



Published in final edited form as:

J Am Dent Assoc. 2022 June ; 153(6): 563–571.e2. doi:10.1016/j.adaj.2021.12.012.

Dental health status, use, and insurance coverage among adults with chronic conditions:

Implications for medical-dental integration in the United States

Mr. Liang Wei, MS, MPH [statistician],

DB Consulting Group, Atlanta, GA.

Dr. Susan O. Griffin, PhD [health economist],

Division of Oral Health, Centers for Disease Control and Prevention, 4770 Buford Hwy, MS 107-8, Atlanta, GA 30341

Dr. Marcia Parker, DMD, MPH [public health advisor],

Division of Oral Health, Centers for Disease Control and Prevention, Atlanta, GA.

Dr. Gina Thornton-Evans, DDS, MPH [dental officer]

Division of Oral Health, Centers for Disease Control and Prevention, Atlanta, GA.

Abstract

Background.—The authors examined potential benefits and difficulties in integrating oral health care and medical care for adults with chronic conditions (CCs).

Methods.—The authors used National Health and Nutrition Examination Survey 2009–2016 data to estimate crude (age- and sex-standardized) and model-adjusted estimates to examine the association between dental disease (severe tooth loss, untreated caries) and chronic disease (≥ 3 CCs, fair or poor health) and Medical Expenditure Panel Survey 2014–2016 data to estimate crude estimates of past-year medical and dental use and financial access according to CC status. Reported differences are significant at $P < .05$.

Results.—National prevalences of reporting fair or poor health and 3 or more CCs were both approximately 15%. Standardized prevalence of dental disease was notably higher among adults reporting CCs than those not reporting. After controlling for covariates, the magnitude of the association was substantially lower, although the association remained significant. Adults with CCs were approximately 50% more likely to report having a past-year medical visit and no dental visit than those not reporting CCs. Among adults reporting CCs, prevalence of having no private dental insurance and low income was approximately 20% and 60% higher, respectively, than that among adults not reporting CCs.

Address correspondence to Dr. Griffin. sig1@cdc.gov.

SUPPLEMENTAL DATA

Supplemental data related to this article can be found at: <https://doi.org/10.1016/j.adaj.2021.12.012>.

Disclosure. None of the authors reported any disclosures.

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.

Conclusions.—Adults with CCs had higher prevalence of dental disease, past-year medical visit and no dental visit, and limited financial access.

Practical Implications.—Medical visits may be the only opportunity to provide dental education and referrals to adults with CCs. Improved medical-dental integration could improve oral health care access and oral health among these adults who are at higher risk of dental disease.

Keywords

Medical and dental integration; caries; tooth loss

Oral health is integral to general health.¹ However, segments of the US population, including many adults with chronic conditions (CCs), lack access to oral health care.^{1–3} Investigators have found that CCs are associated with higher levels of unmet dental treatment needs and severe tooth loss.^{4,5} This could be due to adults with CCs having lower dental care use⁶ and less knowledge about the benefits of effective preventive dental behaviors,^{7,8} including toothbrushing with fluoride toothpaste and routine receipt of clinical oral health care services.^{9–11}

Poor oral health can diminish quality of life by means of limiting ability to eat healthy foods and impeding social interaction.¹ Preventing dental disease among people with CCs could also improve health outcomes and save money. Results of a Cochrane Review found evidence that treating periodontitis improved glycemic control among adults with type 2 diabetes,¹² and in another study, investigators found that having periodontitis was associated with higher medical costs among people with coronary artery disease, cerebral vascular disease, and type 2 diabetes.¹³ Some insurance companies now cover periodontal treatment with no copay for people with CCs.⁸ Although the National Academy of Medicine has proposed better integration of oral health care and medical care to expand access to oral health care,^{2,3} the 2 systems remain largely segregated, except for some efforts among pediatric populations, managed care, and community health centers.¹⁴

In our study, we examined the potential benefits and difficulties in integrating oral health care services into primary care visits for adults older than 20 years with CCs. Using national data, we had 3 study objectives: (1) examine whether adults with CCs still have higher prevalence of dental disease, (2) estimate the percentage of adults who could potentially benefit from integration (that is, percentage with past-year medical visit and no dental visit), and (3) estimate financial access to oral health care among people with CCs as a gauge of the potential capacity for improved use of clinical oral health care.

METHODS

Data sources

This analysis was conducted in 2020 and 2021. We used cross-sectional deidentified data from the National Health and Nutrition Examination Survey (NHANES) and the Medical Expenditure Panel Survey (MEPS). Both surveys are complex multistage samples of the noninstitutionalized US population. NHANES includes an interview in the respondent's home and a visual and tactile dental examination performed by dentists in a mobile

examination center. NHANES dentists are periodically monitored during the data collection process to ensure consistent assessment standards. NHANES protocols were approved by the National Center for Health Statistics Ethics Review Board. Additional information on NHANES is available at <http://www.cdc.gov/nchs/nhanes.htm>. MEPS includes a household component in which respondents are interviewed regarding health care use (including dental) and health insurance coverage (including private dental) approximately every 3 months (5 times during a 15-month period). MEPS has been reviewed and received approval from the Westat Institutional Review Board, established under a multiproject assurance (MPA M-1531) granted by the Office for Protection from Research Risks. The project is reviewed and renewed annually. Additional information on MEPS is available at https://meps.ahrq.gov/survey_comp/hc_data_collection.jsp.

Dependent variables

For objective 1, we used data from the NHANES dental examination to estimate the prevalence of the following 3 dental conditions monitored by the Global Burden of Disease¹⁵: severe tooth loss (≤ 8 teeth), untreated caries (at least 1 affected tooth), severe periodontitis (attachment loss > 6 mm or pocket depth > 5 mm). Data for untreated caries and severe tooth loss were obtained from NHANES 2011–2016. Data for periodontitis were not included in NHANES 2015–2016, so we combined data from 2009–2014 for this variable. In addition, periodontitis data were collected only for adults older than 30 years.

For objective 2, we used data from MEPS 2014–2016 to estimate the percentage of adults with a past-year medical visit and no dental visit. We selected this period because most states choosing to expand Medicaid under the Patient Protection and Affordable Care Act did so on or after January 1, 2014 (that is, 32 states expanded Medicaid from January 2014 through December 2016).¹⁶ MEPS is the source Healthy People¹⁷ used to monitor oral health care use. We also used MEPS data for objective 3, estimating 2 measures of financial access to oral health care, that is, private dental insurance and higher household income ($\geq 200\%$ of the federal poverty threshold). MEPS collects information on both private and public medical insurance coverage, but only private coverage for dental insurance.

