Utilization of Dental Services in the United States and an Insured Population

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Abstract: Dental service utilization rates among 1.2 million Pennsylvania Blue Shield dental insureds are compared to rates in the US population. Insurance appears to stimulate the utilization of dental services above national norms; children appear to be a major beneficiary of insurance's incentive effect on dental service use. The implications of these findings for health planners and dental insurance providers are discussed. (*Am J Public Health* 1985; 75:87–89.)

Introduction

Dental disease is a serious public health problem in the United States affecting all age groups.[1–3] One cause of this problem is the gap between dental needs and the demand for dental care. Although dentists agree that regular dental visits are essential for maintaining proper oral health,[4] national studies estimate that only 41 to 50 per cent of all Americans visit the dentist each year.[5,6] One reason for these low utilization rates is the price of dental care. In the US about 77 per cent of dental costs are paid out-of-pocket by the patient.[7] In a national survey, price was the most frequently specified barrier to dental care; 50 per cent of the population thought dental prices were too high.[8] Dental insurance reduces—but does not eliminate—this price barrier and should, therefore, stimulate demand.[9]

No estimates of national US insured dental demand presently exist in the literature. However, annual utilization rates (i.e., the percentage of insureds receiving any dental services in a given year) for dental insureds in specific companies, unions, and early dental insurance programs ranged between 16 and 62 per cent, averaging approximately 46 per cent across studies.[10–14] These studies suggest that dental insurance increases utilization only slightly.[15] Because these utilization rates are dated and based on a small number of insureds and employers, their representativeness of insureds nationwide is unclear. We examined dental service utilization rates in a large, insured population and compared these rates with those in the US population.

Methods

The study population consists of 1.2 million adults and children covered by Pennsylvania Blue Shield (PBS) under its usual, customary, and reasonable (UCR) dental program in 1980. The population is diverse, coming from areas with a wide variety of dentist-population ratios, urban, suburban, and rural living conditions; both large, experienced-rated and small, community-rated employer groups are included in the population; a fairly uniform distribution of occupational groups exist (although professional, technical, and kindred workers dominate, comprising about 30 per cent of all employees).

A description of the benefit program is presented in Table 1. All PBS insureds receive basic dental benefits at coinsurance rates ranging between zero and 20 per cent. Coverage for other dental services is provided through four optional riders, each chosen by the employer group, and each having its own coinsurance rate (ranging between zero and 50 per cent). Over 35 unique combinations of basic and rider A through D benefits exist in the population. None of the insureds had a deductible in their dental plans, but about 10 per cent of the employees paid some of the premiums for their dental coverage. In short, because of the substantial environmental, sociodemographic, and dental program variation throughout the population, the study's population may be more representative of insureds nationwide than of past studies.

Using March 1981 dental enrollment files, a systematic random sample of 11,260 households was selected, containing approximately 19,592 employees and their dependents. Using methods developed by Dillman,[16] a 55-item mail questionnaire was designed to collect household and family member information regarding dental demand determinants. A 57 per cent response rate was achieved with two follow-up mailings to nonrespondents, yielding 8,760 adults and 4,209 children who were covered in 1980. Dental demand information was extracted from 1980 PBS claims data and merged with the survey data to form the study's insured data base. Utilization was defined as the percentage of insureds who received any dental services (and therefore filed at least one dental claim) in 1980. Comparisons of dental service utilization and expenditures for specific dental plans among respondents and the PBS population indicate that the sample's utilization rates are generally representative but slightly lower than those in the PBS dental population.

Estimates of dental service utilization in the US population were taken from the 1977 National Medical Care Expenditures Survey (NMCES).[6] Because greater utilization levels were expected for insureds than the US population, one-tailed difference of means t-tests were performed. Similar tests were also performed for specific age, education, income, and sex groups.

Results

The annual insured utilization rate (as defined by us) for all sampled PBS insureds is 54 per cent and is significantly greater than the 41.1 per cent US rate (Table 2). The US utilization rate includes the elderly while the PBS rate, for the most part, does not, however. Accordingly, Table 2 also presents similar utilization rate comparisons for specific age groups and categories of dental insureds. All of the insured utilization rates for employees and children are significantly greater than in the US population. Only spouse dependents aged 19–24 have a utilization rate below the US rate.

