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Diversity in The Use of Specialized Dental Services by Older Adults in the United States

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Abstract

Objective: We estimated the use of any dental services and the use of specific types of dental services conditional on any dental use for adults 50 and over in the United States to analyze (1) disparities in use of specialized dental services and (2) whether older adults receiving routine dental care use fewer expensive specialized dental services.

Methods: We relied on data tabulations and estimated logistic regressions from the 2014 Medical Expenditure Panel Study to analyze the influence of various covariates such as age, race/ethnicity, education, dental insurance, income, and health status on the likelihood of (i) using any dental care and (ii) using routine dental care (prophylaxis, examinations, bitewings, etc.) and specialized services for restorative, periodontal, oral surgery, or prosthetic dental care conditional on using any dental care.

Results: We found (1) higher use of specialized services among higher income, more educated, healthier, non-minority older adults and (2) association between lower use of routine dental care and higher use of expensive restorative, oral surgery and prosthetic dental services.

Conclusion: Our study identifies diversity in the use of specialized dental services among an older adult population, and suggests that more widespread use of routine dental services could potentially improve oral health and limit the need for expensive specialized dental care for this population.

Keywords

Dental; Utilization; Dentistry; Insurance; Coverage; Retirement

INTRODUCTION

The need for dental services among older adults in the United States has been well documented. We focus our study on adults 50 and older because the need for specialized dental services apart from orthodontics increases as individuals advance in age. Beyond routine dental care, it is estimated that over 60% of seniors have moderate or severe gum disease that has been shown to be associated with other life-threatening diseases or conditions such as diabetes and heart disease.¹ The 2009/10 National Health and Nutrition Examination Survey (NHANES) identified 64% of persons 65 and older with one or more teeth having moderate or severe periodontitis.² Older African-Americans are twice as likely as whites to have periodontitis, while low-income older adults have twice the rate of gum

disease as more affluent older adults.³ In addition, oral and pharyngeal cancers are 7 times more likely to be diagnosed among those 65 and over compared to those under 65.⁴ Without routine check-ups, lower early detection rates of oral and pharyngeal cancer among seniors will often result in a more advanced stage at diagnosis, a poorer prognosis and will often require more costly and extensive treatment. Another study examined correlations between 3 oral health problems (significant loss of permanent teeth, presence of root caries, and presence of periodontitis) and mortality using a pooled sample of 5,588 persons 40 years and older from the 1999–2004 NHANES linked to the National Death Index through 2006.⁵ Mortality curves based on the logistic regressions showed the highest curve for those with tooth loss compared to those with root caries and those with periodontitis, and the highest over-all curve for those with all 3 oral health problems.

Currently, Medicare makes little or no provision for dental care reimbursement. With the exception of dental care more extensive than the teeth or supporting structures or dental care made more complicated by a concomitant medical problem, Medicare insurance generally does not pay for dental care.⁶ In addition, dental care coverage under Medicaid for low income older Americans is often limited to emergency services in many states and nonexistent in others.⁷ Despite very limited dental service coverage under Medicare, the effect of poor oral health on medical care services that are covered is becoming better understood. Poor oral health may be correlated with more Medicare eligible citizens having medical conditions requiring additional and more extensive medical care use and higher Medicare expenditures. These higher Medicare costs would be in addition to the already spiraling costs now associated with Medicare.

In this context it is especially critical to identify potential disparities in the characteristics of older adults currently using dental services and dental services of a particular type in the United States to target policies towards the most underserved groups. Several previous studies have provided this type of analysis but have done so on older data and on a more limited sample size of elderly adults.^{8–10} Although types of dental services were grouped in these studies, in none of these cases were types of dental services defined in as much detail as used in our study. The purpose of this paper is to build upon these studies and provide a more detailed assessment of disparities in the characteristics of older adults currently using specialized dental services and the potential consequences of foregoing routine dental care.

METHODS

Data:

For our study we used a subset of 9,617 non-institutionalized, community-based adults aged 50 years and older from the 2014 Medical Expenditure Panel Study (MEPS). The MEPS is a nationally representative household survey sponsored by the Agency for Healthcare Research and Quality in the Department of Health and Human Services. The MEPS collects detailed information about medical and dental visits, insurance and expenditures, and payments as well as socio-demographic characteristics of the U.S. community-based population. MEPS respondents are sampled 5 times over a 2-year sample period.¹¹ Our project was reviewed by the UMB Institutional Review Board (IRB) and determined to be a

scientific research project which does not involve participation or information from human subjects and therefore is not a human subject research project.

We used the 2014 MEPS consolidated full-year household and dental event public use files to extract the data for our analysis. In addition the MEPS dental event file provided detailed information on each dental visit during the year including the type of dental provider and type of services used in addition to the amounts paid by various sources. From this file we constructed binary-coded dependent variables for our study defined as the likelihood of each of the following 6 types of dental use measured by receipt of any of the services repeated verbatim below from the survey check-off list for a given type at any dental visit during the year:

- *Routine Diagnostic or Preventive Visit:* (i) cleaning, prophylaxis, or polishing, (ii) general examination, checkup or consultation, (iii) x-rays, radiographs, or bitewings, (iv) fluoride treatment, or (v) sealant
- *Restorative or Endodontic Visit:* fillings, inlays, crowns or caps, or root canal
- *Periodontal Visit:* (i) periodontal scaling, root planing, or gum surgery, or (ii) periodontal recall visit (periodic or regular)
- *Oral Surgery:* (i) extraction, tooth pulled, (ii) implant, (iii) abscess or infection treatment, or (iv) other oral surgery
- *Prosthetics:* (i) fixed bridges, (ii) dentures or removable partial dentures, or (iii) relining or repair of bridges or dentures
- *Other:* (i) orthodontia, braces, or retainers, (ii) bond, whiten or bleach, (iii) treatment for TMD (temporomandibular disorders) or TMJ (temporomandibular joint disorders) or (iv) other dental procedures

We also constructed a dependent variable for the likelihood of a dental visit during the year defined by receipt of any of the 6 types of services at least one time during the year.

Andersen's behavioral model of health services use was the theoretical basis for independent variables constructed from the MEPS consolidated full-year household file.¹²⁻¹⁷ Specifically we considered enabling variables (dental insurance and family income), need variables (dentate status, physical and mental health status, and presence of any physical functioning limitations), and predisposing variables (age and Medicare status, sex, race/ethnicity, educational attainment, marital status, retirement and labor force status, census region, family size, and frequency of dental checkups). Persons with dental insurance are identified by a positive response to a direct question regarding this coverage or by reporting any third party payment source for any dental event during the year such as private insurance, Medicaid, VA or CHAMPVA, TRICARE, or other private or federal, state, or local public payment.¹⁶⁻¹⁷

Estimation:

To identify factors correlated with the use of different types of dental services we estimated both bivariate mean differences in covariates and logistic regression that enabled estimating

these differences after controlling for other potentially confounding variables. We estimated separate regression models for dentate and edentulous populations because of differences between the two groups in the nature of non-routine services utilized. The MEPS core sample designs are multistage area probability ones, so all estimates and statistics reported were computed taking into account this complex design with the use of the software packages SUDAAN and STATA.^{18,19} Generally only estimates significant at least at the 5% level are discussed.

