilization of dental care services among US Hispanics, a workshop was convened in 2004 by the Hispanic Dental Association and the University of Puerto Rico School of Dentistry to discuss oral health care among Hispanics. The workshop participants recommended further studies being conducted to examine the current state of Hispanic-focused oral health research and to identify and understand factors that may influence oral health status and dental care utilization among this population group (9).

The findings of this study are subject to several *limitations*. First, this study did not stratify Hispanic populations by ethnic subgroups, and therefore does not reflect possible differences in their cultural, behavioral, and social characteristics relevant to healthcare attitude and behavior. Second, the BRFSS sample was drawn from the non-institutionalized population, which excludes Hispanic populations not residing in households. Third, the survey excluded persons without residential telephone services, such as the illegal migrant population and populations with very low incomes,

Table 1 Proportion of US Hispanic Adults Having Had at Least One Dental Visit in the Preceding 12 Months in 1999 and 2006 by State/Territory – Behavioral Risk Factor Surveillance System (BRFSS)

State/territory	1999				2006				Change in estimates from 1999 to 2006§
	Sample size (n)	%*	SE†	95% CI‡ (%)	Sample Size	%	SE	95% CI (%)	
Alabama	40	71.3	6.8	57.9-84.6	59	64.5	6.8	51.1-77.8	-6.7
Alaska	71	62.3	7.3	47.9-76.7	75	70.9	6.3	58.4-83.3	8.5
Arizona	304	48.4	4.0	40.5-56.3	1,073	54.7	3.1	48.6-60.9	6.3
Arkansas	69	50.4	6.8	37.1-63.8	172	40.7	4.1	32.6-48.7	-9.7
California	1,049	57.4	1.9	53.5-61.2	1,320	55.1	1.8	51.6-58.6	-2.2
Colorado	339	47.9	3.4	41.1-54.7	734	52.5	2.1	48.3-56.6	4.6
Connecticut	305	60.3	4.0	52.4-68.2	692	66.2	2.3	61.5-70.9	5.9
Delaware	78	62.3	6.5	49.5-75.1	87	61.0	6.5	48.2-73.8	-1.2
District of Columbia	45	74.0	5.0	64.2-83.9	144	65.7	4.2	57.3-74.1	-8.3
Florida	702	61.0	2.2	56.6-65.5	1357	59.1	1.7	55.6-62.5	-1.9
Georgia	55	70.6	6.3	58.1-83.1	189	66.3	4.1	58.1-74.5	-4.3
Hawaii	215	74.8	3.8	67.3-82.3	425	62.9	3.3	56.3-69.5	-11.9
Idaho	232	58.9	4.4	50.2-67.5	295	48.4	3.8	40.8-55.9	-10.5
Illinois	121	71.7	5.4	61.0-82.4	314	52.8	3.5	45.8-59.7	-18.9
Indiana	53	60.2	7.0	46.4-74.0	227	51.7	4.0	43.7-59.6	-8.5
Iowa	60	66.8	6.1	54.8-78.8	131	56.2	5.2	45.9-66.4	-10.6
Kansas	186	62.1	4.6	53.0-71.2	410	53.0	2.8	47.5-58.5	-9.1
Kentucky	67	67.8	6.2	55.6-80.0	59	62.7	6.7	49.5-75.9	-5.1
Louisiana	73	69.3	5.3	58.9-79.7	210	66.8	3.8	59.3-74.2	-2.5
Maine	42	62.5	7.3	48.0-77.0	28	74.2	8.1	58.3-90.1	11.7
Maryland	122	67.5	5.9	55.8-79.2	185	71.9	3.9	64.2-79.5	4.3
Massachusetts	426	65.8	3.4	59.1-72.5	1181	63.5	2.3	58.9-68.0	-2.3
Michigan	73	76.7	5.0	66.9-86.5	110	75.4	4.1	67.3-83.5	-1.2
Minnesota	123	76.3	3.8	68.7-83.9	72	77.0	5.1	66.9-87.1	0.7
Mississippi	43	55.5	7.7	40.3-70.8	88	61.6	5.6	50.5-72.8	6.1
Missouri	92	46.1	6.1	34.0-58.2	94	40.7	6.7	27.5-53.9	-5.3
Montana	42	52.5	9.0	34.7-70.3	109	56.0	5.7	44.8-67.2	3.5
Nebraska	90	78.4	4.5	69.4-87.4	348	56.1	3.7	48.8-63.4	-22.3
Nevada	251	51.9	4.6	42.8-61.0	482	53.8	3.1	47.7-60.0	1.9
New Hampshire	41	48.2	7.0	34.3-62.0	55	64.6	6.5	51.7-77.4	16.4
New Jersey	299	59.9	3.6	52.8-67.0	1,248	61.5	1.8	57.8-65.1	1.5
New Mexico	1,289	56.9	1.5	53.9-60.0	2,160	56.7	1.4	54.0-59.5	-0.2
New York	318	65.7	3.5	58.8-72.5	488	61.3	2.6	56.2-66.5	-4.3
North Carolina	56	71.3	6.9	57.6-85.0	800	45.2	2.6	40.1-50.4	-26.1
North Dakota	22	58.9	11.7	35.8-82.0	53	76.2	6.6	63.2-89.3	17.3
Ohio	30	44.6	4.8	35.2-54.0	128	69.3	5.2	59.0-79.7	24.7
Oklahoma	119	59.8	6.1	47.8-71.8	344	49.7	3.4	43.0-56.5	-10.1
Oregon	108	55.3	5.8	43.8-66.8	203	57.2	4.1	49.0-65.4	1.9
Pennsylvania	74	74.6	5.9	62.9-83.6	252	74.6	4.3	66.0-83.2	0.1
Rhode Island	235	67.7	4.0	59.8-75.5	342	65.0	3.1	58.8-71.2	-2.6
South Carolina	92	55.9	6.6	42.9-68.9	176	59.0	4.4	50.2-67.8	3.1
South Dakota	61	59.6	5.9	48.0-71.2	65	73.1	5.4	62.5-83.7	13.5
Tennessee	44	52.8	6.8	39.5-66.2	56	66.5	7.3	52.1-80.8	13.6
Texas	1,188	45.0	2.0	41.0-48.9	1,649	49.7	1.9	45.9-53.6	4.7
Utah	159	62.9	5.0	53.0-72.7	375	54.2	3.5	47.2-61.3	-8.6
Vermont	52	70.8	6.7	57.6-84.1	89	67.1	5.3	56.6-77.5	-3.7
Virginia	117	71.1	5.2	60.8-81.5	152	68.7	4.4	60.1-77.3	-2.4
Washington	169	70.4	4.0	62.3-78.4	1,315	54.3	1.9	50.5-58.2	-16.1
West Virginia	42	45.6	7.7	30.5-60.8	41	78.6	5.9	67.0-90.2	33.0
Wisconsin	45	72.1	7.7	56.9-87.2	82	65.6	6.8	52.1-79.0	-6.4
Wyoming	134	61.8	4.5	52.8-70.8	241	62.5	3.5	55.5-69.4	0.6
Puerto Rico	2,877	68.7	0.9	66.7-70.6	4,546	70.7	0.8	69.2-72.3	2.0
Total	12,939	58.4	0.8	56.8-60.1	25,530	56.2	0.7	54.6-57.7	-2.2
Median		62.2				62.1			

