Community Dental Health (2013) **30,** 161–167
Received 20 September 2012; Accepted December 2012

doi:10.1922/CDH_3096Christian07

Oral health care services utilisation in the adult US population: Medical Expenditure Panel Survey 2006

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Objectives: To estimate the proportion of dental visits and to explore determinants of oral health care service (OHCS) utilisation among US civilian non-institutionalised adults. ***Methods:*** Cross-sectional data from the 2006 Medical Expenditure Panel Survey (MEPS) were used to analyse adults' self-reported dental visits across potential risk factors (n=22,721). MEPS uses a complex sample design including stratification, clustering, multiple stages of selection, and disproportionate sampling. These survey design complexities were taken into account for analysis in this study. The analysis was performed in SAS 9.2 and used chi-square tests and binary logistic regression. ***Results:*** MEPS (2006) represented approximately 222 million non-institutionalised US adults. 42% (weighted) of this population reported a dental visit in the past 12 months. Dental visit numbers were observed to increase with age, with the 55-64-year-olds approximately 44% more likely than the 18-24-year olds to have visited the dentist in the past year. Hispanics were 48% less likely to report a dental visit compared to Non-Hispanic Whites. Respondents with public- or no- dental insurance were less likely to report a dental visit than persons with private dental coverage. ***Conclusions:*** Under half the US adult civilian non-institutionalised population reported a dental visit during 2006. To help address utilisation disparities, creative initiatives and systemic approaches aimed at groups currently utilising OHCS less often could be an important step towards oral health equity.

Key words: *health services research, utilization, dental health services, epidemiologic factors, healthcare disparities.*

Introduction

Dental diseases such as caries and periodontal diseases are common, cumulative, progress slowly, and turn symptomatic when operative treatment may become inevitable. Such late intervention may lead to stress and burden on the individual, the health system and the community, negatively impacting people's well-being and quality of life (Cunnion *et al.,* 2010; Locker and Miller, 1994; Reisine and Locker, 1995). A recent study of early childhood caries (ECC) demonstrated that children with ECC were more likely to have worse quality of life scores and experience negative impacts on physical, mental and social functioning than caries-free children (Cunnion *et al.,* 2010). Prevention and early diagnosis can dramatically reduce the negative outcomes of oral diseases. Furthermore, timely and appropriate utilisation of oral healthcare service (OHCS) impacts prevention and treatment of oral diseases.

OHCS utilisation is frequently measured either as the number of visits for dental care per person or as the proportion of persons visiting a dentist, within a year (Manski and Brown, 2007; Petersen and Holst, 1995). Although such measurements frequently exclude other health care providers that may be sought for oral care e.g. physicians, it still serves as a reasonable marker of an individual's or population's ability to seek oral health care and maintain oral health (US Department of Health and Human Services, 2000). Because OHCS provided by non-dental professionals are minimal for adults, dental visits are considered to be an accurate measure for OHCS utilisation. In order to develop, implement and sustain effective OHCS it is necessary to identify those factors which act as facilitators or barriers to utilisation. The principal reasons for non-utilisation of oral health care services are the perception of not having a dental problem, the cost of care, fear, being edentulous, and having problems accessing the system. The perception of not having a dental problem as a reason for not visiting the dentist was reported by almost half of persons in the US with no dental visit (US Department of Health and Human Services, 2000). This highlights poor awareness about the importance of periodic dental visits for prevention, early detection and most efficient treatment planning purposes. However, it is also possible that someone under the care of a dentist may have been given a recall interval of more than one year, particularly since the routine six month recall is being replaced by a risk-based recall process. In such cases, the perception of not having a dental problem may be perfectly valid and individuals with a longer recall interval may also choose to answer yes to the perception of not having a dental problem, thus biasing the data.

Numerous studies document differences in OHCS utilisation by age, sex, race/ethnicity, education, income, geographic location and insurance status (Aday and Forthofer, 1992; Davidson and Andersen, 1997; Gift and Newman, 1992, 1993; Manski and Cooper, 2007;

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Manski *et al.,* 2001a; Vargas and Manski, 1999). Racial/ethnic minority adults are reported to have fewer dental visits in the past year compared to Non-Hispanic White adults. Characteristics associated with disparities in OHCS utilisation, i.e. the lesser utilisation by minority groups, includes: being male, belonging to larger families, being unemployed or in blue-collar jobs, perceiving one's general health to be fair or poor, and having no private dental insurance (Aday and Forthofer, 1992). Factors consistently identified as independent predictors of non-utilisation of OHCS include, belonging to the lower socio-economic strata, being African American, children in pre-school and the elderly, and having no dental insurance coverage (Petersen and Holst, 1995). Differences in OHCS utilisation by income have been long recognised e.g. lower utilisation of OHCS by low income American families (Gift and Newman, 1992, 1993). Manski and Brown (2007) reported that in 2004 more Americans with private dental insurance (57%) visited a dentist than to Americans with public (32%) or no dental insurance (27%). In the same report approximately 60% of subjects aged 21-64 were covered by private dental insurance.