Independent variables

We used self-reported data from both surveys on presence of select CCs. CCs included fair or poor general health (versus good or better), arthritis, asthma, chronic bronchitis, diabetes, emphysema, heart disease (reported congestive heart failure, coronary heart disease, angina or angina pectoris, or heart attack), high blood pressure, and stroke history. Among adults with complete data for all CCs, we created 2 composite measures: having at least 1 CC and having 3 or more CCs, excluding fair or poor health. Case definitions for all CCs and their prevalence estimated from NHANES and MEPS data are provided in Table 1. We also included data for risk factors for dental disease; that is, obesity (body mass index ≥ 30 , as self-reported in MEPS and clinically assessed in NHANES) and smoking status. Smoking status in NHANES has 3 categories (current, past, never) and in MEPS has 2 categories (currently smoking, not currently smoking).

Statistical methods and data analysis

All analyses were conducted with SAS-Callable SUDAAN software, Version 11.0.3 (RTI International), which accounts for the complex multistage sampling frames of NHANES and MEPS. Survey sample weights were used to generate estimates.

For objective 1, we estimated the prevalence of dental conditions, standardized according to age (5-year increments) and sex to the 2000 US Census population among adults reporting and not reporting CCs. Standardized prevalence was compared according to CC status using a *t* ratio. A 5% level of statistical significance was used. We also used multivariable logistic regression models to examine whether the association between dental disease and the 3 composite measures of chronic disease (at least 1 CC, ≥ 3 CCs, fair or poor health) remained after controlling for covariates. All models included smoking and obesity and the following sociodemographic variables: sex, age (20–34, 35–49, 50–64, 65–74, or ≥ 75 years); race or ethnicity (non-Hispanic White, non-Hispanic Black, Mexican American, or other), educational attainment (<high school, high school, or >high school), and household income (<200% of the federal poverty threshold or $\geq 200\%$ of the federal poverty threshold). We obtained the predicted marginals, that is, prevalence,¹⁸ for each of the dental conditions among adults with and without each of the 3 measures of CCs from the logistic regression models. Model-adjusted prevalences were compared according to composite CC status using a *t* ratio. As SUDAAN does not report 95% CIs for this procedure, the authors generated these values by means of adding or subtracting the product of the standard error and 1.96 from the difference.

Preliminary adjusted analyses did not detect a significant association between severe periodontal disease and the composite measures of CC status. Because other studies have found an association between any periodontitis and CC status,^{4,13} we conducted sensitivity analyses to determine whether we could detect an association after changing the case definition of periodontitis to “any” (American Academy of Periodontology, Centers for Disease Control and Prevention¹⁹) and the CC variable to reporting cardiovascular disease, diabetes, emphysema, or stroke.

For objectives 2 and 3, we estimated age and sex-standardized past-year medical and no dental use and financial access. Standardized prevalence was compared according to CC status using a *t* ratio at a 5% level of statistical significance.

RESULTS

Study sample

In NHANES 2011–2016, there were 15,314 and 15,335 adults with data regarding untreated caries and severe tooth loss, respectively, and 13,836 and 13,857 adults, respectively, with data for these dependent variables and all independent variables. In NHANES 2009–2014, there were 11,753 adults with data for periodontitis (severe or any) and 10,657 with data for all independent variables. In MEPS 2014–2016, there were 70,110 with data for dental use and insurance.

Prevalence of reporting at least 1 CC was approximately 50% in both NHANES and MEPS, prevalence of reporting 3 or more CCs was 14% in NHANES and 17% in MEPS, and prevalence of reporting fair or poor health was 18% in NHANES and 21% in MEPS (Table 1).

Prevalence of dental disease and tooth loss

Age and Sex-Standardized Prevalence—Overall prevalence of severe tooth loss was 7.5%, overall prevalence of severe periodontal disease was 14.1%, and overall prevalence of untreated caries was 23.5% (Table 2). Among adults reporting at least 1 CC, 3 or more CCs, and fair or poor health, prevalences of severe tooth loss and untreated caries were notably higher than in those not reporting. Severe tooth loss prevalence for the 3 CC measures was 3.1 (95% CI, 2.0 to 4.3) percentage points (PPs) higher, 7.8 (95% CI, 6.1 to 9.6) PPs higher, and 8.7 (95% CI, 7.1 to 10.2) PPs higher, respectively, and for untreated caries was 6.5 (95% CI, 4.6 to 8.3) PPs higher, 20.3 (95% CI, 16.5 to 24.1) PPs higher, and 14.1 (95% CI, 11.5 to 16.6) PPs higher, respectively. Severe periodontitis prevalence overall was 14.1% and was associated with reporting 3 or more CCs and fair or poor health. Prevalence of any periodontitis was 21.7 (95% CI, 18.1 to 25.2) PPs higher among adults reporting cardiovascular disease, diabetes, emphysema, or stroke than adults not reporting these conditions (data not shown). Differences in prevalence for specific CCs are presented in eTable 1 (available online at the end of this article).

Model Adjusted Findings—After controlling for covariates, prevalences of severe tooth loss and untreated caries remained associated with reporting CCs (Table 3), but the magnitude of the association might not have been clinically significant. Among adults reporting at least 1 CC, severe tooth loss was 1.8 (95% CI, 0.4 to 3.1) PPs higher and untreated caries was 2.8 (95% CI, 1.1 to 4.5) PPs higher. Among adults reporting 3 or more CCs, prevalence of severe tooth loss was 3.2 (95% CI, 2.0 to 4.4) PPs higher and prevalence of untreated caries was 3.4 (95% CI, 0.7 to 6.1) PPs higher. Among adults reporting fair or poor health, prevalence of severe tooth loss was 4.0 (95% CI, 2.4 to 5.6) PPs higher. We did not detect a difference in the prevalence of severe periodontitis between adults reporting and not reporting the 3 CC indicators. The sensitivity analysis, however, indicated an association between having any periodontitis and having diabetes, cardiovascular disease, emphysema, or stroke history (5.6 PPs difference; 95% CI, 2.7 to 8.5; data not shown).

Past-year medical and no dental use

Overall, 38.4% of adults had a past-year medical visit and no dental visit (Figure). Adults with each of the CCs or who were either obese or a current smoker were more likely to have a past-year medical visit and no dental visit than adults not reporting these CCs or risk factors. The percentage of adults who had a medical visit and no dental visit was about 55% higher among adults reporting 3 or more CCs (55.0% versus 35.3%) or fair or poor health (52.8% versus 34.2%).

Financial access to oral health care

Overall age and sex-standardized prevalence of having no dental insurance was 54.9% (Table 4). Adults with CCs were more likely not to have private dental insurance than

those without (Table 4 and eTable 2; available online at the end of this article). Among adults reporting at least 1 CC, 56.2% lacked private dental insurance and, among these adults, 43.7%, 39.7%, and 16.6% had private medical, public medical, or no medical insurance, respectively. Among adults reporting fair or poor health, 69.9% lacked private dental insurance, and among these adults, 30.0%, 49.2%, and 20.8% had private medical, public medical, and no medical insurance, respectively. Findings for adults reporting 3 or more CCs were similar. CC status was also associated with lower household income; at least 60% higher among adults reporting 3 or more CCs (43.1 versus 26.6) and fair or poor health (47.2 versus 23.4).

