

Dental Insurance Visits and Expenditures Among Older Adults

Richard J. Manski, DDS, PhD, MBA, Harold S. Goodman, DMD, MPH, Britt C. Reid, DDS, PhD, and Mark D. Macek, DDS, DrPh

As they age, adults are retaining a higher mean number of teeth, potentially increasing their dental needs at a time when they may also be experiencing a diminished capacity to access care because of retirement and its attendant loss of income and dental coverage. The oldest age groups are the fastest growing segments of the US adult population. Although the total US population is expected to increase by 42% over the next half century, the number of men and women aged 65 years and older will increase by 126%, those aged 85 and older will increase by 316%, and centenarians will increase by 956%; nearly 10 times the present number.¹ According to the US Administration on Aging, persons aged 65 years or older totaled 35 million in the year 2000, representing 12.4% of the US population.²

At the same time, a growing proportion of US adults are retaining an increasing number of their teeth throughout their life span.³ A relative increase in coronal and root caries, periodontal diseases, inadequate or absent prostheses, and preventive needs may result from a greater number of retained teeth among elderly persons.⁴ Additionally, because oral and pharyngeal cancers are diagnosed primarily among older Americans, as the population ages, the number of persons benefiting from early diagnosis will also increase.⁵

Paradoxically, as the number of people with dental care needs increases, for many aging Americans, the ability to finance this care may actually be decreasing as a result of retirement. Retirement is generally accompanied by a decrease in income and the loss of employer-sponsored dental coverage.^{6,7} Although Medicare is usually available to retirees to cover many, if not most, health care needs, dental care is rarely covered. The purpose of this article is to examine the confluence of an aging population, decreased income, and a decreased availability of dental care coverage using data from the 1996 Medical Expenditure Panel Survey (MEPS).⁸

Objectives. We examined the effect of age, income, and coverage on dental service utilization during 1996.

Methods. We used data from the 1996 Medical Expenditure Panel Survey.

Results. Edentulous and poorer older adults are less likely to have coverage and less likely to report a dental visit than dentate or wealthier older adults.

Conclusions. These analyses help to describe the needs of older adults as they cope with diminishing resources as a consequence of retirement, including persons previously accustomed to accessing oral health services with dental insurance. (*Am J Public Health.* 2004;94:759–764)

METHODS

We focused on utilization of dental care services among older adults and the effect of income and coverage associated with dental care use during 1996 for the US noninstitutionalized population. We used data from the 1996 MEPS, a nationally representative health survey of the US noninstitutionalized population sponsored by the Agency for Healthcare Research and Quality. Specifically, national estimates are provided for income (poverty status), the percentage with dental coverage, and the percentage of the older adult population that visited a dentist during 1996.

We conducted multivariate analyses to measure the effect of income and age associated with dental coverage status after control for various socioeconomic and demographic variables. In addition, we conducted multivariate analyses to measure the effect of income, age, and dental coverage status associated with dental care services use, and we controlled for various socioeconomic and demographic variables. The variable for dental coverage indicates whether participants were enrolled in a dental plan or actually received private payments on their behalf for dental care obtained during 1996.

To ensure sufficient numbers to produce reliable national estimates, sociodemographic variable categories were combined when necessary. All estimates and statistics reported

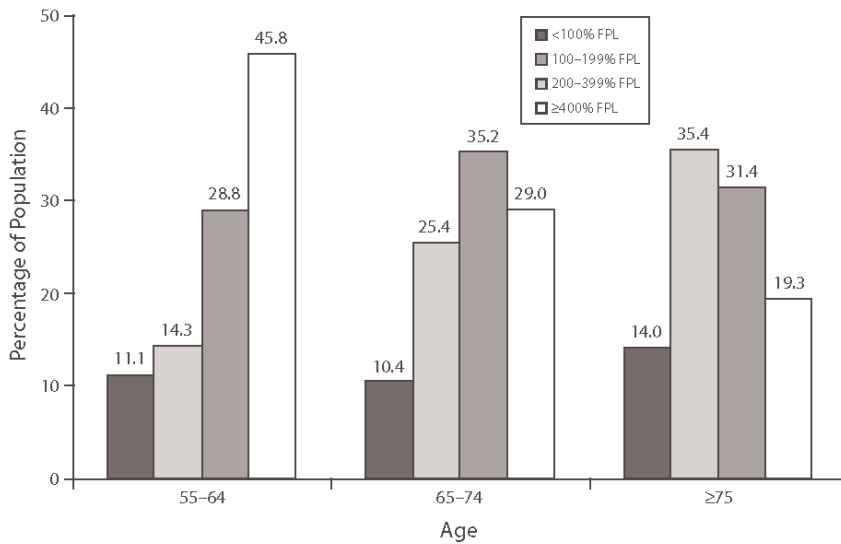
were computed taking into account the complex sampling design of MEPS with the use of the SUDAAN software package.⁹