RESULTS

Overview:

Of the 109 million community-based adults 50 years and older in 2014, close to half (46% or 49.94 million) were on Medicare (Table 1). Not surprisingly a higher rate of those on Medicare were edentulous (21% or 10.3 million) compared to those without Medicare coverage (6% or 3.7 million). We also found that the dentate Medicare population is about 6 percentage points more likely to have a dental visit during the year than their dentate counterparts not covered by Medicare. Edentulous non-Medicare individuals however are about 9 percentage points more likely to have a dental visit than edentulous Medicare beneficiaries. Still only slightly over half of the dentate Medicare population (55%) visited the dentist at least once during year, while only 12% of the edentulous Medicare population saw a dentist during the year. Apart from routine diagnostic or preventive care, the primary reason for dentate patients to see the dentist was for fillings, inlays, crowns, or root canals. For edentulous patients it was for prosthetic services. In all cases except the category other services, dentate Medicare patients were more likely to need non-routine services than dentate non-Medicare patients.

Unadjusted Characteristics of Dental Users:

Bivariate mean comparisons for dentate older adults within each independent variable category are provided across the dependent variables for any dental use and for use of each of the 6 specific services conditional on any dental use (Table 2). The smaller sample size of edentulous older adults prohibited similar bivariate mean comparisons with our data.

Any dental use: The likelihood of having any dental visit among an older adult dentate population varies markedly across various population subgroups. Medicare beneficiaries under 65 years of age who qualify for coverage based on health reasons are substantially less likely to visit the dentist during the year (33%) than the over 65 beneficiaries qualifying on age alone (57%). A profile of dentate persons more likely to visit the dentist during the year compared to their counterparts is characterized as: female; white, non-Hispanic; with at least a college degree; married; covered by dental insurance; retired; high income; typically visits a dentist twice a year for checkups; in excellent or very good mental health; not living in the South; and without any physical limitations.

Routine Care: For those dentate persons with at least one dental visit, a similar profile distinguishes those more likely to have a routine diagnostic or preventive visit from those except for the absence of gender, labor force/retirement, and region effects. Overall, 93% of

dentate dental patients have at least one routine dental visit during 2014, but this percentage drops to only 87% for those in poor families, and to 75% for those typically going to the dentist less than once a year for check-ups.

Endodontic, Restorative Care: Among older dentate adult dental patients, 35% used endodontic or restorative services in 2014. Members of this group more likely to use these services compared to their counterparts are identified by a limited set of characteristics: white or other non-Hispanics; in fair or poor health; and with physical limitations. Interestingly those reporting dental checkups twice a year or more were no more likely than those reporting fewer checkups during the year to need endodontic or restorative services.

Periodontal Care: Overall, only 5 percent of dentate older adult dental patients used periodontal services in 2014. Members of this group less likely to use these services than their counterparts were: either not on Medicare (compared to those on Medicare) or on Medicare and less than 65 (compared to beneficiaries 65 and older); not covered by dental insurance; not retired and not in the labor force; poor; and not typically having dental checkups twice a year or more.

Oral Surgery: About 13% of dentate older adults had some type of oral surgery during 2014. Oral surgery was more likely for Medicare patients compared to non-Medicare patients (15% v. 11%), for the Medicare population under 65 (25%) compared to Medicare patients 65 to 74 (12%), and for Medicare patients 75 and over (18%) compared to Medicare patients 65 to 74. Other characteristics distinguishing older dentate adults requiring oral surgery during 2014 from their counterparts included: not white, non-Hispanic; less than a high school degree; widowed, divorced or separated rather than married; in fair or poor physical and mental health; not in the labor force; not high income; not typically seeing a dentist for checkups twice a year or more; and with physical limitations. About one-fourth of dental patients with less than a high school degree, and one-fifth of those with fair or poor physical or mental health status or in low income or poor families needed oral surgery in 2014. One-third of those dental patients (or more) claiming to have checkups less than once a year (or never) visited the dentist for oral surgery during 2014.

Prosthetic Care: Only 6% of older dentate adults sought prosthetic dental services in 2014. Medicare patients were twice as likely as non-Medicare patients to need these services (8% v. 4%). Black, non-Hispanics were more likely than white, non-Hispanics to use these services (9% v. 6%). Those not requiring these services were characterized as having a college degree or beyond, married, in excellent or very good physical or mental health, in the labor force, high income, typically see the dentist once a year or more for checkups; live with others, and not having any physical limitations. Chances of requiring prosthetic services for bridges or dentures were 16% (or more) for those seeing the dentist for checkups less than once a year (or never).

Other Care: Other services were acquired by 6% of dental patients but were so varied in nature that few if any systematic patterns characterized the types of dental patients using these services.

Adjusted Characteristics of Dentate Dental Users:

Estimated odds ratios from logistic multiple-variable regressions for dentate (Table 3) and edentulous (Table 4) older adults show the influence of individual characteristics after controlling (or adjusting) for other potentially confounding variables in the equations. Results for the dentate population are not strictly comparable to the bivariate comparisons above (Table 2) because the regressions only estimate correlations between a reference group, such as non-Medicare older adults and each of the other sub-groups within a covariate category (Medicare beneficiaries ages 50–64, 65–74, and 75 and older) unlike the unadjusted estimates that compare every subgroup within a covariate category to each other. Co-linearity between covariates also reduces the number of statistically significant correlations found in the regressions compared to the bivariate estimates. We group the adjusted results below by the 3 general categories of theorized independent variables in our behavioral model and discuss the results for each factor across each of the regression equations.

Enabling Factors: Having dental insurance increases the odds of seeing the dentist during the year and, for dentate older adults, having a routine dental visit. Otherwise, dental coverage does not improve the chances of having any type of non-preventive dental service for either dentate or edentulous patients. We found family income to have no effect on having a dental visit, but being non-poor did increase the odds over poor dentate persons of obtaining restorative or endodontic dental care. For edentulous patients there were signs that higher income increases the odds of having routine care, but decreases the odds of seeing a dentist for prosthetics.

Need Factors: For dentate patients we found no association between dental services of any kind and mental health status and physical functioning limitations. We did find physically healthy dentate individuals to be less likely to need oral surgery or restorative dental care, and less physically healthy edentulous persons more likely to need prosthetic and oral surgery services.

Predisposition Factors: Our findings show that older dentate Medicare adults compared to younger dentate Medicare adults are more likely to see the dentist and use routine, periodontal, and prosthetic services. There is also evidence that dentate minority persons compared to white, non-Hispanics are less likely to see a dentist during the year and use restorative services if they do see a dentist, but are more likely to need periodontal and prosthetic services once they see a dentist. The less educated dentate older adults are also less likely to see a dentist at least once during the year for any reason but are more likely to need restorative and oral surgery services after going to the dentist. Those dentate older adults who perceive themselves going to the dentist non-regularly are less likely to obtain routine care and more likely to require oral surgery and prosthetic services once they go to the dentist. Edentulous minority older adults are less likely to see a dentist than white, non-Hispanics, and less educated edentulous older adults are more likely to use oral surgery and prosthetic services than higher educated ones when they do go to the dentist. The results for the edentulous population were generally less pervasive and consistent most likely because of the limited sample size for this group of older adults.