DISCUSSION

Our analysis of nationally representative data indicates that CCs are associated with higher prevalence of untreated caries, severe periodontitis, and severe tooth loss, especially among adults reporting 3 or more CCs or fair or poor health, which could also reflect symptomatic or multiple conditions. After controlling for covariates, the associations between reporting CCs and dental conditions diminished substantially, suggesting that much of the association may have been due to covariates that primarily measured common risk factors and lack of access. These higher unmet treatment needs, coupled with our finding that approximately 50% of adults with CCs had a past-year medical visit and no dental visit, suggest there may be missed opportunities for integrating dental education and referrals during primary care visits.

Primary care providers could play an important role in helping their adult patients with CCs maintain their oral health by means of educating them about their higher risk of dental disease and the importance of preventive care administered at home or provided in a dental office. In addition, primary care providers could screen patients for common oral conditions and refer them for oral health care. In 2011, the Institute of Medicine² reported that health care professionals with proper training could assess risk and screen for common oral conditions; oral health curricula designed for medical providers—*Smiles for Life*, *Protecting Children's Teeth*, and *The Oral Cavity: Portal to Health and Disease*²⁰—are available online. Without reimbursement, however, primary care providers may be reluctant to provide these services.²¹ Additional research could be helpful in determining the cost-effectiveness of reimbursing primary care providers for integrating oral health services into primary care settings.

Better medical-dental integration, that is, offering whole-person care, including oral health care, and coordinating care across the health system, including referral guidelines, shared electronic health records, electronic tools for appointments and guidance, and having personnel assist patients with making appointments, could increase access to oral health care and improve health outcomes.^{14,22} The patient-centered medical home model, which is typically limited to different medical services, has been associated with effective chronic disease management, increased patient and provider satisfaction, cost savings, improved quality of care, and increased preventive care.²³ Integration of oral health care into the patient-centered medical home could possibly provide these same benefits.¹⁴

Medical-dental integration can be facilitated by means of having a common payer or medical and dental services offered in the same facility. Kaiser Permanente, for example, integrated dental information into its electronic medical record. Electronic health record integration allows providers to share patient information regarding medical histories, medications, and treatments to avoid medical errors, and making and tracking appointments with different providers is made easier.¹⁴

Better medical-dental integration could also reduce the number of adults who seek oral health care in a hospital emergency department, where they often receive only antibiotics or medication for pain and receive no assistance in making a dental appointment.¹⁴ In 2016, there were 2.4 million emergency department visits for dental conditions, of which 90.5% (2.2 million) were among adults, at an average cost of \$999 per visit.²⁴ Much of these costs were paid by Medicaid (36%) or out of pocket (34%).

We also, found, however, that financial barriers could limit the potential effectiveness of referrals to oral health care; at least 60% of adults with CCs lacked private dental insurance, and at least one-third of adults had low household incomes. Among adults with multiple CCs, more than 40% had low household incomes. Oral health care has the highest financial barriers to obtaining needed care relative to other health care services,²⁵ and adults are more likely to experience financial barriers to oral health care (12.8% for working age, 7.2% for retirement age) than youth (4.6%). This may be due to a limited dental safety net for adults; Medicaid covered comprehensive dental services in only 18 states and the District of Columbia in 2019,¹⁶ and traditional fee-for-service Medicare does not provide dental coverage.²⁶ One strategy that has been found to increase access to oral health care is to expand the dental safety net. An analysis of national and state data from 2000 through 2012 found that introducing dental benefits for low-income adults living in states in which Medicaid did not provide comprehensive dental benefits improved both oral health care use and oral health (that is, reduced prevalence of untreated caries).²⁷

Our study had some limitations. First, we used cross-sectional data, and the direction of the association could not be determined. Second, as all CCs were self-reported and did not include undiagnosed cases, there was likely some misclassification of people with undiagnosed conditions. This would result in lower estimated prevalence of CCs and perhaps some attenuation of the association between chronic disease and our indicators of dental disease. Third, for the NHANES analyses, we combined 3 2-year cycles of NHANES data (a common practice to obtain sufficient sample size^{28,29}) without controlling for time trends. Finally, MEPS does not collect data to determine whether adults have Medicaid insurance that covers dental services. The effect of not specifying whether adults had public dental insurance may have been mitigated because so few states offer comprehensive Medicaid dental services.

CONCLUSIONS

We found that adults with CCs have a higher prevalence of unmet dental treatment needs and tooth loss. Integrating oral health care into primary care visits could potentially increase access to oral health education and referrals among these adults, of whom approximately

50% have had a medical visit and no dental visit. Medical visits may be their only opportunity for oral health messaging and dental referrals. Lack of private dental insurance and low household income, however, could limit the potential effectiveness of primary care referrals to oral health care.^{1–3} Furthermore, our findings support the growing body of literature documenting the impact of a limited dental safety net on the oral health status of adults.^{28,29} In our study, we examined oral health care use and financial access among those with and without CCs, and we found that people with CCs who had a higher prevalence of untreated dental disease had less access to oral health care than their counterparts without CCs.

Appendix

eTable 1.

Prevalence* of 3 dental conditions according to chronic condition status in US adults older than 20 years: National Health and Nutrition Examination Survey, 2011–2016.

CONDITION	SEVERE TOOTH LOSS, % (95% CI)	SEVERE PERIODONTITIS, †% (95% CI)	UNTREATED CARIES	
			% (95% CI)	Mean No. (95% CI)‡
Arthritis	9.2 (8.1 to 10.3)	11.7 (10.6 to 13.0)	29.5 (25.7 to 33.7)	3.2 (3.0 to 3.5)
No Arthritis	6.8 (6.0 to 7.8)	14.9 (13.6 to 16.5)	22.9 (21.1 to 24.9)	3.0 (2.8 to 3.1)
Difference	2.3 (1.2 to 3.4) [§]	–3.2 (–4.5 to –2.0) [§]	6.6 (3.3 to 9.9) [§]	0.2 (–0.0 to 0.6)
Asthma	12.0 (9.0 to 14.9)	11.9 (9.7 to 14.5)	27.0 (23.8 to 30.4)	3.1 (2.7 to 3.5)
No Asthma	7.1 (6.3 to 8.0)	14.3 (13.1 to 15.6)	23.0 (21.1 to 25.0)	2.9 (2.8 to 3.1)
Difference	4.9 (2.5 to 7.3) [§]	–2.4 (–4.7 to –0.1) [§]	4.0 (1.1 to 6.9) [§]	0.1 (–0.2 to 0.5)
Chronic Bronchitis	15.6 (13.1 to 18.6)	13.5 (10.3 to 17.4)	37.4 (32.4 to 42.7)	3.2 (2.8 to 3.6)
No Chronic Bronchitis	7.0 (6.2 to 7.9)	14.2 (13.0 to 15.4)	22.9 (21.0 to 24.8)	2.9 (2.8 to 3.1)
Difference	8.7 (6.2 to 11.1) [§]	–0.7 (–3.9 to 2.6)	14.5 (9.8 to 19.9) [§]	0.3 (–0.2 to 0.7)
Diabetes	10.6 (9.1 to 12.4)	18.1 (15.4 to 21.1)	32.0 (27.9 to 36.4)	3.0 (2.6 to 3.3)
No Diabetes	7.0 (6.1 to 7.9)	13.9 (12.6 to 15.2)	23.0 (21.1 to 25.0)	3.0 (2.8 to 3.1)
Difference	3.7 (2.0 to 5.3) [§]	4.2 (1.3 to 7.1) [§]	9.0 (4.8 to 13.1) [§]	0 (–0.3 to 0.4)
Emphysema	33.2 (26.2 to 41.1)	29.0 (24.2 to 34.3)	43.1 (35.9 to 50.6)	3.2 (2.7 to 3.8)
No Emphysema	7.1 (6.3 to 7.9)	14.1 (12.9 to 15.4)	23.3 (21.5 to 25.3)	3.0 (2.8 to 3.1)
Difference	26.2 (18.9 to 33.5) [§]	14.9 (9.7 to 20.1) [§]	19.7 (12.7 to 26.8) [§]	0.2 (–0.3 to 0.8)
Cardiovascular Disease	16.5 (13.8 to 19.5)	17.4 (13.4 to 22.2)	42.9 (38.2 to 47.7)	3.4 (2.8 to 4.1)