RESULTS

There were 4272 participants aged 55 years or older in the 1996 MEPS, representing 54 874 943 noninstitutionalized US adults. Forty-two percent (n=1808) of participants were between the ages of 55 and 64 years, 34% (n=1472) were between the ages of 65 and 74 years, and 27% (n=1167) were aged 75 years or older.

Figure 1 shows the population distribution according to age and family income. Older cohorts were less wealthy than younger cohorts, with a progressively smaller ($P<.05$) percentage of older adults with higher incomes (greater than or equal to 400% of the federal poverty level) and a progressively larger ($P<.05$) percentage with low incomes (100% through 399% of the federal poverty level).

Figure 2 displays the percentage of the population with dental coverage by age. Older cohorts were less likely ($P<.05$) to have dental coverage than younger cohorts. Figure 3 displays the percentage of the population with a dental visit by age. The oldest cohort (aged 75 years or older) was less likely ($P<.05$) to have a dental visit than younger cohorts (aged 55 to 64 years and 65 to 74 years).



Note. FPL = federal poverty level.

FIGURE 1—Population distribution by family income and age group.

Table 1 shows private dental coverage status, the percentage of the population who had made at least 1 dental visit during 1996, the number of visits per person for those who had made a dental visit, and the mean total expenditure for older adults with a dental visit by selected population characteristics. Overall, 34% (n=18 598 065) of all older adults had private dental coverage during 1996. Differences in rates of coverage were noted for the categories race/

ethnicity, income, age, gender, education, and rural/urban character of county of residence. Overall, 43% (n=23 459 821) of all older adults reported a dental visit during 1996. The mean total expenditure for those with expenditures was \$428, and the mean number of visits for those with a visit was 2.88. Differences in the likelihood of a visit were noted for the categories presence of teeth, dental insurance coverage, race/ethnicity, income, age, education, and rural/urban character of county of residence. For those with a visit, less variation was observed in the mean number of visits and mean expenditures than for those without a visit. Surprisingly, although the presence of teeth had a profound effect on the likelihood of a visit, it did not appear to have an effect ($P>.05$) on the mean number of visits or mean expenditures. Coverage and income were both associated with the likelihood of a dental visit, but only coverage appeared to have an effect ($P<.05$) on the mean number of visits or mean expenditures.

Table 2 shows the logistic regression results for the probability of having private dental care coverage (columns 1 and 2) and for the probability of having at least 1 dental visit during the year (columns 3 and 4). Explanatory variables in the coverage equation in the first 2 columns include presence of teeth, gen-

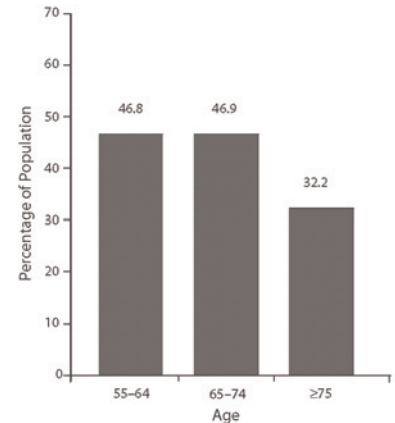


FIGURE 3—Prevalence of reporting a dental visit during 1996, by age group.