The historically observed differences in OHCS utilisation in the US population reflect complex interactive, individual, community, cultural and societal level factors which may contribute to inequalities in health. Hence, achieving equity in utilisation of OHCS will require multi-pronged collaborative initiatives (Somkotra and Detsomboonrat, 2009). A good understanding of the factors which facilitate or impede OHCS utilisation is necessary to plan and develop effective, equitable and appropriate health services and policies. The purpose of this study is to augment existing research by providing more current information regarding the extent to which adults in the US utilised the oral health care delivery system in 2006 by estimating the proportion of self-reported dental visits for 2006, and analysing OHCS utilisation by demographic and socio-economic factors.

Material and methods

We analysed data from the Medical Expenditure Panel Survey (MEPS) which was designed to produce unbiased nationally representative estimates of health care utilisation, expenditure, sources of payment and health insurance coverage for the 2006 US civilian non-institutionalised population. Some 34,145 persons completed the survey of which 32,577 were assigned a positive person level weight for a response rate of 58.3% (Center for Financing Access and Cost Trends, 2008). This analysis focused only on adults aged over 17 with an unweighted sample size of 22,721.

MEPS is the most complete source of data on the cost and use of health care and health insurance coverage, based on large-scale US-wide surveys of families and individuals, their medical providers, and employers. Run by the Agency for Healthcare Research and Quality, MEPS's complex sampling includes stratification, clustering, multiple stages of selection, and disproportionate sampling. The sample is a sub-sample of respondents from the previous year's National Health Interview Survey, sponsored by National Center for Health Statistics. That earlier survey has a stratified multistage sample design. In the first stage primary sampling units are selected and consist of counties or groups of counties. In the second stage, area segments are selected within the primary sampling units and, finally, housing units are selected within the area segments. The panel design of MEPS is conducted over two calendar years, includes five rounds of interviewing and is administered using Computer Assisted Personal Interviewing technology. Households containing Hispanics, Blacks, Asians, and those predicted to be below twice the Federal Poverty Level (FPL) were oversampled for both the panels in 2006. A detailed description of MEPS methodology is published (Center for Financing Access and Cost Trends, 2008) and the survey's design complexities were taken into account during analysis in this study.

The outcome variable for OHCS utilisation was defined as having visited a dentist in the past year, dichotomised as 'Yes' and 'No' for this analysis and was created from the MEPS data on number of visits to any type of dental care provider. Individuals below the Federal Poverty Level (FPL) were classified as 'Poor' and those between 1 and 1.99 times the FPL were classified as being 'Low' income. Other income categories included Middle (2 to 3.99 times FPL) and High (over 3.99 times FPL). The 2006 FPL for a household of one person was US $9,800 with an US$3,400 added for each additional person. Public dental insurance coverage was inferred from a self or proxy report of Medicaid/SCHIP, Medicare, TRICARE and other public hospital/physician coverage. Coverage by a private plan with dental insurance was coded as having 'Private dental insurance'.

Differences in proportions were tested for significance using the chi-square test. Unadjusted odds ratios for having visited a dentist were calculated. Based on the bivariate and correlation analysis variables were selected for the regression analyses. Unconditional, bivariate logistic regression analysis to model the log-odds of a dental visit was conducted to identify factors independently associated with OHCS utilisation. The goal of these multivariable analyses was to identify a parsimonious explanatory model for OHCS utilisation and assess impact of confounding on the observed crude odds of OHCS utilisation. The regression analysis commenced with a "full model" including all the available variables with the intention to backward-eliminate unimportant variables manually, followed by regression diagnostics. Criteria identified for backward elimination included a 10% change in risk estimate and assessment of differences between hierarchical set of models using likelihood ratio test. We carried out these analyses in SAS 9.2 using survey procedures to obtain appropriate standard errors adjusted for the complex sampling method in MEPS (Center for Financing Access and Cost Trends, 2008).