CONDITION	SEVERE TOOTH LOSS, % (95% CI)	SEVERE PERIODONTITIS, †% (95% CI)	UNTREATED CARIES	
			% (95% CI)	Mean No. ‡ (95% CI) ‡
No Cardiovascular Disease	6.9 (6.0 to 7.9)	14.0 (12.8 to 15.3)	22.8 (21.1 to 24.7)	2.9 (2.8 to 3.0)
Difference	9.6 (6.8 to 12.3) §	3.4 (−1.0 to 7.7)	20.0 (15.5 to 24.6) §	0.5 (−0.2 to 1.3)
High Blood Pressure	8.7 (7.6 to 9.9)	15.1 (13.8 to 16.6)	29.1 (26.2 to 32.1)	3.0 (2.8 to 3.3)
No High Blood Pressure	6.5 (5.6 to 7.6)	13.6 (12.2 to 15.2)	22.0 (20.2 to 23.9)	2.9 (2.8 to 3.1)
Difference	2.2 (1.3 to 3.0) §	1.5 (−0.0 to 3.0)	7.1 (4.7 to 9.4) §	0.1 (−0.2 to 0.3)
Stroke	20.4 (16.8 to 24.6)	26.3 (19.3 to 34.7)	39.9 (32.5 to 47.8)	2.8 (2.5 to 3.1)
No Stroke	7.1 (6.2 to 8.0)	14.1 (13.0 to 15.4)	23.3 (21.5 to 25.2)	3.0 (2.8 to 3.1)
Difference	13.3 (9.3 to 17.3) §	12.1 (4.3 to 20.0) §	16.6 (9.0 to 24.2) §	−0.2 (−0.4 to 0.2)
Obesity	8.1 (7.3 to 9.1)	14.1 (12.8 to 15.5)	26.8 (24.8 to 29.0)	2.8 (2.6 to 3.0)
No Obesity	7.1 (6.1 to 8.3)	14.1 (12.7 to 15.6)	21.3 (19.3 to 23.4)	3.0 (2.9 to 3.2)
Difference	1.0 (0.1 to 1.9) §	0.1 (−1.4 to 1.6)	5.5 (3.4 to 7.6) §	−0.2 (−0.4 to 0)
Current Smoker	17.9 (15.7 to 20.3)	22.3 (20.1 to 24.6)	37.5 (34.6 to 40.5)	3.6 (3.3 to 3.8)
Not Current Smoker	5.6 (5.0 to 6.2)	11.9 (10.7 to 13.1)	19.8 (18.0 to 21.6)	2.7 (2.5 to 2.8)
Difference	12.3 (10.2 to 14.4) §	10.4 (8.4 to 12.5) §	17.7 (15.0 to 20.4) §	0.9 (0.6 to 1.2)

* Standardized by age and sex to 2000 US population.

† Data collected in 2009–2014 among adults older than 30 years.

‡ Mean number of untreated caries was limited to persons with at least 1 untreated cavity.

§ The value among adults with condition is significantly different from that among those adults without condition (at $P < .05$).

eTable 2.

Prevalence of no private dental insurance and low household income* according to chronic condition status in US adults: Medical Expenditure Panel Survey, 2014–2016.

CONDITION	AMONG ADULTS WITH NO DENTAL INSURANCE WITH, % (95% CI)				
	NO PRIVATE DENTAL INSURANCE, % (95% CI)	Private Medical	Public Medical	No Medical	LOW HOUSEHOLD INCOME, % (95% CI)
Arthritis	60.0 (57.6 to 62.3)	40.5 (37.8 to 43.2)	46.3 (43.2 to 49.5)	13.2 (11.2 to 15.5)	38.2 (35.9 to 40.5)
No Arthritis	53.9 (52.7 to 55.2)	48.1 (46.4 to 49.8)	29.0 (27.5 to 30.5)	22.9 (21.7 to 24.2)	26.9 (25.7 to 28.1)