der, race/ethnicity, family income, education, and metropolitan/nonmetropolitan status. Although the second set of columns in Table 2 includes these explanatory variables, it also includes a dental coverage status variable. Results of the dental coverage equation in the first 2 columns of Table 2 show that persons in older (aged 65 to 74 years and 75 years and older) cohorts were less likely ($P<.05$) to have coverage than persons in the younger (aged 55 to 64 years) cohort reference group. Results show that older adults with teeth were more likely ($P<.05$) to have coverage than older adults without teeth. Data also show that poor, low-income, and middle-income older adults were less likely ($P<.05$) to have dental coverage than wealthier older adults (reference group=high income). Interestingly, although older Hispanic adults were less likely ($P<.05$) to have coverage, older Black non-Hispanic adults were no less ($P>.05$) likely to have coverage than older White non-Hispanic (reference group) adults. Older male adults (reference group), older college graduate or high school graduate adults, and older adults residing in large or small metropolitan counties were more likely ($P<.05$) to have coverage than older female adults, older adults who did not graduate from high school (reference), and older adults residing in nonmetropolitan counties (reference). Results of the dental use equation in the last 2 columns of Table 2 show that although persons in the middle age

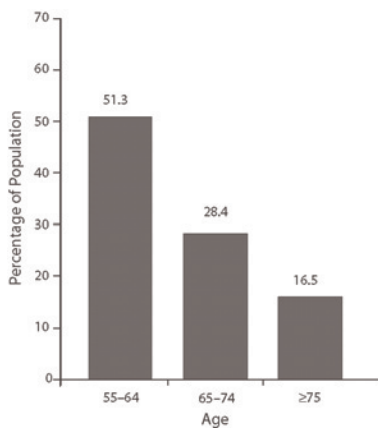


FIGURE 2—Prevalence of dental insurance coverage, by age group.

TABLE 1—Older Adults’ Private Dental Coverage, Report of a Dental Visit During 1996, Mean Number of Visits, and Mean Expenditure per User, by Selected Population Characteristics: United States, 1996

Characteristic	No., Thousands	With Private Coverage, % (SE)	With a Visit, % (SE)	No. of Visits, Mean (SE) ^a	Expenditure, \$, Mean (SE) ^a
Total	54 875	33.73 (1.10)	42.75 (1.15)	2.88 (0.06)	427.70 (18.85)
Dental Coverage					
Covered	18 598	NA	62.58 (1.63)	3.07 (0.09)	498.60 (29.72)
Not covered	36 367	NA	32.66 (1.25)	2.69 (0.09)	358.56 (23.47)
Age, y					
55–64	20 825	51.26 (1.66)	46.82 (1.67)	2.82 (0.08)	413.21 (23.24)
65–74	18 666	28.36 (1.58)	46.90 (1.68)	3.03 (0.12)	454.20 (33.82)
≥ 75	15 384	16.51 (1.34)	32.21 (1.83)	2.73 (0.12)	409.40 (43.37)
Gender					
Female	30 577	29.88 (1.08)	43.36 (1.23)	2.90 (0.07)	439.85 (23.99)
Male	24 298	38.57 (1.45)	41.99 (1.61)	2.84 (0.11)	411.91 (30.21)
Race/ethnicity ^b					
Black non-Hispanic	4 709	25.39 (2.99)	20.99 (2.47)	2.71 (0.22)	434.34 (90.47)
Hispanic	3 130	22.91 (2.74)	28.53 (3.09)	2.70 (0.25)	378.83 (78.70)
White non-Hispanic	47 036	35.28 (1.24)	45.88 (1.29)	2.89 (0.07)	429.42 (19.57)
Education					
College graduate	9 341	51.91 (2.32)	67.40 (2.17)	3.06 (0.12)	449.12 (32.50)
High school graduate	27 410	39.08 (1.40)	47.02 (1.33)	2.90 (0.08)	421.98 (23.55)
Some or no school	17 967	16.34 (1.31)	23.58 (1.43)	2.54 (0.15)	415.72 (58.51)
Family income ^c					
Poor	6 389	13.18 (1.75)	25.12 (1.90)	2.68 (0.20)	366.14 (48.15)
Low	13 170	15.62 (1.45)	29.80 (1.76)	2.80 (0.13)	343.28 (27.31)
Middle	17 396	36.26 (1.85)	43.45 (2.03)	2.91 (0.13)	474.57 (46.70)
High	17 920	51.91 (1.81)	57.88 (1.61)	2.92 (0.09)	435.02 (24.61)
Teeth					
Has teeth	41 117	38.55 (1.24)	53.02 (1.25)	2.88 (0.06)	423.97 (19.71)
Has no teeth	13 702	19.24 (1.52)	11.90 (1.11)	2.84 (0.30)	477.67 (54.53)
Rural/urban county ^d					
Large metropolitan	23 853	38.85 (1.49)	44.94 (1.66)	2.88 (0.06)	508.83 (35.51)
Small metropolitan	18 920	34.65 (1.87)	43.46 (2.24)	3.08 (0.10)	384.85 (24.24)
Nonmetropolitan	12 046	22.20 (2.25)	37.50 (2.38)	2.82 (0.11)	313.15 (28.45)