Lack of Preventive Care and Non-Preventive Services:

We also addressed the issue of whether dental patients not receiving routine diagnostic and preventive services are more likely to need expensive specialized dental services. We ran the same regressions for specialized services as in Tables 3 and 4 for the respective dentate and edentulous dental patients but added an additional binary-coded variable for not receiving routine dental care during the year. We only show the odds ratios for the variable indicating no routine care during the year in the regressions for the likelihood of needing each respective non-routine dental service (Table 5). The results show that failing to have at least one routine diagnostic or preventive dental visit during the year makes it more likely for a dentate patient to need restorative or endodontic services, oral surgery, and prosthetic services, and for an edentulous patient to need prosthetic dental services. Dentate patients with and without a routine dental visit were equally likely to need periodontal services, while having or not having a routine visit had no correlation with the odds of an edentulous patient having need of oral surgery.

DISCUSSION

Policy Implications:

Our results suggest that policies encouraging older adults to regularly seek routine dental care (or any dental care at all regardless of type), can lessen the need for expensive major dental services. Interestingly, however we also find that the characteristics of those most likely to obtain routine dental care in some instances also match the characteristics of those most likely to receive non-routine services. This is not surprising because routine dental visits often identify oral health problems requiring restorative or other specialized services. For example, our results show that older dentate Medicare adults are more likely than younger ones to have routine visits but also are more likely than younger ones to have periodontal and prosthetic visits. Older dentate minority adults are less likely than white, non-Hispanics to see a dentist during the year, but are more likely to have periodontal or prosthetic services when they do have a dental visit. Less educated dentate older adults are also less likely to go to the dentist but are more likely to need restorative or surgical services when they do. And finally those older dentate adults who typically fail to get regular check-ups are more likely than those who do to need surgical and prosthetic procedures. Establishing a routine of regular routine dental visits from our results is best encouraged by providing dental health insurance coverage to older adults, while educating them regarding the oral and potential medical consequences of failing to maintain oral hygiene and checkups could also encourage this behavior.

Related Studies:

Our dental use estimates for dentate older adult patients are generally higher than those from a 2004 MEPS chart book because the 2004 estimates merged the dentate and edentate population. For example, the percentage of dentate dental patients in 2014 receiving routine preventive and diagnostic (93%) and non-routine restorative (35%) services are understandably higher than similar estimates from the 2004 MEPS (82% for preventive, 75% for diagnostic and 24% for restorative services).¹⁹

A 2006 Health and Retirement Study (HRS) logistic regression of any dental use over a two-year period produced age, race/ethnicity, education, family size, retirement, and dental insurance effects similar to our results, but also found any dental use more likely for older adults who are female, in high-income families, married, and in excellent health that our results did not show.²¹

A more recent study grouped dental care into no visits, any non-routine major visits for restorative, surgical, or prosthetic services, and only 1 or more non-major visits over a 2-year period from a sub-sample of about 1,000 older adults in the 2008 HRS.⁸ The authors only found oral health status, dental insurance, and financial status associated with no dental visits over a 2-year period, and only oral health status correlated with any major dental visit during this period. We found similar correlations between dental insurance and both any dental visit and routine care, and between health status and restorative and oral surgery care, but we also found correlations between lower family income and greater need for restorative and endodontic services as well as correlations between age of Medicare beneficiaries, minority status, education, and self-reported typical use of dental checkups with the use of various major services.

Another study relied on nearly 10,000 Medicare beneficiaries from the 2002 Medicare Current Beneficiary Survey (MCBS) to estimate multinomial logistic regressions to compare characteristics of persons without a dental visit against preventive dental care patients, defined as beneficiaries having at least one cleaning during the year, and against those using only non-preventive dental care during the year.¹⁰ The MCBS study found users of preventive care compared to users of only non-preventive care more likely to be white, non-Hispanic, female, high income, highly educated, and married. We found the same marital status attribute but also found routine preventive users to be relatively older, insured, and typically having dental checkups at least twice a year. The MCBS study lacked a dental insurance coverage variable but did have a proxy for oral health status that was not available in our MEPS study. Regression analysis of non-preventive visits and expenditures in the MCBS study showed that beneficiaries with a preventive dental visit had lower non-preventive dental use and expenses than those without preventive care. Those results are comparable to our findings that older dentate adults without a routine preventive or diagnostic visit are more likely to need restorative, endodontic, oral surgery or prosthetic dental services, and that older edentate adults without a preventive visit are more likely to need prosthetic services.

Limitations:

Our data were unable to distinguish dental coverage for routine services alone from more generous coverage including non-routine services. This likely limited our ability to find correlation between dental insurance and non-routine services. Our coverage estimates also do not account for selection bias from the potentially endogenous dental insurance variable in all equations and the routine dental use variable in the non-routine dental service equations. Failure to find any effect of coverage in the non-routine regressions could suggest that insurance providers self select prospective clients, while positive findings in the any use and routine care equations could suggest that needy dental patients select into coverage as

found in a previous study using MEPS data.⁹ Our data were also limited by not having direct measures of oral health status either from self-reports or from dental examinations as in the NHANES and from omitting out of pocket price and provider supply variables.^{2,9} Out of pocket price variables in a recent study were found to have no effect on any group of dental services for a younger population, so that result lessens the likelihood of bias from their omission in our study.⁹ Dental use data, unlike medical data for physicians, hospitals, and other facilities in the MEPS, is not supplemented or verified by survey follow-back to dental providers.¹¹

Conclusion:

Our study confirms the relatively low use of non-routine dental services, particularly for periodontal services and particularly among lower income, less educated, less healthy, minority older adults, in view of the established need for such services among this population and the potential adverse effects on physical health from foregoing proper treatment for oral disease.²² Our study also confirms earlier results showing that obtaining routine preventive dental care can help lessen the need for expensive major dental services.

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Table 1.

Population 50 Years and Older by Dentate and Medicare Status and Percentage with Dental Care by Type of Dental Services: United States, Medical Expenditure Panel Survey, 2014

	Dentate		Edentulous	
	No Medicare	Medicare	No Medicare	Medicare
	Population			
<i>Age</i>				
50–64	54,493,000	4,028,000	3,524,000	942,000
65+	639,000 [#]	35,610,000	148,000 [#]	9,362,000
Total	55,132,000	39,638,000	3,672,000	10,304,000
	Percentage with Dental Care ^a			
<i>Type of Dental Care</i>				
Any Type ^b	49.14 [*] (1.17)	55.02 (1.25)	21.69 [*] (2.05)	12.33 (1.28)
Diagnostic or Preventive ^c	45.21 [*] (1.11)	51.39 (1.30)	18.29 [*] (2.06)	8.41 (1.16)
Restorative or Endodontic ^d	16.66 [*] (0.74)	19.53 (0.90)	N.A.	N.A.
Periodontic ^e	2.07 [*] (0.26)	3.35 (0.40)	N.A.	N.A.
Oral Surgery ^f	5.37 [*] (0.41)	8.30 (0.69)	3.58 (0.96)	3.21 (0.76)
Prosthetics ^g	2.17 [*] (0.25)	4.67 (0.50)	8.00 (1.41)	6.41 (1.02)
Other ^h	2.13 (0.27)	2.97 (0.36)	N.A.	N.A.