AMONG ADULTS WITH NO DENTAL INSURANCE WITH, % (95% CI)					
CONDITION	NO PRIVATE DENTAL INSURANCE, % (95% CI)	Private Medical	Public Medical	No Medical	LOW HOUSEHOLD INCOME, % (95% CI)
Difference	6.1 (3.9 to 8.2) [†]	-7.6 (-10.1 to -5.2) [†]	17.4 (14.6 to 20.2) [†]	-9.7 (-12.0 to -7.5) [†]	11.3 (9.2 to 13.4) [†]
Asthma	56.6 (54.5 to 58.7)	41.7 (38.8 to 44.6)	44.5 (41.4 to 47.7)	13.8 (12.1 to 15.8)	33.9 (31.7 to 36.3)
No Asthma	54.7 (53.4 to 55.9)	46.8 (45.1 to 48.4)	31.3 (29.8 to 32.9)	21.9 (20.7 to 23.2)	28.2 (27.1 to 29.3)
Difference	2.0 (-0.1 to 4.0)	-5.1 (-7.9 to -2.3) [†]	13.2 (10.6 to 15.9) [†]	-8.1 (-10.2 to -6.1) [†]	5.7 (3.7 to 7.8) [†]
Chronic Bronchitis	70.0 (64.9 to 74.6)	27.0 (22.8 to 31.6)	56.9 (51.1 to 62.5)	16.2 (11.9 to 21.5)	51.3 (45.9 to 56.6)
No Chronic Bronchitis	54.4 (53.1 to 55.6)	47.1 (45.4 to 48.7)	31.7 (30.2 to 33.3)	21.2 (20.0 to 22.4)	27.8 (26.7 to 28.9)
Difference	15.6 (10.8 to 20.4) [†]	-20.1 (-24.7 to -15.6) [†]	25.2 (19.8 to 30.6) [†]	-5.1 (-9.9 to -0.3) [†]	23.5 (18.3 to 28.7) [†]
Diabetes	62.1 (59.0 to 65.1)	35.1 (31.4 to 39.1)	48.7 (44.9 to 52.5)	16.2 (13.1 to 19.7)	42.5 (38.9 to 46.1)
No Diabetes	54.4 (53.1 to 55.6)	47.4 (45.8 to 49.0)	31.1 (29.6 to 32.8)	21.4 (20.3 to 22.6)	27.6 (26.5 to 28.7)
Difference	7.7 (4.7 to 10.8) [†]	-12.3 (-16.1 to -8.5) [†]	17.6 (13.8 to 21.3) [†]	-5.3 (-8.7 to -1.8) [†]	14.9 (11.2 to 18.5) [†]
Emphysema	81.2 (75.1 to 86.1)	18.5 (15.3 to 22.2)	66.3 (60.3 to 71.9)	15.1 (11.1 to 20.3)	60.2 (56.1 to 64.3)
No Emphysema	54.6 (53.4 to 55.8)	46.7 (45.0 to 48.3)	32.1 (30.5 to 33.7)	21.3 (20.1 to 22.5)	28.3 (27.2 to 29.5)
Difference	26.7 (21.2 to 32.1) [†]	-28.1 (-32.0 to -24.3) [†]	34.3 (28.3 to 40.3) [†]	-6.1 (-10.8 to -1.4) [†]	31.9 (27.7 to 36.2) [†]
Cardiovascular Disease	57.0 (54.2 to 59.7)	41.2 (37.8 to 44.7)	43.5 (40.3 to 46.8)	15.3 (13.2 to 17.7)	33.8 (31.5 to 36.3)
No Cardiovascular Disease	54.4 (53.2 to 55.6)	46.8 (45.2 to 48.4)	31.4 (29.9 to 33.0)	21.8 (20.6 to 23.0)	27.9 (26.7 to 29.1)
Difference	2.6 (0.1 to 5.1) [†]	-5.6 (-8.6 to -2.5) [†]	12.0 (9.3 to 14.8) [†]	-6.5 (-8.8 to -4.2) [†]	5.9 (3.8 to 8.1) [†]
High Blood Pressure	59.3 (57.6 to 60.9)	40.5 (38.4 to 42.7)	42.0 (39.9 to 44.1)	17.5 (16.0 to 19.0)	35.6 (34.0 to 37.3)
No High Blood Pressure	53.6 (52.2 to 54.9)	48.4 (46.7 to 50.1)	29.2 (27.7 to 30.8)	22.4 (21.2 to 23.7)	26.4 (25.2 to 27.5)
Difference	5.7 (4.0 to 7.4) [†]	-7.8 (-9.9 to -5.8) [†]	12.8 (11.1 to 14.4) [†]	-4.9 (-6.4 to -3.5) [†]	9.3 (7.8 to 10.7) [†]
Stroke	71.9 (66.8 to 76.4)	29.0 (25.2 to 33.1)	57.2 (52.5 to 61.8)	13.8 (10.6 to 17.9)	51.1 (46.0 to 56.1)
No Stroke	54.5 (53.3 to 55.8)	46.8 (45.2 to 48.4)	31.9 (30.3 to 33.5)	21.3 (20.2 to 22.5)	28.2 (27.0 to 29.3)
Difference	17.3 (12.7 to 21.9) [†]	-5.4 (-7.2 to -3.7) [†]	25.3 (20.3 to 30.1) [†]	-7.5 (-11.4 to -3.6) [†]	22.9 (17.8 to 28.0) [†]
Obesity	56.8 (55.4 to 58.3)	42.5 (40.5 to 44.4)	36.9 (34.8 to 39.0)	20.7 (19.1 to 22.4)	31.8 (30.3 to 33.3)
No Obesity	54.1 (52.8 to 55.5)	47.9 (46.2 to 49.6)	30.7 (29.1 to 32.3)	21.4 (20.3 to 22.6)	27.4 (26.3 to 28.5)

AMONG ADULTS WITH NO DENTAL INSURANCE WITH, % (95% CI)					
CONDITION	NO PRIVATE DENTAL INSURANCE, % (95% CI)	Private Medical	Public Medical	No Medical	LOW HOUSEHOLD INCOME, % (95% CI)
Difference	2.7 (1.3 to 4.1) [†]	-17.8 (-22.0 to -13.6)	6.2 (4.6 to 7.8) [†]	-0.8 (-2.1 to 0.6)	4.4 (3.2 to 5.6) [†]
Current Smoker	68.2 (66.2 to 70.1)	31.5 (29.5 to 33.5)	46.5 (44.0 to 49.0)	22.0 (20.5 to 23.7)	45.6 (43.5 to 47.8)
Not Current Smoker	52.0 (50.8 to 53.2)	50.3 (48.4 to 52.1)	29.3 (27.8 to 30.9)	20.4 (19.0 to 21.8)	25.4 (24.3 to 26.6)
Difference	16.2 (14.2 to 18.2) [†]	-18.8 (-21.1 to -16.6) [†]	17.2 (14.9 to 19.4) [†]	1.7 (-0.2 to 3.5)	20.2 (18.2 to 22.2) [†]

* Low-income household (< 200% of federal poverty threshold). Standardized by age and sex to 2000 US population.

[†] The value among adults with condition is significantly different from that among those adults without condition. (at $P < .05$).

ABBREVIATION KEY

CC	Chronic condition
MEPS	Medical Expenditure Panel Survey
NHANES	National Health and Nutrition Examination Survey

References

1. US Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
2. Institute of Medicine. Advancing Oral Health in America. National Academies Press; 2011.
3. Institute of Medicine. Improving Access to Oral Health Care for Vulnerable and Underserved Populations. National Academies Press; 2011.
4. Griffin SO, Barker LK, Griffin PM, Cleveland JL, Kohn W. Oral health needs among U.S. adults and persons with CCs. JADA. 2009;140(10):1266–1274. [PubMed: 19797557]
5. Parker ML, Thornton-Evans G, Wei L, Griffin SO. Prevalence of and changes in tooth loss among adults aged ≥50 years with selected CCs—United States, 1999–2004 and 2011–2016. MMWR Morb Mortal Wkly Rep. 2020; 69(21):1141–1145.
6. Patel N, Fils-Aime R, Li CH, Lin M, Robison V. Prevalence of past-year dental visit among us adults aged 50 years or older, with selected chronic diseases, 2018. Prev Chronic Dis. 2021;18:200576.
7. Messadi DV, Macek MD, Markovic D, Atchison KA. Oral health literacy, preventive behavior measures, and chronic medical conditions. JDR Clin Trans Res. 2018; 3(3):288–301. [PubMed: 30938606]
8. Hostetter M, Klein S. In Focus: Integrating Oral Health into Primary Care. 2015. The Commonwealth Fund. Accessed March 17, 2021. <https://www.commonwealthfund.org/publications/newsletter-article/2015/feb/focus-integrating-oral-health-primary-care>
9. Oral Health. World Health Organization. Published March 25, 2020. Accessed August 18, 2020. <https://www.who.int/news-room/fact-sheets/detail/oral-health>
10. Griffin SO, Regnier E, Griffin PM, Huntley VN. Effectiveness of fluoride in preventing caries in adults. J Dent Res. 2007;86(5):410–414. [PubMed: 17452559]