Interpret cell sample sizes with $n < 40$ with caution.

* Age-standardized to the 2000 US standard adult population (8).

† SE, standard error.

‡ 95% CI, 95% confidence interval.

§ **Bold figures** represent significant changes from 1999 to 2006; regular font figures are increases, and italicized figures with a preceding minus indicate decreases.

Table 2 Associations of US Hispanic Adults by Dental Visits During the Last 12 Months and Selected Demographic Characteristics for All of Which the Multivariable Logistic Analyses were Controlled – BRFSS 2006

	Sample size (n*)	With dental visits (%)	Without dental visits (%)	Crude OR (95% CI)†	P-value	Adjusted‡ OR (95% CI)	P-value§
Age group (n = 19,391)							
18-24	1,891	19.2	21.2	0.99 (0.88-1.11)	0.86	0.94 (0.68-1.38)	0.26
25-34	4,420	25.4	28.3	0.98 (0.88-1.10)	0.72	0.88 (0.66-1.16)	
35-44	4,530	23.1	20.1	1.26 (1.12-1.41)	<0.001	1.10 (0.83-1.45)	
45-64	5,987	24.4	21.9	1.22 (1.09-1.36)	<0.001	1.00 (0.77-1.30)	
65+	2,563	7.9	8.7	Referent group			
Sex (n = 19,520)							
Male	7,231	46.8	54.4	0.74 (0.70-0.78)	<0.001	0.75 (0.65-0.87)	<0.001¶
Female	12,289	53.2	45.6	Referent group			
Marital status (n = 19,447)							
Married	10,217	56.4	50.6	1.72 (1.56-1.89)	<0.001	1.15 (0.88-1.52)	0.65
Divorced	2,359	7.1	6.6	0.56 (0.55-0.58)	<0.001	1.13 (0.81-1.56)	
Widowed	1,342	3.2	3.8	1.27 (1.06-1.51)	0.007	0.89 (0.59-1.34)	
Separated	1,069	4.0	5.5	1.12 (0.96-1.31)	0.15	1.09 (0.71-1.69)	
Never married	3,068	21.2	20.9	1.57 (1.41-1.74)	<0.001	1.15 (0.83-1.58)	
Unmarried couple	1,392	8.2	12.6	Referent group			
Education (n = 19,416)							
Less than high school	6,160	26.4	44.1	0.37 (0.35-0.40)	<0.001	0.62 (0.49-0.80)	<0.001¶
High school	5,832	29.5	28.5	0.64 (0.60-0.69)	<0.001	0.81 (0.64-1.02)	
More than high school	7,424	44.1	27.4	Referent group			
Annual household income (n = 16,531)							
<\$15,000	3,510	19.0	28.5	0.29 (0.26-0.32)	<0.001	0.44 (0.33-0.57)	<0.001¶
≥\$15,000 to <\$25,000	4,725	24.8	33.7	0.32 (0.29-0.35)	<0.001	0.47 (0.37-0.59)	
≥\$25,000 to <\$35,000	2,424	14.2	15.0	0.41 (0.37-0.46)	<0.001	0.57 (0.44-0.75)	
≥\$35,000 to <\$50,000	2,108	13.4	10.4	0.56 (0.51-0.63)	<0.001	0.63 (0.50-0.81)	
≥\$50,000	3,764	28.5	12.4	Referent group			
Smoking status (n = 19,422)							
Current (everyday)	2,122	7.9	10.0	0.74 (0.67-0.82)	<0.001	0.54 (0.66-1.08)	0.32
Current (some days)	1,327	7.1	8.6	0.77 (0.69-0.86)	<0.001	0.91 (0.67-1.24)	
Former smoker	3,731	16.9	17.3	0.92 (0.85-0.99)	<0.001	0.86 (0.71-1.04)	
Never smoker	12,242	68.2	64.1	Referent group			
Medical health insurance (n = 19,434)							
Yes	13,284	74.6	51.5	2.77 (2.61-2.95)	<0.001	2.12 (1.79-2.51)	<0.001¶
No	6,150	25.4	48.5	Referent group			