Results

The appropriate analysis of the MEPS complex sample allows for generalisation of the results to the US adult non-institutionalised population. MEPS (2006) represented approximately 222 million non-institutionalised US adults. Of these, 42% reported a dental visit in the past year. Table 1 describes the sample characteristics and OHCS utilisation attributes. The overall sample had a slightly

greater proportion of females (52%), consisted primarily of Non-Hispanic Whites (69%), 50% with more than a high school education; and approximately 28% had annual household income below 200% of the Federal Poverty Level (FPL). More dental visits were reported among respondents in the 55-64 years age group (50%), women (46%), Non-Hispanic Whites (49%), the higher income category (57%), the employed (43%) and those individuals with private dental insurance (53%).

The regression based adjusted odds ratios (95% confidence intervals, CIs) for a dental visit in 2006 and their associated statistics are described in Table 2. The data shows a trend for more dental visits as one gets older, up to 64 years of age, following which it declines. In general, older individuals ages 55-64 years, were approximately twice as likely to report a dental visit compared to the youngest (18-24 years) (crude OR=2.06, p<0.0001). After adjusting for multiple factors, the magnitude of

Table 1. Adult utilisation of dental services in 2006 by potential explanatory factors

Variables and Levels	*MEPS 2006 Sample Size*		*Those with a Dental Visit in 2006*		
	Unweighted n	*Weighted %*	*Unweighted n*	*Weighted %*	*p-value**
All	22721	100	8204	42	
Age Group					**<0.0001**
18-24	2948	13	837	33	
25-34	3913	18	1113	36	
35-44	4373	19	1572	42	
45-54	4437	19	1794	46	
55-64	3244	15	1432	50	
65+	3806	16	1456	45	
Gender					**<0.0001**
Female	12320	52	4771	46	
Male	10401	48	3433	38	
Race/Ethnicity					**<0.0001**
Non-Hispanic White	12214	69	5725	49	
Non-Hispanic Black	3725	11	943	28	
Other (non-Hispanic)	1421	7	488	36	
Hispanic	5361	13	1048	23	
Education Level					**<0.0001**
More than high school	9415	50	4716	53	
High school	6963	31	2236	37	
Less than high school	6147	19	1219	24	
Income-%FPL**					**<0.0001**
High income (400+)	7341	42	4061	57	
Middle income (200-399)	6544	31	2271	39	
Low income (100-199)	5038	17	1125	26	
Poor income (< 100)	3798	11	747	23	
Metropolitan Area					**<0.0009**
MSA	18715	83	6912	43	
Non-MSA	4006	17	1292	38	
Census Region					**<0.0001**
South	8564	36	2593	37	
West	6174	23	2122	42	
Midwest	4566	22	2004	47	
Northeast	3417	19	1485	47	
Self-reported Health					**<0.0001**
Excellent	4965	25	2034	47	
Good	14096	63	5166	43	
Fair	3589	13	993	33	
Employment Status					0.0547
Employed	15520	73	5834	43	
Unemployed	7069	27	2346	41	
Dental Insurance					**<0.0001**
Private dental†	8698	45	4338	53	
Public dental‡	5912	22	1840	38	
No dental	8111	34	2026	31	

* General association p-values for dental visit difference within the socio-demographic-economic groups
**Family income as a percentage of the Federal Poverty Level.
† Includes respondents reporting dental coverage by a private health insurance plan with some dental coverage.
‡ Includes those reporting coverage under TRICARE, Medicare, Medicaid or SCHIP, or other public hospital/physician programs.
MSA=Metropolitan Statistical Area

Table 2. Unadjusted and adjusted Odds Ratios (OR) for having visited a dentist in 2006 by explanatory factors