11. Shay K Infectious complications of dental and periodontal diseases in the elderly population. *Clin Infect Dis.* 2002;34(9):1215–1223. [PubMed: 11941548]
12. Simpson TC, Weldon JC, Worthington HV, et al. Treatment of periodontal disease for glycemic control in people with diabetes mellitus. *Cochrane Database Syst Rev.* 2015;11:CD004714.
13. Jeffcoat MK, Jeffcoat RL, Gladowski PA, Bramson JB, Blum JJ. Impact of periodontal therapy on general health evidence from insurance data for five systemic conditions. *Am J Prev Med.* 2014;47(2):166–174. [PubMed: 24953519]
14. Atchison KA, Rozier RG, Weintraub JA. 2018. Integration of oral health and primary care: communication, coordination, and referral. *NAM.edu/Perspectives*. Accessed March 17, 2021. <https://nam.edu/wp-content/uploads/2018/10/Integration-of-Oral-Health-and-Primary-Care.pdf>
15. Marcenes W, Kassebaum NJ, Bernabé E, et al. Global burden of oral conditions in 1990–2010: a systematic analysis. *J Dent Res.* 2013;92(7):592–597. [PubMed: 23720570]
16. Medicaid adult dental benefits coverage by state. Center for Health Care Strategies. Updated September 2019. Accessed October 27, 2020. https://www.chcs.org/media/Medicaid-Adult-Dental-Benefits-Overview-Appendix_091519.pdf
17. Healthy People 2020. Accessed March 17, 2021. https://www.healthypeople.gov/node/5028/data_details
18. Bieler GS, Brown GG, Williams RL, Brogan DJ. Estimating model-adjusted risks, risk differences, and risk ratios from complex survey data. *Am J Epidemiol.* 2010; 171(5):618–623. [PubMed: 20133516]
19. Eke PI, Page RC, Wei L, Thornton-Evans G, Genco RJ. Update of the case definitions for population-based surveillance of periodontitis. *J Periodont.* 2012; 83(12):1449–1454. [PubMed: 22420873]
20. Douglass AB, Maier R, Deutchman M, et al. *Smiles for Life: A National Oral Health Curriculum*. 3rd ed.) Society of Teachers of Family Medicine; 2010. Accessed October 18, 2019. www.smilesforlifeoralehealth.com
21. Gross CP, Andersen MS, Krumholz HM, McAvay GJ, Proctor D, Tinetti ME. Relation between Medicare screening reimbursement and stage at diagnosis for older patients with colon cancer. *JAMA.* 2006;296: 2815–2822. [PubMed: 17179458]
22. Atchison KA, Rozier RG, Weintraub JA. Integration of oral health and primary care: communication, coordination, and referral. October 8, 2018. *National Academy of Medicine.* 10.31478/201810e
23. Patient-centered medical home (PCMH) model. Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention. Accessed November 14, 2021. https://www.cdc.gov/dhds/policy_resources/pcmh.htm
24. Kelekar U, Naavaal S. Dental visits and associated emergency department-charges in the US, Nationwide Emergency Department Sample, 2014. *JADA.* 2019; 150(4):305–312. [PubMed: 30922460]
25. Vujicic M, Buchmueller T, Klein R. Dental care presents the highest level of financial barriers, compared to other types of health care services. *Health Aff (Millwood).* 2016;35(12):2176–2182. 10.1377/hlthaff.2016.0800 [PubMed: 27920304]
26. Dental Services. Medicare. Accessed March 10, 2021. [https://www.medicare.gov/coverage/dental-services#:~:text=Medicare%20doesn't%20cover%20most,plates%2C%20or%20other%20dental%20devices.&text=Some%20Medicare%20Advantage%20Plans%20\(Part,vision%2C%20hearing%2C%20or%20dental](https://www.medicare.gov/coverage/dental-services#:~:text=Medicare%20doesn't%20cover%20most,plates%2C%20or%20other%20dental%20devices.&text=Some%20Medicare%20Advantage%20Plans%20(Part,vision%2C%20hearing%2C%20or%20dental)
27. Decker SL, Lipton BJ. Do Medicaid benefit expansions have teeth? The effect of Medicaid adult dental coverage on the use of dental services and oral health. *J Health Econ.* 2015;44:212–225. [PubMed: 26519908]
28. Griffin SO, Griffin PM, Li C-H, Bailey WD, Brunson D, Jones JA. Changes in older adults' oral health and disparities: 1999–2004 and 2011–2016. *J Am Geriatr Soc.* 2019;67(6):1152–1157. [PubMed: 30698819]
29. Williams S, Wei L, Griffin SO, Thornton-Evans G. Untreated caries among US working-aged adults and association with reporting need for oral health care. *JADA.* 2021;152(1):55–64. [PubMed: 33413851]

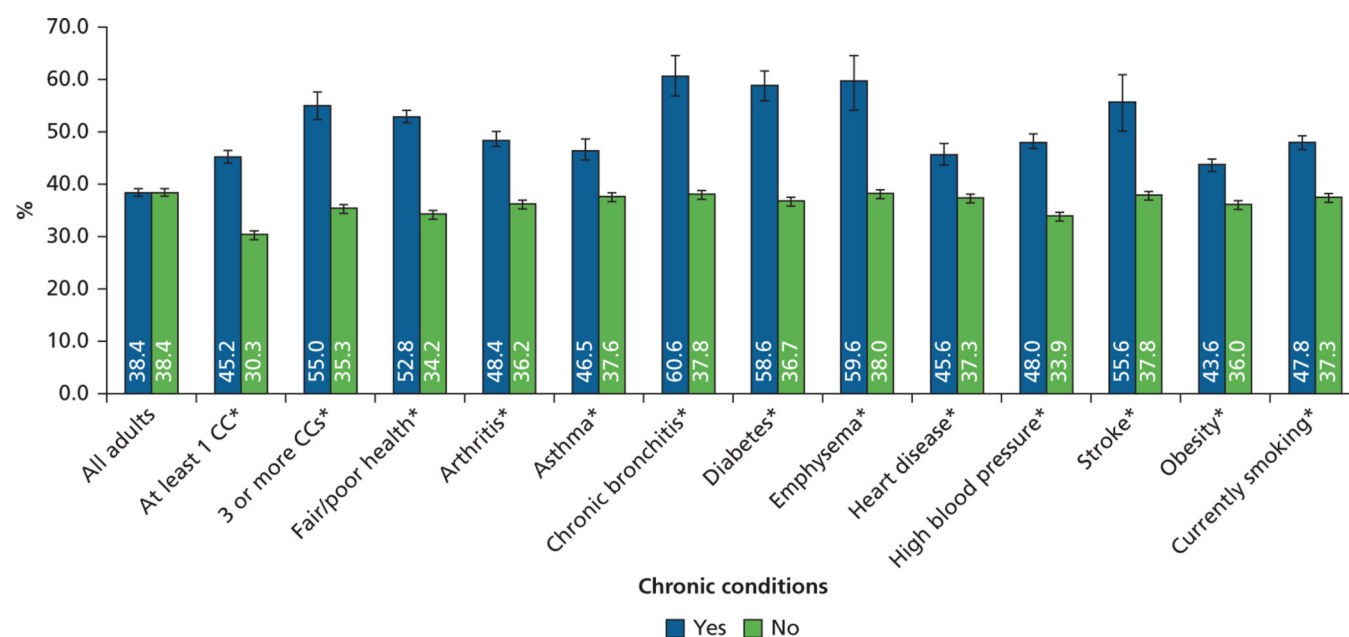


Figure.