Standard errors are in parentheses and account for sample design. Results are weighted. Based on a sample of 8,254 dentate persons, 3,285 of whom on Medicare, and 1,363 edentulous persons, 972 of whom on Medicare.

^{*} Indicates statistically significant difference at least at the .01 level from the percentage for the respective Medicare population.

[#] Indicates that estimate is based on fewer than 100 observations.

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N.A. Indicates not applicable.

^aIndicates the percentage with at least one visit of a given type during the year.

^bIndicates at least one dental visit for any reason during the year.

^cIncludes general exam, checkup, consultation; cleaning, prophylaxis, polishing; x-rays, radiographs, or bitewings; fluoride treatment; and sealant.

^dIncludes fillings, inlays, crowns or caps, and root canal.

^eIncludes periodontal scaling, root planing or gum surgery; and periodontal recall visit (periodic or regular).

^fIncludes extraction (tooth pulled), implants, abscess or infection treatment, and other oral surgery.

^gIncludes fixed bridges, dentures or removable partial dentures, and relining or repair of bridges or dentures.

^hIncludes other specified not assigned to specific type of service.

Table 2.

Percentage of Dentate Individuals 50 Years and Older with Dental Use and Percentage of Dentate Dental Patients by Type of Dental Services by Population Characteristic: United States: Medical Expenditure Panel Survey, 2014

Population Characteristic	Total Population (millions)	Percent With 1 or More Dental Events	Percent of Dental Patients with Service of Specific Type Conditional on Any Dental Use					
			Diagnostic or Preventive ^c	Restorative or Endodontic ^d	Periodontic ^e	Oral Surgery ^f	Prosthetics ^g	Other ^h
Total	94.771	51.60 (0.95)	92.62 (0.53)	34.61 (1.06)	5.04 (0.44)	12.78 (0.60)	6.24 (0.51)	6.43 (0.47)
Age/Medicare Status								
No Medicare	55.132	49.14 [*] (1.15)	92.00 (0.68)	33.90 (1.38)	4.21 ^{2,4} (0.52)	10.93 ^{2,3,4} (0.75)	4.43 ^{2,4,5} (0.48)	6.34 (0.63)
Medicare	39.639	55.02 (1.26)	93.40 (0.72)	35.49 (1.53)	6.08 (0.73)	15.08 (1.15)	8.49 (0.87)	6.54 (0.69)
50–64	4.029	32.74 ^{4,5} (3.08)	82.31 ^{4,5} (5.06)	34.71 (5.00)	2.11 ⁴ (1.31)	25.40 ⁴ (4.48)	9.81 (3.37)	6.52 (3.49)
65–74	22.230	57.74 (1.62)	93.72 (0.95)	35.99 (1.89)	7.36 (1.06)	12.45 ⁵ (1.26)	8.06 (1.07)	6.78 (0.87)
75+	13.380	57.23 (1.89)	94.79 (1.02)	34.77 (2.63)	4.63 (0.93)	17.70 (2.22)	8.97 (1.43)	6.10 (1.33)
Sex								
Men	44.787	48.44 [*] (1.17)	91.99 (0.77)	35.98 (1.66)	5.37 (0.62)	13.10 (0.89)	5.90 (0.69)	5.52 (0.72)
Women	49.983	54.44 (1.09)	93.13 (0.68)	33.51 (1.28)	4.79 (0.68)	12.52 (0.84)	6.50 (0.72)	7.16 (0.69)
Race/Ethnicity								
White, non-Hispanic	69.014	57.80 [*] (1.12)	93.53 [*] (0.58)	35.46 ^{2,3} (1.30)	4.69 (0.49)	11.74 [*] (0.68)	5.77 ² (0.61)	6.35 (0.52)
Black, non-Hispanic	9.343	33.57 ⁴ (1.55)	88.79 (1.32)	25.80 1.89)	7.49 (1.37)	16.45 (1.89)	9.34 (1.24)	6.10 (1.53)
Hispanic	9.743	30.25 (1.67)	89.81 (1.38)	29.95 (2.16)	6.24 (2.03)	16.35 (1.96)	7.94 (1.41)	7.77 (1.63)
Other, non-Hispanic	6.671	43.97 (2.22)	87.19 (2.80)	37.12 (3.82)	6.00 (1.69)	19.30 (2.61)	7.63 (1.61)	6.62 (1.56)
Educational Attainment								

Less Than High School Degree	9.674	22.75 [*] (1.44)	86.79 [*] (2.15)	40.53 (4.03)	3.18 (1.69)	24.65 [*] (3.32)	11.15 (2.10)	5.08 (2.01)
High School Degree	53.813	48.34 ³ (1.15)	91.35 ³ (0.81)	35.91 (1.39)	4.58 (0.48)	14.92 ³ (0.98)	7.47 (0.83)	6.33 (0.69)
College Degree and Beyond	30.775	66.83 (1.46)	94.89 (0.64)	32.30 (1.56)	5.85 (0.74)	8.80 (0.87)	4.19 [*] (0.71)	6.75 (0.74)
Population Characteristic	Total Population (millions)	Percent With 1 or More Dental Events	Percent of Dental Patients with Service of Specific Type Conditional on Any Dental Use					
			Diagnostic or Preventive^c	Restorative or Endodontic^d	Periodontic^e	Oral Surgery^f	Prosthetics^g	Other^h
Marital Status								
Married	60.301	54.63 ² (1.21)	93.61 ² (0.57)	35.20 (1.24)	5.08 (0.57)	11.42 ² (0.73)	4.99 ² (0.53)	5.87 (0.58)
Widowed, Divorced, Separated	27.410	47.15 ³ (1.32)	90.20 (1.15)	32.36 (2.09)	5.11 (0.85)	15.96 (1.54)	8.94 (1.28)	7.54 (1.11)
Never Married	7.052	43.05 (2.18)	92.28 (1.66)	37.67 (3.39)	4.35 (1.46)	13.93 (2.47)	8.27 (1.72)	7.78 (2.02)
Health Status								
Excellent, Very Good	50.846	57.82 (1.19)	93.83 (0.64)	33.09 ³ (1.35)	5.21 (0.52)	9.72 [*] (0.84)	4.92 ³ (0.59)	6.78 (0.63)
Good	28.100	48.77 ³ (1.39)	92.39 ³ (0.98)	34.75 ³ (1.74)	4.85 (0.75)	15.56 ³ (1.21)	7.39 (1.07)	5.89 (0.83)
Fair, Poor	15.818	36.68 (1.62)	87.07 (1.80)	41.92 (2.98)	4.66 (1.31)	21.68 (2.25)	10.20 (1.68)	5.95 (1.10)
Dental Insurance								
Covered	49.088	69.60 [*] (1.11)	93.73 [*] (0.57)	35.51 (1.25)	5.62 [*] (0.59)	11.98 (0.70)	5.57 (0.54)	6.83 (0.62)
Not Covered	45.682	32.26 (1.23)	90.06 (1.19)	32.50 (1.72)	3.70 (0.60)	14.62 (1.38)	7.79 (1.02)	5.52 (0.80)
Retirement/Labor Force Status								
Not Retired, In the Labor Force	53.244	51.66 [*] (1.11)	93.30 ³ (0.67)	33.80 (1.33)	5.06 ³ (0.63)	10.63 [*] (0.78)	5.05 ³ (0.59)	6.47 (0.70)
Retired	24.673	61.19 ³ (1.57)	93.38 ³ (0.98)	35.51 (1.90)	5.97 ³ (0.96)	14.36 (1.30)	6.98 (0.97)	6.18 (0.82)