Factors and levels	*Unadjusted*		*Adjusted**		*% Change in crude OR and direction***
	OR (95% CI)	*CLR*	*OR (95% CI)*	*CLR*	
Age Group					
18-24	**1**		**1**		
25-34	1.16 (1.01, 1.32)	1.31	0.92 (0.79, 1.06)	1.35	- 21.03
35-44	1.48 (1.30, 1.68)	1.29	1.09 (0.95, 1.26)	1.34	- 26.05
45-54	1.78 (1.57, 2.01)	1.28	1.23 (1.07, 1.41)	1.32	- 30.74
55-64	2.06 (1.79, 2.37)	1.32	1.44 (1.24, 1.68)	1.35	- 30.10
65+	1.73 (1.50, 1.99)	1.32	1.35 (1.13, 1.61)	1.42	- 22.05
Gender					
Women	**1**		**1**		
Men	0.71 (0.67, 0.75)	1.12	0.67 (0.63, 0.72)	1.14	- 5.78
Race/Ethnicity					
Non-Hispanic White	**1**		**1**		
Non-Hispanic Black	0.40 (0.36, 0.45)	1.25	0.53 (0.47, 0.60)	1.26	+ 32.67
Other (non-Hispanic)	0.59 (0.50, 0.69)	1.36	0.56 (0.48, 0.66)	1.38	- 4.25
Hispanic	0.31 (0.27, 0.34)	1.24	0.52 (0.47, 0.58)	1.24	+ 67.78
Education Level					
More than high school	**1**		**1**		
High school	0.51 (0.46, 0.55)	1.19	0.62 (0.57, 0.67)	1.19	+ 21.94
Less than high school	0.27 (0.25, 0.30)	1.21	0.47 (0.42, 0.53)	1.25	+ 73.53
Income-multiple of FPL†					
High income (4+)	**1**		**1**		
Middle income (2-3.99)	0.48 (0.43, 0.53)	1.22	0.64 (0.58, 0.71)	1.23	+ 33.82
Low income (1-1.99)	0.27 (0.23, 0.30)	1.30	0.44 (0.38, 0.50)	1.32	+ 63.53
Poor income (<1)	0.23 (0.20, 0.26)	1.31	0.42 (0.37, 0.49)	1.33	+ 83.84
Metropolitan Area					
MSA	**1**		**1**		
Non-MSA	0.81 (0.72, 0.91)	1.27	0.86 (0.78, 0.95)	1.23	+ 6.05
Census Region					
South	**1**		**1**		
West	1.22 (1.07, 1.40)	1.31	1.20 (1.07, 1.36)	1.27	- 1.56
Midwest	1.52 (1.34, 1.71)	1.27	1.31 (1.17, 1.47)	1.26	- 13.65
Northeast	1.47 (1.29, 1.68)	1.30	1.31 (1.16, 1.48)	1.28	- 11.09
Self-reported Health					
Excellent	**1**		**1**		
Good	0.86 (0.79, 0.93)	1.18	0.89 (0.81, 0.98)	1.20	+ 4.21
Fair	0.57 (0.51, 0.63)	1.22	0.74 (0.66, 0.84)	1.28	+ 30.40
Employment Status					
Employed	**1**		**1**		
Unemployed	0.93 (0.86, 1.01)	1.18	1.22 (1.10, 1.35)	1.23	+ 30.69
Dental Insurance					
Private dental‡	**1**		**1**		
Public dental#	0.54 (0.50, 0.60)	1.20	0.69 (0.61, 0.79)	1.30	+ 27.57
No dental	0.39 (0.36, 0.43)	1.19	0.52 (0.47, 0.58)	1.22	+ 34.88

* Adjusted for all other factors in the table.

** If OR>1 then the "-" sign indicates movement of OR towards the null value; whereas if OR <1, then "+" sign indicates movement of OR towards null value.

† Family income as a percentage of the Federal Poverty Level.

‡ Includes those respondents who reported dental coverage by a private health insurance plan that included at least some dental coverage.

Includes those individuals reporting coverage under TRICARE, Medicare, Medicaid or SCHIP, or other public hospital/physician programs.

OR=Odds Ratio; CI=Confidence Interval; CLR=Confidence Limit Ratio; MSA=Metropolitan Statistical Area

this association decreased to 1.44 (CI: 1.24-1.68) (a 30% decline on adjustment) indicating that the crude odds ratio was confounded 43% upwards. Men were 71% as likely to report a dental visit as women (crude OR=0.71, p<0.0001). The magnitude of this association increased to 0.67 (p<0.0001) when adjusted for other factors in the model. Hispanics were approximately 70% less likely to report a dental visit in 2006 compared to Non-Hispanic Whites (crude OR=0.31, p<0.0001). The magnitude of this association decreased but remained significant (Adj. OR=0.52, p<0.0001) indicating that the unadjusted statistic was confounded downward by approximately 68%. Those who were poor and had low income were 27% and 23% as likely to visit a dentist as the high income group. The adjusted analysis indicated that these numbers were confounded downward by 64% and 84%, respectively (Adj. ORs of 0.42 and 0.44, respectively, p<0.0001). The odds of visiting a dentist were similar for those who were unemployed (OR=0.93. p>0.05) compared to those who were employed. However, in the logistic model the unemployed respondents were found to be 22% more likely to visit the dentist compared to employed respondents (Adj. OR=1.22, p=0.0002). Those with no dental insurance were approximately 60% less likely to visit a dentist (OR=0.39, p<0.0001) and after adjusting for other factors the magnitude of this association decreased (Adj. OR=0.52, p<0.0001, downward confounding of 35%).