* Actual sample size, not age-standardized.

† 95% CI = 95% confidence interval.

‡ Adjusted for all other variables displayed in Table 2.

§ "¶" Indicate significant changes from 1999 to 2006.

OR, odds ratio.

or those residing in households exclusively using cellular phones. Fourth, the accuracy of participant self-report of dental visit in the last 12 months was not validated against dental records, so responses may be subject to recall bias or the tendency to give socially desirable responses during interviews. Finally, the BRFSS consists of a one-time interview without any follow-up and is thus dependent on self-report without verification of any responses. Consequently, estimates from this report cannot be compared directly with the Healthy People 2010 objective (10) because that was set to baseline data from the 1996 Medical Expenditure Panel

Survey, which queries study participants several times during the year and may confirm self-reported care services utilization with bills or records.

In conclusion, the results from this study support existing evidence of oral health disparities to suggest a need for initiatives to reduce barriers to dental care utilization among Hispanic adults in the United States. Provision of dental services for Hispanics presents a major public health issue that will increase in the future, as 133 million Hispanics are projected to encompass 30 percent of the US population by the year 2050 (11) versus 45 million (15 percent) in 2006 (12). In light

of the mounting evidence for associations between oral and general health, it is more important than ever before to provide dental services to the rapidly growing US subpopulation of Hispanic ethnicity to attain good health.

References

1. Manski RJ, Magder LS. Demographic and socioeconomic predictors of dental care utilization. *J Am Dent Assoc.* 1998;**129**(2):195-200.
2. Stewart DC, Ortega AN, Dausey D, Rosenheck R. Oral health and use of dental services among Hispanics. *J Public Health Dent.* 2002;**62**(2):84-91.
3. Wall TP, Brown LJ. Dental visits among Hispanics in the United States, 1999. *J Am Dent Assoc.* 2004;**135**(7):1011-7. quiz 36-8.
4. U.S. Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Dental and Craniofacial Research; 2000. [cited 6 May 2011] Available from <http://www.nidcr.nih.gov/DataStatistics/SurgeonGeneral/>.
5. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System. Atlanta, GA: US Department of Health and Human Services, CDC; 2010. [cited 6 May 2011] Available from <http://www.cdc.gov/brfss>.
6. Patel N, Bae S, Singh KP. Association between utilization of preventive services and health insurance status: findings from the 2008 Behavioral Risk Factor Surveillance System. *Ethn Dis.* 2010;**20**(2):142-7.
7. Klein RJ, Schoenborn CA. Age adjustment using the 2000 projected U.S. population. *Healthy People 2010 Stat Notes.* 2001;**Jan**(20):1-10.
8. Manski RJ, Cooper PF. Dental care use: does dental insurance truly make a difference in the US? *Community Dent Health.* 2007;**24**(4):205-12.
9. Ramos-Gomez F, Cruz GD, Watson MR, Canto MT, Boneta AE. Latino oral health: a research agenda toward eliminating oral health disparities. *J Am Dent Assoc.* 2005;**136**(9):1231-40.
10. U.S. Department of Health and Human Services. Healthy People 2010-midcourse review. Washington, D.C.: U.S. Department of Health and Human Services; 2005. [cited 6 May 2011] Available from <http://www.healthypeople.gov/2010/Data/midcourse/>.
11. U.S. Census Bureau News. An older and more diverse nation by midcentury. 2008. [updated 14 August 2008; cited 6 May 2011] Available from <http://www.census.gov/newsroom/releases/archives/population/cb08-123.html>.
12. U.S. Census Bureau. HIA-1. Health insurance coverage status and type of coverage – all persons by sex, race and Hispanic origin: 1999 to 2009. 2008. [updated 16 September 2010; cited 6 May 2011] Available from <http://www.census.gov/hhes/www/hlthins/data/historical/index.html>.