Not Retired, Not in the Labor Force	9.518	36.35 (2.14)	88.01 (2.28)	34.86 (3.33)	2.13 (0.72)	19.14 (2.68)	9.81 (2.28)	8.38 (2.01)
Family Income^a								
Poor	8.543	31.02 ³ (2.18)	86.84 ³ (2.75)	29.59 (3.05)	1.82 ³ (0.68)	21.39 (3.23)	11.19 (2.56)	3.45 ^{3,4} (1.20)
Low Income	14.251	35.94 (1.80)	90.22 (1.68)	34.59 (3.03)	4.57 (1.32)	19.86 (2.64)	8.87 (1.73)	6.45 (1.39)
Middle Income	24.022	45.34 (1.43)	90.26 (1.20)	34.77 (2.03)	3.43 ⁴ (0.60)	17.49 (1.67)	9.31 (1.36)	7.20 (0.95)
High Income	47.955	63.06 [*] (1.35)	94.39 (0.63)	34.99 (1.30)	5.99 (0.61)	9.12 [*] (0.65)	4.25 [*] (0.54)	6.41 (0.66)
Frequency of Dental Checkups								
Twice a Year or More	46.567	81.26 [*] (0.94)	95.69 [*] (0.47)	34.60 (1.26)	5.66 [*] (0.56)	9.49 [*] (0.65)	5.19 ³ (0.58)	6.38 (0.54)
Once a Year	18.860	39.95 ^{3,4} (1.63)	85.69 ³ (1.73)	37.05 (2.56)	3.10 (1.01)	19.02 ^{3,4} (1.74)	6.72 ³ (1.22)	7.31 (1.26)
Population Characteristic	Total Population (millions)	Percent With 1 or More Dental Events	Percent of Dental Patients with Service of Specific Type Conditional on Any Dental Use					
			Diagnostic or Preventive^c	Restorative or Endodontic^d	Periodontic^e	Oral Surgery^f	Prosthetics^g	Other^h
Less than Once a Year	16.151	17.97 ⁴ (1.33)	74.71 (3.92)	29.81 (4.03)	2.11 (1.09)	32.68 (3.82)	16.36 (3.09)	5.23 (1.65)
Never Goes to Dentist	12.645	4.54 (0.77)	71.23 [#] (8.43)	24.50 [#] (7.16)	1.56 [#] (1.56)	47.91 [#] (8.78)	18.46 [#] (6.94)	4.90 [#] (4.74)
Mental Health Status								
Excellent or Very Good	60.211	56.56 [*] (1.18)	93.57 ² (0.60)	33.79 ² (1.22)	5.42 ² (0.55)	10.98 [*] (0.78)	4.93 [*] (0.53)	6.62 (0.57)
Good	25.796	43.82 (1.38)	90.66 (1.11)	37.56 (2.01)	3.37 (0.63)	15.16 ³ (1.24)	9.04 (1.26)	5.55 (0.78)
Fair or poor	8.737	40.57 (2.15)	89.75 (2.08)	33.05 (3.68)	6.72 (2.16)	22.45 (3.15)	9.80 (2.40)	7.45 (1.89)
Census Region								
Northeast	17.146	53.82 ^{2,3} (1.92)	92.90 (1.35)	36.77 (2.86)	4.55 (1.42)	12.54 (1.38)	6.90 (1.42)	6.03 (0.74)

Midwest	21.299	58.51 ³ (1.99)	94.47 (0.96)	35.20 (2.12)	4.28 (0.66)	10.06 ⁴ (1.01)	6.00 (0.97)	6.83 (1.11)
South	34.827	44.04 ⁴ (1.65)	90.87 (0.93)	31.87 (1.66)	5.47 (0.74)	13.81 (1.21)	6.68 (1.04)	5.82 (0.82)
West	21.498	55.25 (1.73)	92.74 (1.08)	35.83 (1.90)	5.68 (0.96)	14.48 (1.27)	5.39 (0.66)	7.13 (0.90)
Family Size								
One Person	21.781	50.81 [*] (1.44)	91.87 (1.10)	33.25 (1.97)	4.97 (0.83)	15.24 ³ (1.40)	9.11 [*] (1.24)	8.12 ³ (1.24)
Two Persons	46.797	57.64 ³ (1.24)	93.61 (0.67)	36.32 (1.51)	5.08 (0.62)	12.57 (0.90)	5.60 (0.63)	6.52 ³ (0.68)
Three or More Persons	26.193	41.48 (1.57)	90.94 (1.26)	31.73 (2.11)	5.02 (0.94)	10.78 (1.07)	4.89 (0.89)	4.50 (0.75)
Physical Functioning								
Limitations	21.242	47.74 [*] (1.49)	90.22 [*] (1.33)	39.75 [*] (2.38)	5.58 (1.06)	17.88 [*] (1.53)	9.21 [*] (1.29)	6.25 (1.00)
Not Limited	73.502	52.74 (1.11)	93.25 (0.54)	33.26 (1.13)	4.91 (0.48)	11.44 (0.67)	5.46 (0.50)	6.48 (0.52)
Number of Observations^b	8,254	3,535	3,234	1,200	181	527	254	235

Standard errors are in parentheses and account for sample design. Results are weighted.

[#] Indicates that estimate is based on fewer than 100 observations.