Discussion

In this analysis, factors found to be significantly associated with greater odds of reporting a dental visit in the past year included: older age (45 years and over), being female, being Non-Hispanic White, having more than a high school education, having a high income level, and residing in a metropolitan statistical area, having a self-perceived general health status of 'excellent', being unemployed and having private dental coverage. Most adjusted ORs in the multivariable model moved towards the null value substantially compared to their observed/crude values. This indicates that the observed odds of dental visit were confounded by several factors such as race/ethnicity, education and income which are important factors for which health-related disparities are studied.

Overall OHCS utilisation estimates derived in this study (42%) are consistent with those reported for previous years, using data from the same survey but for other time periods. For example, weighted OHCS utilisation rates, using MEPS, for 1977, 1987, 1996 and 2004 were approximately 41%, 42%, 43% and 44%, respectively (Brown and Manski, 2003; Manski and Cooper, 2007; Manski and Moeller, 2002; Manski *et al.,* 1999, 2001b). Data from the National Health Interview Survey show higher utilisation rates ranging from approximately 54% in 1983 to 61% in 1993 (US Department of Health and Human Services, 2000). Possible reasons for the difference in utilisation estimates across these nationally representative surveys include: differences across surveys in terms of reference periods, lead-in statements, question wording, the way to which dental professionals were referred, and social desirability (Macek *et al.,* 2002). However, important differences by socio-economic and demographic factors remain consistent across these surveys. The proportion of population incurring dental care charges in 1987 (44.5%) and 1996 (43.7%) are slightly higher than the visit proportions reported from studies assessing dental visits (42% and 43% respectively) (Chattopadhyay *et al.,* 2003; Manski *et al.,* 1999, 2001b; Vargas and Manski, 1999). We attribute these differences (from the same databases) to analytical paradigms for data optimisation used in different studies. It may also be possible that some dental charges may have been incurred in a financial year even though the reported dental visit may have actually occurred in a different year.

The results of this study indicate significantly lesser OHCS utilisation among persons belonging to minority race/ethnic groups. Numerous studies have documented similar differences (Davidson and Andersen, 1997; Manski and Brown, 2007; Manski and Magder, 1998). In this study, only 23% of Hispanics reported a dental visit in 2006, which is lower than the 28% reported by Manski and Brown (2007), for 2004 using MEPS data. Data reported in *Oral Health in America: A Report of the Surgeon General* also reported similar findings of racial/ethnic minorities having the lower OHCS utilisation rates, this, despite the fact that these racial/ethnic minority groups have the greater need for oral care compared to Non-Hispanic Whites (Borrell and Crawford, 2008; Dye *et al.,* 2007; Vargas *et al.,* 1998). The study by Shi *et al.* (2010) on access to dental care by racial/ethnic groups, reported conflicting results to our study. While, racial/ethnic disparities in access to care persist, and cannot be entirely explained by socioeconomic differences, the nature of these disparities depends on the socioeconomic position of racial/ethnic groups as well as the access measure used. The manner in which variables were used and coded could also account for the differences observed. For example, we coded the dental public insurance variable to include those persons reporting coverage under TRICARE, Medicare, Medicaid or SCHIP, or other public hospital/physician programs, whereas Shi *et al.,* used Medicaid as the only proxy for public health insurance. Also, 16% of our study were 65 years and older, whereas Shi *et al.* restricted age to 18-64 years. Reasons for these disparities in utilisation are not easily explained due to the fact that these observed differences may reflect variations in other related factors that are difficult to measure accurately, such as wealth/poverty, education, cultural values, and structural or other barriers to care such as access issues and community characteristics. For example, after adjusting for factors such as education and income, the OR for Hispanics reduced from 0.31 (crude) to 0.52 (adjusted) (Table 2). This movement of the OR towards unity shows that a substantial proportion of the observed "race/ethnic" OR for OHCS utilisation is explained by several other factors measured and used in statistical adjustment in this study (factors adjusted for in the model presented in Table 2). It is likely that several other meaningful factors, such as wealth/poverty, neighbourhood characteristics, peer-network groups, social support networks, and existing policy that were not measured in this study may also impact these associations.