Note. NA = not applicable. Population without private coverage may include persons with public coverage.

^aFor persons with a visit during 1996.

^bWhite non-Hispanic includes all other ethnic/racial groups not otherwise included among non-Hispanic Blacks and Hispanics.

^cIncludes persons in families with negative income. *Poor* refers to incomes less than 100% of the poverty line; *low income*, 100% to 199% of the poverty line; *middle income*, 200% to 399% of the poverty line; and *high income* 400% of the poverty line or greater.

^d*Large metropolitan* refers to urban counties 1 million acres or more in area, *small metropolitan* refers to other metropolitan counties, and *nonmetropolitan* refers to nonmetropolitan counties, whether or not adjacent to urban counties.

cohort (aged 65 to 74 years) were more likely ($P < .05$) to have a visit, persons in the oldest cohort (aged 75 years and older) were not more likely ($P > .05$) to have a visit than persons in the youngest (aged 55 to 64 years) cohort reference group. Data show that poor and low-income older adults were less likely ($P < .05$) to report a dental visit than wealthier

older adults (reference group=high income). Adults with coverage were more likely ($P < .05$) to report a dental visit than older adults without coverage. When we controlled for income, age, and coverage, older Hispanic and Black non-Hispanic adults were less likely ($P < .05$) to have reported a dental visit compared with White non-Hispanic (reference

group) older adults. Women, college graduates, and high school graduates were more likely ($P < .05$) than male (reference) respondents and persons who did not graduate from high school (reference) to report a dental visit. Rural/urban character of county of residence did not affect ($P > .05$) the likelihood of dental care use.

DISCUSSION

Although these data and analyses are useful, they do have limitations. For instance, self-reporting of data is less accurate than collection by observation or by dental record abstraction, and analyses of data from different survey sources has historically resulted in national estimates that vary.¹⁰ Also, the cross-sectional MEPS may be subject to cohort effects that may limit any longitudinal inferences made. In addition, the specification of the dental coverage variable is a function of both a report of coverage and a report of payment for dental care by a third party. Also, the age at which persons retire or become eligible for Social Security is variable. An increasing number of people are expected to delay retirement until they are between 67 and 70 years old rather than the customary age of 65 years. Finally, individual coverage plans may vary considerably in their degree of benefit generosity.

On the other hand, these data are useful, are comprehensive, and provide estimates that are nationally representative. As such, MEPS data are unique and provide important information from which dental coverage and visits can be compared in the context of age and income. Additionally, although the specification for dental coverage has limitations, its formulation is based on previously used and accepted methods, provides an acceptable nationally representative measure of dental care coverage, and makes possible valuable analyses and comparisons.¹¹

Analysis of MEPS data yields results supporting findings reported elsewhere in the literature regarding the use of oral health care services by adults aged 65 years and older. Older age cohorts were found in this study to be less wealthy, more likely to have fewer teeth, less likely to have dental insurance coverage, and ultimately less likely to have a dental visit than younger age cohorts.