Prevalence of past-year medical visit and no dental visit according to chronic condition status in US adults older than 20 years, Medical Expenditure Panel Survey, 2014–2016. *Percentage of adults with past-year medical visit but no dental visit was significantly higher at $P < .05$ on the basis of t test among adults with chronic conditions compared with those adults without.

Table 1.

Case definitions and prevalence of CCs* in US adults older than 20 years: National Health and Nutrition Examination Survey 2011–2016 and Medical Expenditure Panel Survey 2014–2016.

CONDITION	NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY		MEDICAL EXPENDITURE PANEL SURVEY	
	Case Definition	Prevalence, % (95% CI)	Case Definition	Prevalence, % (95% CI)
At Least 1 CC	Reported at least 1 CC, including arthritis, asthma, chronic bronchitis, diabetes, emphysema, heart disease, high blood pressure, and stroke	49.5 (48.2 to 50.8)	Have at least 1 CC, including arthritis, asthma, chronic bronchitis, diabetes, emphysema, heart disease, high blood pressure, and stroke	50.9 (50.1 to 51.8)
≥ 3 CCs	Have 3 or more CCs, including arthritis, asthma, chronic bronchitis, diabetes, emphysema, heart disease, high blood pressure, and stroke	13.8 (13.0 to 14.7)	Have 3 or more CCs, including arthritis, asthma, chronic bronchitis, diabetes, emphysema, heart disease, high blood pressure, and stroke	16.8 (16.2 to 17.4)
Fair or Poor Health	Fair or poor health: reported general health status to be fair or poor versus good, very good, or excellent	17.8 (16.5 to 19.1)	Perceived health status in round 3/1, 4/2, and 5/3: reported to be fair or poor versus good, very good, or excellent in any round	21.4 (20.7 to 22.1)
Diabetes, Cardiovascular Disease, Emphysema, or Stroke	Reported diabetes, cardiovascular disease, emphysema, or stroke	15.5 (14.6 to 16.4)	Reported diabetes, cardiovascular disease, emphysema, or stroke	21.8 (21.2 to 22.5)
Arthritis	Answered “yes” to ever being told by health care professional that you have arthritis	23.4 (22.5 to 24.3)	Answered “yes” to ever received a diagnosis of arthritis	25.0 (24.4 to 25.7)
Asthma	Answered “yes” to ever being told by health care professional that you have asthma	8.8 (8.2 to 9.5)	Answered “yes” to ever received a diagnosis of asthma	9.4 (9.0 to 9.9)
Chronic Bronchitis	Answered “yes” to ever being told by a physician or health care professional that you have chronic bronchitis	5.6 (5.0 to 6.2)	Answered “yes” to has had chronic bronchitis in the past 12 months	2.9 (2.7 to 3.2)
Diabetes	Answered “yes” to ever being told by a physician or health care professional that you have diabetes	9.3 (8.7 to 9.9)	Answered “yes” to ever received a diagnosis of diabetes	9.2 (8.8 to 9.5)
Emphysema	Answered “yes” to ever being told by a physician or health care professional that you have emphysema	1.6 (1.4 to 2.0)	Answered “yes” to ever received a diagnosis of emphysema	1.9 (1.7 to 2.1)
Cardiovascular Disease	Answered “yes” to ever being told attack by a physician or health care professional that you have congestive heart failure, coronary heart disease, angina or angina pectoris, or heart attack	6.2 (5.8 to 6.7)	Answered “yes” to ever received a diagnosis of coronary heart disease, angina, heart attack, or other heart disease	13.9 (13.4 to 14.4)
High Blood Pressure	Answered “yes” to ever being told by a physician or health care professional that you have high blood pressure	31.1 (30.0 to 32.2)	Answered “yes” to ever received a diagnosis of high blood pressure	31.8 (31.1 to 32.5)
Stroke	Stroke: answered “yes” to ever being told you had a stroke by health care professional	2.5 (2.3 to 2.8)	Answered “yes” to ever received a diagnosis of having had a stroke or transient ischemic attack (transient ischemic attack or ministroke)	3.6 (3.4 to 3.8)
Obesity	Body mass index 30 or higher (based on examination height and weight)	37.6 (36.0 to 39.1)	Body mass index score in round 5/3 (based on reported height and weight) 30 or higher	30.9 (30.1 to 31.8)

CONDITION	NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY		MEDICAL EXPENTITURE PANEL SURVEY	
	Case Definition	Prevalence, % (95% CI)	Case Definition	Prevalence, % (95% CI)
Current Smoker	Answered “yes” to smoked at least 100 cigarettes in life and “yes” to do you now smoke cigarettes	19.7 (18.4 to 21.0)	Answered “yes” to currently smoke	15.3 (14.5 to 16.1)

* At least 1 chronic condition (CC) includes arthritis, asthma, chronic bronchitis, diabetes, emphysema, cardiovascular disease, high blood pressure, and stroke.

Table 2.

Prevalence* of 3 dental conditions according to CC[†] status in US adults older than 20 years: National Health and Nutrition Examination Survey, 2011–2016.