¹ Indicates significantly different from first characteristic listed in group ($P \leq .05$)

² Indicates significantly different from second characteristic listed in group ($P \leq .05$)

³ Indicates significantly different from third characteristic listed in group ($P \leq .05$)

⁴ Indicates significantly different from fourth characteristic listed in group ($P \leq .05$)

⁵ Indicates significantly different from fifth characteristic listed in group ($P \leq .05$)

^{*} Indicates significantly different from all other characteristics listed in group ($P \leq .05$)

^a Low income refers to persons in families with incomes 101% to 200% of the poverty line; middle income, 201% to 400% of the poverty line, and high income > 400% of the poverty line. Poor persons were at or <100% of the poverty line including persons in families with negative income.

q Unweighted sample sizes. The sample size in the first column is the number of persons 50 years and older, not missing all of their teeth, and with positive-valued weights, 3535 among whom had at least one dental event during the year. Sample sizes in remaining columns are numbers with at least one event of dental service type.

c Includes general exam, checkup, consultation; cleaning, prophylaxis, polishing; x-rays, radiographs, or bitewings; fluoride treatment; and sealant.

d Includes fillings, inlays, crowns or caps, and root canal.

e Includes periodontal scaling, root planing or gum surgery; and periodontal recall visit (periodic or regular).

f Includes extraction, tooth pulled, implants, abscess or infection treatment, and other oral surgery.

g Includes fixed bridges, dentures or removable partial dentures, and relining or repair of bridges or dentures.

h Includes orthodontia, braces, or retainers; bond, whiten, or bleach, treatment for TMD (temporomandibular disorders) or TMJ (temporomandibular joint disorders); and other specified not assigned to specific type of service.

Table 3.

Adjusted Odds Ratios from Logistic Regressions for Likelihood of Dental Care by Type of Service: Dentate Individuals 50 Years and Older: United States, Medical Expenditure Panel Survey, 2014

Population Characteristic	All Dentate Individuals		Type of Dental Service for Dental Patients Conditional on Any Dental Use ^b				
	Any Dental Use	Diagnostic or Preventive ^c	Restorative or Endodontic ^d	Periodontic ^e	Oral Surgery ^f	Prosthetics ^g	Other ^h
<i>Age/Medicare Status</i>							
No Medicare (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50–64	1.52* (1.00, 2.31)	0.94 (0.35, 2.56)	0.85 (0.49, 1.47)	1.36 (0.30, 6.12)	1.57 (0.73, 3.38)	0.98 (0.34, 2.81)	1.06 (0.32, 3.51)
65–74	1.87** (1.43, 2.46)	1.81* (1.15, 2.87)	1.03 (0.78, 1.36)	2.38** (1.44, 3.93)	1.15 (0.83, 1.59)	2.23** (1.43, 3.49)	1.07 (0.75, 1.52)
75+	1.89** (1.33, 2.68)	2.97** (1.62, 5.47)	0.97 (0.71, 1.33)	1.60 (0.82, 3.10)	1.57 (0.97, 2.56)	2.44** (1.41, 4.23)	0.94 (0.45, 1.95)
<i>Sex</i>							
Men (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Women	1.10 (0.94, 1.29)	1.36 (0.97, 1.90)	0.86 (0.71, 1.33)	0.93 (0.60, 1.43)	0.90 (0.70, 1.17)	1.01 (0.69, 1.48)	1.30 (0.89, 1.91)
<i>Race/Ethnicity</i>							
White, non-Hispanic (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Black, non-Hispanic	0.55** (0.44, 0.69)	0.81 (0.53, 1.23)	0.60** (0.47, 0.78)	1.73* (1.01, 2.94)	1.20 (0.85, 1.68)	1.54* (1.00, 2.35)	0.92 (0.49, 1.73)
Hispanic	0.66** (0.51, 0.86)	1.19 (0.73, 1.94)	0.72* (0.53, 0.97)	2.00 (0.90, 4.45)	1.07 (0.70, 1.63)	1.30 (0.71, 2.40)	1.41 (0.83, 2.38)
Other, non-Hispanic	0.81 (0.54, 1.22)	0.69 (0.35, 1.35)	1.08 (0.74, 1.58)	1.09 (0.55, 2.15)	1.63* (1.07, 2.47)	1.33 (0.75, 2.38)	1.06 (0.60, 1.85)
<i>Educational Attainment</i>							
Less Than High School Degree	0.57** (0.43, 0.76)	0.65 (0.35, 1.22)	1.88** (1.22, 2.88)	0.82 (0.22, 3.08)	2.04** (1.25, 3.32)	1.60 (0.78, 3.26)	0.77 (0.27, 2.22)
High School Degree	0.87 (0.72, 1.07)	0.70 (0.49, 1.01)	1.30** (1.07, 1.58)	0.98 (0.69, 1.40)	1.41* (1.04, 1.92)	1.33 (0.85, 2.09)	0.93 (0.65, 1.33)
College Degree + (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00

J Public Health Dent. Author manuscript; available in PMC 2020 March 01.

High Income	0.96 (0.71, 1.30)	0.75 (0.38, 1.45)	1.62 [*] (1.08, 2.44)	2.55 (0.99, 6.58)	0.77 (0.43, 1.37)	0.63 (0.33, 1.20)	2.63 (0.96, 7.20)
Frequency of Dental Checkups							
Twice a Year or More (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Once a Year	0.18 ^{**} (0.15, 0.22)	0.29 ^{**} (0.19, 0.43)	1.15 (0.88, 1.52)	0.50 (0.24, 1.06)	2.03 ^{**} (1.49, 2.77)	1.17 (0.72, 1.92)	1.19 (0.78, 1.83)
Less than Once a Year	0.06 ^{**} (0.05, 0.07)	0.15 ^{**} (0.09, 0.24)	0.78 (0.50, 1.20)	0.39 (0.11, 1.33)	4.44 ^{**} (2.90, 6.81)	2.85 ^{**} (1.72, 4.68)	0.88 (0.42, 1.84)
Never Goes to Dentist	0.02 ^{**} (0.01, 0.02)	0.15 ^{**} (0.07, 0.36)	0.47 (0.20, 1.11)	0.34 (0.04, 2.68)	7.10 ^{**} (3.38, 14.88)	2.81 (0.99, 7.98)	0.97 (0.15, 6.22)
Mental Health Status							
Excellent or Very Good (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Good	0.92 (0.73, 1.16)	1.12 (0.73, 1.70)	0.97 (0.76, 1.24)	0.68 (0.40, 1.16)	0.78 (0.56, 1.09)	1.30 (0.84, 2.01)	0.82 (0.54, 1.23)
Fair or poor	1.30 (0.92, 1.84)	1.19 (0.65, 2.18)	0.69 (0.44, 1.09)	1.80 (0.50, 6.45)	1.11 (0.62, 2.00)	1.40 (0.71, 2.75)	1.23 (0.55, 2.75)
Type of Dental Service for Dental Patients Conditional on Any Dental Use^b							
Population Characteristic	Any Dental Use	Diagnostic or Preventive^c	Restorative or Endodontic^d	Periodontic^e	Oral Surgery^f	Prosthetics^g	Other^h
Census Region							
Northeast	1.22 (0.92, 1.62)	1.16 (0.67, 1.99)	1.23 (0.93, 1.62)	0.73 (0.33, 1.61)	1.05 (0.73, 1.52)	1.28 (0.71, 2.32)	1.06 (0.71, 1.58)
Midwest	1.60 ^{**} (1.22, 2.11)	1.59 [*] (1.01, 2.49)	1.10 (0.86, 1.41)	0.80 (0.51, 1.25)	0.72 (0.51, 1.02)	0.97 (0.58, 1.65)	1.19 (0.73, 1.92)
South (Ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
West	1.64 ^{**} (1.26, 2.14)	1.36 (0.87, 2.11)	1.14 (0.90, 1.43)	1.08 (0.67, 1.74)	1.06 (0.78, 1.44)	0.88 (0.54, 1.42)	1.25 (0.81, 1.91)
Family Size							
One Person	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Two Persons	0.94 (0.73, 1.21)	0.76 (0.50, 1.18)	1.16 (0.85, 1.59)	1.10 (0.61, 1.99)	1.16 (0.79, 1.72)	1.10 (0.62, 1.94)	0.89 (0.51, 1.56)
Three or More Persons	0.53 ^{**} (0.40, 0.70)	0.56 (0.30, 1.05)	0.94 (0.65, 1.35)	1.35 (0.62, 2.93)	0.95 (0.62, 1.46)	1.06 (0.58, 1.96)	0.57 (0.32, 1.02)
Physical Functioning							