TABLE 2—Adjusted Odds Ratios (AORs) and 95% Confidence Intervals (CIs) for Predictors of Private Dental Coverage and a Dental Visit During 1996: United States, 1996

Characteristic	Predictors of Dental Coverage AOR ^a (95% CI)	Predictors of a Dental Visit AOR ^a (95% CI)
Dental coverage		
Covered	2.53 (2.08, 3.07)
Not covered	1.00 ...
Age, y		
55–64	1.00 ...	1.00 ...
65–74	0.42 (0.35, 0.50)	1.71 (1.40, 2.09)
≥ 75	0.25 (0.20, 0.32)	1.09 (0.85, 1.39)
Gender		
Female	0.80 (0.71, 0.91)	1.50 (1.28, 1.75)
Male	1.00 ...	1.00 ...
Race/ethnicity ^b		
Black non-Hispanic	0.82 (0.61, 1.04)	0.38 (0.26, 0.55)
Hispanic	0.59 (0.41, 0.85)	0.58 (0.41, 0.82)
White non-Hispanic	1.00 ...	1.00 ...
Education		
College graduate	2.31 (1.73, 3.09)	3.18 (2.51, 4.04)
High school graduate	1.93 (1.56, 2.37)	1.68 (1.38, 2.03)
Some or no school	1.00 ...	1.00 ...
Family income ^c		
Poor	0.24 (0.17, 0.34)	0.55 (0.43, 0.71)
Low	0.35 (0.27, 0.45)	0.68 (0.53, 0.86)
Middle	0.80 (0.65, 0.99)	0.82 (0.66, 1.02)
High	1.00 ...	1.00 ...
Teeth		
Has teeth	1.57 (1.23, 1.99)	6.50 (5.12, 8.26)
Has no teeth	1.00 ...	1.00 ...
Rural/urban county ^d		
Large metropolitan	2.07 (1.52, 2.81)	0.93 (0.72, 1.20)
Small metropolitan	1.77 (1.27, 2.46)	0.99 (0.75, 1.30)
Nonmetropolitan	1.00 ...	1.00 ...

Note. Population without private coverage may include persons with public coverage.

^aA given odds ratio is adjusted for all the other variables in the table.

^bWhite non-Hispanic includes all other ethnic/racial groups not otherwise included among non-Hispanic Blacks and Hispanics.

^cIncludes persons in families with negative income. *Poor* refers to incomes less than 100% of the poverty line; *low income*, 100% to 199% of the poverty line; *middle income*, 200% to 399% of the poverty line; and *high income* 400% of the poverty line or greater.

^d*Large metropolitan* refers to central counties 1 million or more acres in area, *small metropolitan* refers to other metropolitan counties, and *nonmetropolitan* refers to nonmetropolitan counties, whether or not adjacent to urban counties.

It is not surprising to find that the older adults most likely to have dental insurance coverage were also the older adults more likely to have teeth, to be of a younger age cohort, and to be from wealthier families. Women, individuals from metropolitan counties, and high school/college graduates were also more likely to have dental insurance. These results help to establish that the current US oral health care delivery system for older

adults is predominately accessed by dentate individuals with private out-of-pocket means or employer-sponsored insurance coverage.

Another important use of the MEPS data in this study was that it allowed a more detailed analysis of the associations between insurance coverage, presence of teeth, age, income, mean number of visits, and expenditures for various population subgroups. When we controlled for potential confounding variables, our findings

showed that having teeth, being female, being a non-Hispanic White, having higher income, having higher education, and having dental insurance coverage were each associated with an increased likelihood of a dental visit. These findings were not surprising and support those of other studies of US adults.¹² Of the previously mentioned variables, when we controlled for relevant confounding variables, presence of teeth showed the highest odds of a dental visit (adjusted odds ratio=6.5). Our findings also showed that adults just older than the typical retirement age (65 to 74 years) were significantly more likely to visit the dentist than were persons younger than the typical retirement age (55 to 64 years). This association with age, which was revealed when we controlled for confounding variables, was surprising, was not found in the descriptive table, and has not been shown in other national studies. We speculate that utilization may have increased because these individuals perceived that they had a distinct window of time in which they had more free time and more disposable income to receive as many services as needed. But for many postretirement older adults, both the perception and the reality of more disposable income may diminish in time, and the propensity to consume dental benefits could wane.