Table 3 presents PBS insured and US dental utilization rate comparisons for various sex, education, and income

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TABLE 1—Pennsylvania Blue Shield UCR Dental Insurance Program

	Plan Category	Services Covered	Per Cent of Households with Coverage	Average Coinsurance Rate (%) among Households with Coverage
Required	Basic	Diagnostic, preventive restorative, endodontic services, simple extractions	100	2
Optional Riders	A	Oral surgery: surgical removal of teeth, intrabony cysts, apicoectomy, crowns*	60	11
	B	Prosthodontics: complete and partial dentures, bridge pontics and crowns**	56	29
	C	Periodontal services: gingivectomy, osseous surgery, scaling and root planing	54	24
	D	Orthodontic services	50	29

*American Dental Association codes 2710–2893.
**American Dental Association codes 6710–6793.
UCR = Usual, customary and reasonable.

TABLE 2—Annual Dental Utilization Rates for the US Population and Pennsylvania Blue Shield Insureds

Population Characteristics	US Population* (1977)	1980 Pennsylvania Blue Shield Insureds			
		All Adults	Employees	Spouses	Children
Total	41.1	54.8	57.9	49.7	52.0
Age (years)					
less than 6	13.8	—	—	—	21.1
6 to 18	50.9	—	—	—	61.0
19 to 24	40.8	50.9	52.1	26.3**	—
25 to 54	44.1	56.5	59.3	51.9	—
55 to 64	41.6	51.0	54.7	46.7	—

*SOURCE: National Center for Health Services Research.[6]
**Insured utilization rate is *not* significantly different ($p < .05$) from the US rate in the predicted direction; all other insured utilization rates are statistically significant as predicted.

groups. Again, for employee and spouse insureds, the variation in utilization rates across sex, education, and income groups follows US utilization patterns but at higher levels. Employee insureds who are female or have high incomes or education have higher utilization rates (over 60 per cent) than other adult insureds and the US population. One of the most significant findings is the substantially higher insured utilization rates for children in households with a low family income (53 per cent) or a parent who did not complete high school (70 per cent).

Discussion

Consistent with past research, annual dental insurance increases dental service utilization above national norms for most sociodemographic groups. The major beneficiary appears to be children from low-income families and/or who have parents with little formal education.

Given the assumption that increased utilization improves oral health, public or private dental insurance programs are important public health measures.[17,18] Recent cutbacks in federal health programs providing free or low-cost dental care to low-income families (such as Medicaid) may reduce utilization and threaten the oral health of program participants. However, whether a positive relation exists between utilization and oral health should be validated in a careful empirical study before pressing these inferences further.

Dental insurance can affect both the per cent of insureds visiting the dentist annually and the intensity of services received among users. We are currently investigating the effect of coinsurance on the latter parameter.

Planners may wish to use the insured dental demand estimates in Tables 2 and 3 in forecasting future dental demand and manpower requirements. If the sociodemographic characteristics of the group's employees and dependents are known (or can be estimated), the demand statistics in Tables 2 and 3 may be used to estimate future employer group dental demand and dental insurance premiums. Dental insurers using this procedure should evaluate its impact on

TABLE 3—Annual US-Insured Utilization Rate Comparisons by Sex, Education, and Family Income Group

Population Characteristics	US Population* (1977)	1980 Pennsylvania Blue Shield Insureds			
		All Adults	Employees	Spouses	Children
Sex					
Male	38.6	51.6	56.1	39.5#	51.2
Female	43.3	57.8	60.2	55.2	53.6
Education (years)**					
Less than 9	25.8	37.0	38.5	34.7	69.6
9 to 11	34.4	37.2	38.1	36.1#	52.2
12	42.8	52.5	54.3	50.2	53.4
13–15	49.9	56.8	59.6	52.1#	52.3
16 or more	60.4	62.1#	65.4	53.9#	50.6
Family Income					
Less than $12,000	30.8	43.8	45.7	37.4#	52.8
$12,000 to $19,000	41.5	53.0	55.3	48.5#	49.2
Over $20,000	50.1	56.9	61.4	50.7#	53.4

*SOURCE: National Center for Health Services Research.[6]
**Education of family head in the US population. Education of the adult in the Pennsylvania Blue Shield sample.
#Insured utilization rate is *not* significantly different ($p < .05$) from the US rate in the predicted direction; all other insured utilization rates are statistically significant as predicted.

actuarial risk and adverse selection within their programs.* If risk is reduced significantly, insurers may wish to expand their dental programs by increasing both the types of dental programs offered to employer groups and the number of US dental insureds. The increased utilization prompted by these changes could ultimately have beneficial effects on US oral health.

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*When persons enroll in a dental insurance plan, each has different dental care needs which are (partially) known to the employee but not to the insurer. Adverse selection occurs when employee choice of plan is positively correlated with a high need for dental care, which may result in initially high rates of dental demand.