Limitations	1.14 (0.92, 1.41)	0.77 (0.51, 1.16)	1.19 (0.93, 1.52)	1.48 (0.89, 2.45)	1.14 (0.82, 1.60)	1.06 (0.71, 1.59)	0.97 (0.63, 1.49)
Not Limited	1.00	1.00	1.00	1.00	1.00	1.00	1.00

95% Confidence Intervals are in parentheses and are based on weighted data and account for the sample design. The adjusted value refers to the inclusion in the regression of the control variables listed in the rows of the table. The adjusted odds ratio is an estimate of [probability of dental use/probability of no dental use] for persons with row characteristic divided by [probability of dental use/probability of no dental use] for persons in the reference group (Ref.). The unweighted sample size for the logistic regression for any dental use was 7,244 dentate individuals after excluding persons with missing data. The unweighted sample size for each of the logistic regressions for dental service type was 3,259 dentate individuals with at least one dental visit during the year regardless of the type of dental visit.

* Indicates statistical significance at the 5% level.
** Indicates statistical significance at the 1% level.

- ^aLow income refers to persons in families with incomes 101% to 200% of the poverty line; middle income, 201% to 400% of the poverty line, and high income > 400% of the poverty line. Poor persons were at or <100% of the poverty line including persons in families with negative income.
- ^bEstimates of likelihood that a dentate patient will have at least one dental visit during the year of a specified type.
- ^cIncludes general exam, checkup, consultation; cleaning, prophylaxis, polishing; x-rays, radiographs, or bitewings; fluoride treatment; and sealant.
- ^dIncludes fillings, inlays, crowns or caps, and root canal.
- ^eIncludes periodontal scaling, root planing or gum surgery; and periodontal recall visit (periodic or regular).
- ^fIncludes extraction (tooth pulled), implants, abscess or infection treatment, and other oral surgery.
- ^gIncludes fixed bridges, dentures or removable partial dentures, and relining or repair of bridges or dentures.
- ^hIncludes orthodontia, braces, or retainers; bond, whiten, or bleach; treatment for TMD (temporomandibular disorders) or TMJ (temporomandibular joint disorders; and other specified not assigned to specific type of service.

Table 4.

Adjusted Odds Ratios from Logistic Regressions for Likelihood of Dental Care by Type of Service: Edentulous Individuals 50 Years and Older: United States, Medical Expenditure Panel Survey, 2014

Population Characteristic	All Edentulous Individuals		Type of Dental Service for Dental Patients Conditional on Any Dental Use ^b		
	Any Dental Use	Diagnostic or Preventive ^c	Oral Surgery ^d	Prosthetics ^e	
Age/Medicare Status					
No Medicare (Ref.)	1.00	1.00	1.00	1.00	
50–64	2.54 (0.95, 6.80)	0.05** (0.01, 0.19)	0.27* (0.07, 0.96)	0.17* (0.04, 0.72)	
65–74	1.95 (0.97, 3.93)	0.37 (0.12, 1.08)	0.69 (0.23, 2.03)	1.72 (0.61, 4.86)	
75+	1.40 (0.61, 3.21)	6.68* (1.20, 37.15)	0.07** (0.01, 0.33)	1.13 (0.35, 3.65)	
Sex					
Men (Ref.)	1.00	1.00	1.00	1.00	
Women	1.86* (1.08, 3.20)	1.23 (0.47, 3.22)	0.76 (0.34, 1.72)	0.31** (0.15, 0.64)	
Race/Ethnicity					
White, non-Hispanic (Ref.)	1.00	1.00	1.00	1.00	
Black, non-Hispanic	0.43* (0.23, 0.82)	2.19 (0.63, 7.65)	1.32 (0.34, 5.13)	0.44 (0.14, 1.35)	
Hispanic	0.42* (0.21, 0.84)	0.42 (0.03, 5.85)	1.97 (0.77, 4.82)	0.40* (0.16, 0.96)	
Other, non-Hispanic	0.51 (0.20, 1.26)	0.78 (0.27, 2.22)	1.94 (0.69, 5.42)	0.32 (0.08, 1.19)	
Educational Attainment					
Less Than High School Degree	0.40 (0.14, 1.10)	0.74 (0.33, 1.64)	4.32 (0.88, 21.14)	4.79** (1.59, 14.48)	
High School Degree	0.52 (0.22, 1.25)	0.48 (0.19, 1.23)	7.02** (1.78, 27.63)	5.60** (2.15, 14.57)	
College Degree + (Ref.)	1.00	1.00	1.00	1.00	
Marital Status					

Married (Ref.)	1.00	1.00	1.00	1.00	1.00
Widowed, Divorced, Separated	0.64 (0.33, 1.27)	1.82 (0.53, 6.24)	1.02 (0.28, 3.75)	1.16 (0.38, 3.58)	
Never Married	1.40 (0.53, 3.72)	5.50** (2.26, 13.35)	0.74 (0.17, 3.28)	2.42 (0.73, 8.00)	
Population Characteristic	Type of Dental Service for Dental Patients Conditional on Any Dental Use ^b				
	Any Dental Use	Diagnostic or Preventive ^c	Oral Surgery ^d	Prosthetics ^e	
Health Status					
Excellent, Very Good (Ref.)	1.00	1.00	1.00	1.00	
Good	0.95 (0.45, 1.98)	0.38* (0.14, 0.98)	0.53 (0.23, 1.21)	1.05 (0.54, 2.03)	
Fair, Poor	1.32 (0.59, 2.92)	0.48 (0.14, 1.69)	0.68 (0.19, 2.49)	3.59* (1.26, 10.21)	
Dental Insurance					
Covered	8.61** (4.45, 16.63)	2.19 (0.94, 5.12)	1.63 (0.79, 3.36)	0.81 (0.38, 1.71)	
Not Covered (Ref.)	1.00	1.00	1.00	1.00	
Retirement/Labor Force Status					
Not Retired, In the Labor Force (Ref.)	1.00	1.00	1.00	1.00	
Retired	1.16 (0.59, 2.28)	0.67 (0.27, 1.67)	22.91** (8.23, 63.77)	0.86 (0.43, 1.74)	
Not Retired, Not in the Labor Force	1.37 (0.55, 3.44)	11.71** (4.34, 31.59)	2.32 (0.89, 6.04)	1.26 (0.50, 3.17)	
Family Income^a					
Poor (Ref.)	1.00	1.00	1.00	1.00	
Low Income	0.69 (0.34, 1.38)	0.86 (0.23, 3.23)	1.61 (0.48, 5.34)	0.38* (0.15, 0.95)	
Middle Income	0.42 (0.19, 0.94)	0.45 (0.10, 1.94)	0.88 (0.20, 3.83)	0.29* (0.09, 0.93)	
High Income	0.49 (0.18, 1.34)	8.77* (1.46, 52.63)	0.33 (0.08, 1.33)	0.04** (0.01, 0.12)	