The importance of these findings and their policy implications become clearer when we ponder a generational cohort effect that is about to take place in the United States. The earliest age cohorts of the “baby boom” generation, comprising approximately 77 million people, or nearly a third of the US population, will be approaching retirement age by 2010, beginning a phenomenon that will only continue over the following 20 years. Although the White-non-Hispanic population aged 65 years and older is expected to grow by 81% between 1999 and 2030, the population of older minorities is expected to grow by 219% during this same time span.^{13,14} Other current trends to consider in the future for this burgeoning older adult group include an increase in educational level (the percentage completing high school rose from 28% in 1970 to 70% in 2000), a reduction in overall poverty rates (a historic low for this group was reached in 1999 with a nearly 3% increase for men and 2% increase for women in real income since 1998), a recent rise in life expectancy at the

age of 65 years (an additional 17.9 years), and an approximate 30% decrease in labor force participation since 1968 (17.7% for men aged 65 years and older in 2001).^{13,14} Of further concern will be the plight of the increasing number of older persons who will live to the age of 75 and beyond, when it is expected that their long-term needs will accelerate because of disability, limitations in carrying out activities of daily living, and institutionalization.

Further, the burgeoning cohort of baby boomers now reaching old age coincidentally was born at the same time that water fluoridation was widely introduced in the United States in the late 1940s and early 1950s.¹⁵ As a result of this public health measure as well as the introduction and increased use of fluoride dentifrices and other preventive measures, these individuals enter their retirement years with healthier and more teeth than past age cohorts. Edentulism, which is higher in families below the federal poverty line, has declined precipitously over the years, with the most marked decrease found in the oldest age groups.¹⁶ This study demonstrates that dentate status plays a significant role in dental utilization patterns for older adults, with dentate individuals considerably more likely to use the oral health care delivery system than edentate persons. Yet if current trends are maintained, dentate status over time will play a less important role in health service research analyses because of the declining proportion of older adults who will be edentulous.

Our study found that dental insurance coverage also plays an important role in dental care utilization. Perhaps the greatest challenge facing the baby boom generation and the oral health care delivery system will be the loss of employer-sponsored dental insurance subsequent to retirement. A high proportion of this population's access to the dental health care system has been facilitated because of employer-sponsored dental insurance. Consequently, this generation has developed an expectation that its oral health status will be maintained through continued access to oral health preventive and treatment services subsidized by dental insurance plans.

Approximately 22.6 million employees receive employer-sponsored dental insurance, with about 60% of full-time employees at least offered dental benefits by their employ-

ers.¹ These employees generally work in medium-to-large firms and are more likely to be in professional and technical occupations than in blue-collar and service-related jobs.¹ However, this population's effective demand for oral health care achieved in the past may be increasingly compromised in retirement by the loss of these benefits and diminishing personal disposable income.

Our study found that lower-income adults without dental coverage, including individuals from minority groups, are less likely to access dental services than their upper-income peers. This trend would likely extend into retirement years because the prospect of having enough disposable income to pay for dental services would remain low. Further, Medicare does not cover routine dental services, and less than half the states in their Medicaid programs provide preventive and restorative dental services for adults older than 21 years.¹⁷ Unlike coverage for children, Medicaid dental benefits for adults are not mandated; consequently, many of the state Medicaid dental programs covering adults do not provide coverage for those aged 65 years and older, provide only a limited dental benefit schedule, offer low reimbursement for services, and have often been subject to budget cuts or elimination.¹⁷

Despite the considerable dental needs found in lower-income older individuals, the perceived need may be low and may be a primary explanation, in addition to cost, for the traditionally scant or intermittent patterns of their dental utilization. As this and other studies show, perceived need, want, and related access to dental services may be limited in lower-income individuals, especially those who are partially or totally edentulous.^{18,19} Conversely, if a perceived need concerning oral health problems is present, then the potential service demand for this low-income population may be dampened if not diminished by years of poor expectations.