Employment and dental insurance have been associated with increased OHCS utilisation (Wall and Brown, 2008), which in turn is shown to be associated with better oral health. While we found that those without insurance or with public insurance were less likely to visit a dentist even after adjustment for other factors in the model, the association of employment with OHCS utilisation was different. Whereas there was no difference between dental visits in the past year between those who were employed and those who were not, after adjusting for other factors in the model, the adjusted estimate suggested greater odds of visits to a dentist by those unemployed compared to those who were employed. Though this is an intriguing outcome, we attribute it to analyses related to two potential issues: first, in MEPS, those who were employed for any time of the year were classified as "employed" irrespective of the duration of their employment or full-/part-time. Therefore, it is possible that differential misclassification of the employment factor within other factors could have impacted the analyses. The inability to differentiate between part-time/part-year employment from full-year employment could have been an important factor, which seems to be substantiated by a report from the US Bureau of Labor Statistics showing that in 2005 there was a substantial spike in mass layoff events (totalling to about 2200 seasonally adjusted events). A mass layoff occurs when at least 50 initial claims for unemployment insurance are filed against an establishment during a consecutive 5-week period. This led to a massive increase in initial unemployment claims (increase from about 115,000 to 300,000 seasonally adjusted claims). This number of initial claims was only 26,392 fewer than that during the peak of the greatest recession in 2009. In 2006, although overall employment increased over 2005, the number of job openings declined. Therefore, it is likely that the self-reported "unemployed" group in 2006 may have included several who had some kind of dental insurance coverage continuing since 2005. Secondly, it is also possible that many reporting as "employed" were in part-time/part-year employment pool in 2006. Thirdly, it also is possible that the analyses may have been influenced by potentially small cell sizes in some categories during multivariable analyses. Our confidence in these potential explanations is strengthened by the observation that there was only a 2 percentage point observed difference in dental visits between the employed (43%) and unemployed (41%, Table 1). In general, we noted that odds of dental visits increased with age with a reversal from 65 years. Similar outcomes were observed for groups such as reducing odds of dental visit with lesser education and reducing odds of dental visits with reducing income-related status by FPL. These trends remained the same after multivariable adjustments in the models even though we noted that confounding was high for most observed crude associations. One clear outcome was that upon adjustment, almost all factors moved towards the null on confounding, indicating a need for studies assessing the role of confounding, especially residual confounding resulting from confounding by unmeasured variables and confounding by measurement error in variables. Although this study did not aim to develop a "causal model" for OHCS utilisation, an "explanatory model" as in this study, shares with non-randomised studies on the causal effects, influences by residual confounding, and may be biased by characteristics that are not fully adjusted or sometimes not completely specified in the models.

To achieve the goal of reducing disparities in OHCS utilisation by different socio-economic groups, those factors that can be modified (public health modifiable factors) to improve OCHS utilisation by the population should be identified. Evidence suggests that regular users of OHCS have better oral health as a result of the timely intervention (Thomson *et al.,* 2010; Vargas and Ronzio, 2002). Hence, efforts could usefully be made to enhance OHCS utilisation, particularly among those at a higher risk for developing oral diseases and also at greater risk for not utilising OHCS. It is understood that OHCS utilisation is a complex issue affected by interplay of social, behavioural, political, economic, cultural and biologic systems. To better understand this area, future analysis will require a systems approach, which integrates individual systems or functioning units into the larger complex hierarchical system with all interacting forces that influence action to produce real world outcomes (Chattopadhyay, 2010).

Conclusions

Under half of the US adult population reported a dental visit in 2006. This proportion appears to be more or less unchanged over the past four decades. Determinants of OHCS utilisation included: being older, female, Non-Hispanic White; having higher income, excellent perceived health, and private dental insurance. Creative initiatives and systemic approaches to increase utilisation of OHCS by groups that utilise OHCS less often, will help to address utilisation disparities, which could be an important step towards oral health equity.

Acknowledgement

This study was supported by the National Institute of Dental and Craniofacial Research, Bethesda, MD, US. We thank Dr Richard Manski and Ms Tina Stiller for their input to this study.

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