<i>Frequency of Dental Checkups</i>					
Twice a Year or More (Ref.)	1.00	1.00	1.00	1.00	1.00
Once a Year	0.16** (0.06, 0.39)	0.35 (0.12, 1.05)	0.23** (0.13, 0.40)	0.69 (0.33, 1.46)	
Less than Once a Year	0.07** (0.03, 0.15)	0.27 (0.06, 1.34)	1.19 (0.59, 2.40)	3.64* (1.21, 10.93)	
Never Goes to Dentist	0.02** (0.01, 0.05)	0.03** (0.01, 0.14)	0.46 (0.21, 1.01)	1.33 (0.46, 3.84)	
<i>Mental Health Status</i>					
Excellent or Very Good (Ref.)	1.00	1.00	1.00	1.00	1.00
Good	0.71 (0.34, 1.47)	1.20 (0.42, 3.38)	0.45 (0.20, 1.01)	1.36 (0.66, 2.80)	
Fair or poor	1.32 (0.59, 2.99)	0.59 (0.26, 1.34)	0.59 (0.24, 1.42)	0.66 (0.22, 1.98)	
All Edentulous Individuals		Type of Dental Service for Dental Patients Conditional on Any Dental Use^b			
Population Characteristic		Any Dental Use	Diagnostic or Preventive^c	Oral Surgery^e	Prosthetics^f
<i>Census Region</i>					
Northeast	0.94 (0.47, 1.90)	0.45 (0.19, 1.08)	1.15 (0.50, 2.64)	2.23 (0.80, 6.21)	
Midwest	1.51 (0.74, 3.05)	3.14 (0.99, 9.90)	1.34 (0.47, 3.87)	0.85 (0.34, 2.12)	
South (Ref.)	1.00	1.00	1.00	1.00	1.00
West	2.37* (1.11, 5.06)	0.83 (0.19, 3.56)	0.20** (0.08, 0.52)	1.11 (0.51, 2.44)	
<i>Family Size</i>					
One Person	1.00	1.00	1.00	1.00	1.00
Two Persons	0.46 (0.20, 1.07)	1.26 (0.48, 3.29)	0.90 (0.26, 3.06)	2.93 (0.92, 9.31)	
Three or More Persons	0.44* (0.20, 0.94)	0.48 (0.19, 1.26)	0.67 (0.22, 2.04)	1.67 (0.52, 5.38)	
<i>Physical Functioning</i>					
Limitations	0.70 (0.35, 1.41)	0.82 (0.38, 1.75)	2.14* (1.02, 4.48)	1.84 (0.88, 3.83)	

	1.00	1.00	1.00	1.00	Not Limited
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95% Confidence Intervals are in parentheses and are based on weighted data and account for the sample design. The adjusted value refers to the inclusion in the regression of the control variables listed in the rows of the table. The adjusted odds ratio is an estimate of [probability of dental use/probability of no dental use] for persons with row characteristic divided by [probability of dental use/probability of no dental use] for persons in the reference group (Ref.). The unweighted sample size for the logistic regression for any dental use is 1,068 edentulous individuals after excluding persons with missing data. The unweighted sample size for each of the logistic regressions for dental service type is 160 edentulous individuals with at least one dental visit during the year regardless of the type of dental visit.

* Indicates statistical significance at the 5% level.
** Indicates statistical significance at the 1% level.

^aLow income refers to persons in families with incomes 101% to 200% of the poverty line; middle income, 201% to 400% of the poverty line, and high income > 400% of the poverty line. Poor persons were at or <100% of the poverty line including persons in families with negative income.

^bEstimates of likelihood that an edentulous patient will have at least one dental visit during the year of a specified type.

^cIncludes general exam, checkup, consultation; cleaning, prophylaxis, polishing; x-rays, radiographs, or bitewings; fluoride treatment; and sealant.

^dIncludes extraction (tooth pulled), implants, abscess or infection treatment, and other oral surgery.

^eIncludes fixed bridges, dentures or removable partial dentures, and relining or repair of bridges or dentures.

Table 5.

Adjusted Odds Ratios for Having No Preventive Dental Care from Logistic Regressions for Likelihood of Dental Care by Type of Service: Dentate and Edentulous Patients 50 Years and Older: United States, Medical Expenditure Panel Survey, 2014

Type of Dental Patient	Type of Dental Service for Dental Patients Conditional on Any Dental Use ^a			
	Restorative or Endodontic ^b	Periodontic ^c	Oral Surgery ^d	Prosthetics ^e
Dentate	2.93 ^{***} (2.07, 4.16)	0.67 (0.27, 1.69)	3.74 ^{***} (2.58, 5.47)	3.68 ^{***} (2.20, 6.13)
Edentulous	N.A.	N.A.	0.91 (0.38, 2.16)	6.22 ^{***} (2.56, 15.07)

95% Confidence Intervals are in parentheses and are based on weighted data and account for the sample design. Preventive dental care includes having at least one dental event during the year involving any of the following: general exam, checkup, consultation; cleaning, prophylaxis, polishing; x-rays, radiographs, or bitewings; fluoride treatment; and sealant. The adjusted value refers to the inclusion in the regression of the control variables listed in the rows of Tables 3 and 4. The adjusted odds ratio is an estimate of [probability of dental use of given type/probability of no dental use of given type] for persons without preventive dental use divided by [probability of dental use of given type/probability of no dental use of given type] for persons with preventive dental use. The unweighted sample size for each of the logistic regressions for dental service type is 3,259 for dentate and 160 for edentulous individuals each with at least one dental visit during the year regardless of the type of dental visit.

* Indicates statistical significance at the 5% level.

** Indicates statistical significance at the 1% level.

N.A. indicates not applicable.

^a Estimates of likelihood that a dental patient will have at least one dental visit during the year of a specified type.

^b Includes fillings, inlays, crowns or caps, and root canal.

^c Includes periodontal scaling, root planing or gum surgery; and periodontal recall visit (periodic or regular).

^d Includes extraction (tooth pulled), implants, abscess or infection treatment, and other oral surgery.

^e Includes fixed bridges, dentures or removable partial dentures, and relining or repair of bridges or dentures.