The only elderly retirement age subgroup that would be relatively assured of continued access to dental services would be upper-income adults, who were found in this study to have better access to dental services than low-income subgroups. Assuming that oral health attitudes and behaviors remain steady, it is possible that some in this population

might substitute out-of-pocket payments for care previously paid for by insurance. On the other hand, some upper-income adults might find securing dental care to be more difficult because of a progressive loss of disposable income. As such, additional study is needed to determine the extent to which recent retirees might be willing to pay for care previously covered by insurance.

Middle-income older adults may be the most affected in retirement by the loss of their employer-sponsored dental insurance. Unlike upper-income older adults, middle-income older adults might not have access to sufficient disposable income to afford the cost of dental care. On the other hand, many dentate individuals in this cohort have come to expect to increasingly seek dental services as part of their acquired preventive attitudes and behaviors.²⁰ Hence, soon after retirement this group may be placed in a position in which it is unable to effectively secure the dental care desired.^{21,22} Over time, an increasingly larger proportion of this subgroup may find it difficult to obtain dental care. As such, an increasing inability to pay for dental care may place middle-income older adults at higher risk for undetected oral diseases, including oral and pharyngeal cancers.

Disabled, homebound, and institutionalized older adults will be additionally burdened by a loss of benefits and income. This group tends to spend down any disposable income regardless of economic status because of their disability and need for expensive services. The extent of their oral health care needs and the lack of programs to address these needs are well documented in the literature.^{23–26}

Although opportunities to receive dental coverage among retirees are limited, some retirees do have the option of continuing or purchasing postretirement health insurance as an extension of their employer-based health insurance plans. Postretirement coverage is sometimes made available through employer-sponsored postretirement health benefits or limited term continuation coverage such as that provided by the Consolidated Omnibus Budget Reconciliation Act, 1985 (COBRA).²⁷ Insurance premiums for postretirement health benefits are often employer subsidized and may be generally similar to premiums incurred while an employee.

Conversely, premiums under COBRA, which may provide continuation health insurance coverage for the first 18 months after retirement, are often not employer subsidized and may continue benefits at up to 102% of the nonsubsidized employer group rate. As an upgrade to COBRA, the 1996 Health Insurance Portability and Accountability Act (HIPAA) now extends the ability of employees with health insurance in smaller firms (20 or fewer employees) to have guaranteed purchasing privileges for private individual plans.²⁷ It also allows workers with expired 18-month COBRA coverage without preexisting health conditions to purchase individual health insurance plans. However, the premiums for all individual private benefit plans are considerably more expensive than those covered under COBRA and may not be available for dental services.²⁷ For the subgroup of older adults with a higher likelihood of a having a dental visit, an extension of postretirement coverage may provide some older adults some relief as they face this increasing challenge.

More people will be at risk for oral or tooth-specific disease in future age cohorts because teeth are not being lost prematurely and more people are living longer. In a similar vein, studies continue to report lower oral disease rates with each older adult age cohort because of the same improved healthy lifestyles and increased access to dental preventive and treatment regimens that are responsible for the increase in retained teeth. Only older adults from lower socioeconomic backgrounds have not benefited from this cohort effect. Consequently, new dental health care delivery strategies and approaches may be needed to address the changing needs and demographics of this burgeoning population. Further research evaluating the health service needs, demands, and financing of oral health services for older adults and retirees will be helpful, especially in the assessment of those individuals accustomed to accessing oral health preventive and treatment services through dental insurance. Such research also will help the profession better prepare to address needs of the increasing number of baby boomers coping with impending retirement. ■

About the Authors

The authors are with the Department of Health Promotion and Policy, University of Maryland School of Dentistry, Baltimore. Richard J. Manski is also with the Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality, Rockville, Md.

Requests for reprints should be sent to Richard J. Manski, University of Maryland School of Dentistry Department of Health Promotion and Policy, 666 W Baltimore St, Baltimore, MD 21201 (e-mail: manski@dental.umaryland.edu).

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Contributors

R.J. Manski conceived and supervised the study and supervised the analyses. M.D. Macek assisted with the analysis. B.C. Reid and H.S. Goodman assisted with the writing.

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Human Participant Protection

No protocol approval was needed for this study.

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