VARIABLE	SEVERE TOOTH LOSS, % (95% CI)	SEVERE PERIODONTITIS, [‡] % (95% CI)	UNTREATED CARIES	
			% (95% CI)	Mean, No. (95% CI) [§]
All Adults	7.5 (6.6 to 8.5)	14.1 (13.0 to 15.4)	23.5 (21.7 to 25.4)	3.0 (2.8 to 3.1)
At Least 1 CC	8.6 (7.7 to 9.6)	13.9 (12.7 to 15.2)	27.3 (24.9 to 29.8)	3.1 (2.9 to 3.3)
Does Not Have at Least 1 CC	5.5 (4.3 to 6.9)	15.4 (13.4 to 17.6)	20.8 (19.1 to 22.6)	2.9 (2.7 to 3.1)
Difference	3.1 (2.0 to 4.3) [#]	−1.5 (−3.5 to 0.6)	6.5 (4.6 to 8.3) [#]	0.2 (−0.1 to 0.4)
<i>P</i> value for the difference	<.0001	.1613	<.0001	.2493
Have ≥ 3 CCs	13.9 (12.3 to 15.7)	17.7 (15.5 to 20.2)	42.6 (38.3 to 47.0)	3.7 (3.2 to 4.1)
Does Not Have ≥ 3 CCs	6.1 (5.2 to 7.1)	13.9 (12.6 to 15.4)	22.3 (20.5 to 24.2)	2.9 (2.8 to 3.1)
Difference	7.8 (6.1 to 9.6) [#]	3.8 (1.2 to 6.4) [#]	20.3 (16.5 to 24.1) [#]	0.8 (0.2 to 1.3) [#]
<i>P</i> value for the difference	<.0001	.0049	<.0001	.0045
Fair or Poor Health	14.3 (12.6 to 16.3)	20.1 (18.1 to 22.2)	35.3 (32.8 to 37.9)	3.3 (3.1 to 3.5)
Good, Very Good, or Excellent	5.7 (5.0 to 6.4)	12.8 (11.6 to 14.2)	21.2 (19.4 to 23.1)	2.9 (2.7 to 3.0)
Difference	8.7 (7.1 to 10.2) [#]	7.2 (5.1 to 9.4) [#]	14.1 (11.5 to 16.6) [#]	0.4 (0.3 to 0.6) [#]
<i>P</i> value for the difference	<.0001	<.0001	<.0001	<.0001

* Standardized according to age and sex to 2000 US population.

[†]CC: Chronic condition.

[‡]Data collected in 2009–2014 among adults older than 30 years.

[§]Mean number of untreated caries was limited to people with at least 1 untreated cavity.

[#]Significantly different ($P < .05$, *t* test).

Table 3.

Model-predicated prevalence of 3 dental conditions according to health status and CC* in US adults older than 20 years: National Health and Nutrition Examination Survey, 2011–2016.

VARIABLE	SEVERE TOOTH LOSS, % (95% CI)	SEVERE PERIODONTITIS, [†] % (95% CI)	UNTREATED CARIES, % (95% CI)
Model 1: At Least 1 CC			
Yes	8.5 (7.5 to 9.7)	14.0 (12.7 to 15.4)	24.0 (21.9 to 26.3)
No	6.7 (5.1 to 8.8)	15.1 (13.3 to 17.1)	21.2 (19.4 to 23.1)
Difference	1.8 (0.4 to 3.1) [‡]	−1.1 (−2.9 to 0.7)	2.8 (1.1 to 4.5) [‡]
P value for the difference	.0098	.2415	.0015
Model 2: ≥ 3 CCs			
Yes	10.3 (8.9 to 11.9)	13.6 (12.0 to 15.3)	25.5 (22.6 to 28.6)
No	7.1 (6.0 to 8.4)	14.7 (13.3 to 16.2)	22.1 (20.3 to 24.1)
Difference	3.2 (2.0 to 4.4) [‡]	−1.1 (2.8 to 0.6)	3.4 (0.7 to 6.1) [‡]
P value for the difference	<.0001	.2031	.0171
Model 3: Fair or Poor Health			
Yes	11.0 (9.1 to 13.2)	15.0 (13.2 to 17.1)	24.3 (21.9 to 26.9)
No	7.0 (6.1 to 8.1)	14.3 (12.9 to 15.7)	22.2 (20.3 to 24.2)
Difference	4.0 (2.4 to 5.6) [‡]	0.7 (−1.2 to 2.6)	2.1 (−0.2 to 4.4)
P value for the difference	<.0001	.4510	0.0679

* CC: Chronic condition.

[†] Severe periodontitis data are from National Health and Nutrition Examination Survey 2009–2014 because data were not available from National Health and Nutrition Examination Survey 2011–2016.

[‡] Predicted prevalence is significantly different at $P < .05$ on the basis of Wald F test among adults with condition compared with those adults without condition.

Table 4.

Prevalence of no private dental insurance, medical insurance coverage among these adults, and low household income * according to CC [†] status in US adults: Medical Expenditure Panel Survey, 2014–2016. [‡]

CONDITION	NO PRIVATE DENTAL INSURANCE	AMONG ADULTS WITH NO DENTAL INSURANCE WITH			LOW HOUSEHOLD INCOME
		Private Medical	Public Medical	No Medical	
All Adults	54.9 (53.7 to 56.1)	46.2 (44.6 to 47.8)	32.6 (31.1 to 34.3)	21.2 (20.0 to 22.4)	28.8 (27.6 to 29.9)
At Least 1 CC	56.2 (54.6 to 57.7)	43.7 (41.8 to 45.6)	39.7 (37.7 to 41.8)	16.6 (15.4 to 18.0)	32.5 (31.1 to 33.9)
Does Not Have at Least 1 CC	53.4 (52.0 to 54.9)	49.4 (47.5 to 51.3)	25.6 (24.1 to 27.2)	25.0 (23.6 to 26.4)	25.3 (24.1 to 26.6)
Difference	2.8 (1.1 to 4.5) [§]	-5.7 (-7.6 to -3.8) [§]	14.1 (12.3 to 15.8) [§]	-8.3 (-9.9 to -6.8) [§]	7.2 (5.9 to 8.5) [§]
<i>P</i> value for the difference	.0017	<.0001	<.0001	<.0001	<.0001
Have ≥3 CCs	64.1 (61.4 to 66.7)	32.8 (29.8 to 35.8)	52.5 (49.4 to 55.7)	14.7 (12.6 to 17.1)	43.1 (40.4 to 45.9)
Does Not Have ≥3 CCs	53.7 (52.4 to 54.9)	48.5 (46.9 to 50.1)	29.6 (28.1 to 31.1)	21.9 (20.7 to 23.1)	26.6 (25.5 to 27.7)
Difference	10.4 (7.8 to 12.9) [§]	-15.8 (-18.6 to -3.0) [§]	23.0 (20.0 to 25.9) [§]	-7.2 (-9.5 to -4.9) [§]	16.5 (13.9 to 19.1) [§]
<i>P</i> value for the difference	<.0001	<.0001	<.0001	<.0001	<.0001
Fair or Poor Health	69.9 (68.2 to 71.5)	30.0 (28.2 to 31.9)	49.2 (46.9 to 51.5)	20.8 (19.1 to 22.6)	47.2 (45.5 to 48.9)
Good, Very Good, or Excellent	51.0 (49.7 to 52.2)	52.6 (51.0 to 54.2)	26.2 (24.8 to 27.6)	21.2 (20.0 to 22.5)	23.4 (22.4 to 24.4)
Difference	18.9 (17.3 to 20.5) [§]	-22.6 (-24.2 to -20.9) [§]	23.0 (21.3 to 24.7) [§]	-0.4 (-2.1 to 1.2)	23.8 (22.5 to 25.2) [§]
<i>P</i> value for the difference	<.0001	<.0001	<.0001	.6092	<.0001

* Low-income household below 200% of federal poverty threshold. Standardized according to age and sex of 2000 US population.

[†]CC: Chronic condition.

[‡]Values are % (95% CI) except where otherwise indicated.

[§]Difference in percentage is statistically significant at $P < .05$, on the basis of *t* tests.