

GROUP DENTAL EXPENSE INSURANCE EXPERIENCE

RICHARD E. ULLMAN

ABSTRACT

This paper develops net claim costs for each major type of dental service, using experience data under group dental contracts covering 250,000 persons. The period of the experience is mid-1974 through mid-1977. The paper may be used as a tool in the development of group dental experience insurance premium rates and in the analysis of experience. Orthodontia experience is not included.

BLUE CROSS AND BLUE SHIELD of Greater New York covers about 425,000 persons for dental expense insurance. The great majority are insured through groups; a few have individual contracts. In order to study the frequency of dental services, we selected thirty of the larger groups—these cover 103,200 employees and about 250,000 persons overall. We obtained the number of services performed for each of 273 procedures, using the definitions of the American Dental Association. (This study excludes orthodontia treatment.) These 273 procedures are categorized as follows:

Diagnostic.....	24
Preventive procedures other than restorations.....	12
Restorations.....	36
Endodontics.....	19
Periodontics.....	21
Prosthodontics, removable.....	44
Prosthodontics, fixed.....	23
Oral surgery.....	63
Repair procedures other than oral surgery.....	11
Other services.....	20
Total.....	<u>273</u>

We used experience from three time periods as indicated below:

1. Claims incurred from July 1, 1974, through June 30, 1975, and paid from July 1, 1974, through December 31, 1975.
2. Claims incurred from July 1, 1975, through June 30, 1976, and paid from July 1, 1975, through December 31, 1976.
3. Claims incurred from July 1, 1976, through June 30, 1977, and paid from July 1, 1976, through December 31, 1977.

For each of these time periods we obtained from our electronic data processing department the number of times each dental service was performed for an adult and the number of times it was performed for a child. Adults are persons aged 20 and over, and children are persons aged 19 and under. The definition of age is the age last birthday on the day that the dental service was performed.

Of the 273 procedures, we selected for the study 44 procedures that represented 91.1 percent of dental claim costs. The number of services performed for each of these procedures for each group became the numerator of the fraction used to obtain frequency. For the denominator we used known subscriber data together with an estimate of the number of adults and children covered. Our in-force data consist of the number of single employees covered and the number of employees with families covered. The former are called individual certificates and the latter family certificates. The number of adults covered is equal to the number of individual certificates plus 1.9 times the number of family certificates; the number of children is equal to 1.6 times the number of family certificates.

These factors were derived from 1970 federal census data for New York State. We recognize that the use of federal census data is not the ideal and that it is always preferable to be able to use the actual average family composition of each group in the study. Because many if not most of our group dental contractholders do not maintain family census data, it was impractical for us to obtain such data, and we believe that the federal census data we have used are reasonably representative of our groups. Perhaps the biggest question with these factors is the assumption of 1.6 children per family contract. Birth rates have been declining since 1970, and 1.6 might be somewhat high for the three middle years of the 1970s, which are being studied here. Offsetting this is the fact that several of the groups in this study are known to have unusually large numbers of children. It also must be noted that the factor of 1.6 children per family is of no consequence to our company in determining net claim costs. Thus, the rate of occurrences per thousand children was determined by dividing the number of services for children by the product of 1.6 and the number of family contracts, and the net claim costs for the children portion of the family rate were obtained by multiplying the unit claim costs for a child by 1.6, rendering the 1.6 factor of no mathematical consequence. Of course, in using the data in this paper for groups in other geographical areas that may, perhaps, have different demographic characteristics, the average number of children per family would have to be adjusted appropriately.

The frequency of many dental services is a function of the length of

time the dental coverage has been in force. During the first year that dental benefits exist, utilization is generally high because the existence of the program removes much of the economic deterrent to visiting the dentist. As a result, persons who have neglected their dental needs for some time will be heavy utilizers in the first year. In the second year, there almost always is a decrease in utilization from that of the first year.

In order to avoid undue weighting by duration of coverage, we have combined each of the three years of experience. In addition, a significant portion of our exposure is from groups that had dental coverage with a previous carrier; this removes some of the effect of "catch-up" dentistry from our data.

We have calculated two frequency factors for each service, one being the arithmetic mean of the frequency for each of the groups and the other being the weighted average frequency of the groups. This weighted average frequency, since it is weighted by size of group, is simply the average for all subscribers covered by all the groups selected for this study. We also have calculated the standard deviation of the first of these means. These data appear in Appendix I. Generally, the two means are fairly close. For the purpose of developing our own dental rating manual, we have chosen to use the arithmetic mean rather than the weighted average mean as being more truly representative of an average population. However, the use of the weighted average mean would not produce very significantly different net claim costs. In retrospect, we feel it was desirable to calculate both amounts, if only to assure ourselves that the overall results are not unduly affected by two or three jumbo groups.

As opposed to, say, surgical insurance, over 90 percent of the dollar value of a dental program is accounted for by fewer than fifty procedures. For surgical insurance, it probably would be necessary to include data from several thousand procedures in order to account for 90 percent of the dollar value of the program. In Appendix I, we have calculated the dollar value of each dental procedure selected for this study as the product of the number of services incurred under all groups in the year beginning July 1, 1976, and the appropriate allowance for each procedure. In order to produce uniform results, we have used a schedule of allowances in lieu of actual claim dollars.

Appendix I indicates that the procedures selected for each broad category produce sufficient dollars to represent that category adequately except for "repair procedures other than oral surgery" and "other services," categories that are sufficiently small to be rated in connection with other categories. The table on page 290 shows the percentages by categories. For the two categories for which no procedures were se-

Category	Number of Procedures Selected	Total Number of Procedures	Ratio of Dollar Value for Selected Procedures to Dollar Value for All Procedures
Diagnostic procedures.....	7	24	96.1%
Preventive procedures other than restorations.....	3	12	94.6
Restorations.....	14	36	95.1
Endodontics.....	3	19	89.9
Periodontics.....	4	21	77.8
Prosthodontics, removable.....	5	44	77.6
Prosthodontics, fixed.....	5	23	96.8
Oral surgery.....	3	63	72.9
Repair procedures other than oral surgery.....	0	11	0
Other services.....	0	20	0
All services combined.....	44	273	91.1%

lected, the combined dollar exposure is only 0.37 percent of the total dollar exposure. The lowest percentage for a category for which procedures were selected is 72.9 percent for oral surgery, which nevertheless is comfortably large.

We recognize that this study does not analyze variations in utilization by many of the common demographic and other characteristics. Thus, except for the adult-child split, we do not have an age breakdown. Neither is there an analysis of utilization by sex or occupational status of the insured. Other elements that typically have an effect on utilization but are not analyzed in this study are the extent of the employer contribution; the effect of deductibles, coinsurance, and maximums; the scope of the benefits (the existence of benefits for prosthodontics is known to increase utilization of basic services such as preventive, diagnostic, and restorations); previous history of coverage; and geographical distribution (all our experience is in New York City, Long Island, and ten upstate counties that are contiguous to New York City).

Among the groups selected for this study, there is a wide variation in benefit programs. Thus, there are "usual, customary, and reasonable" (UCR) benefits at 100 percent, 80 percent, and 50 percent, and there are scheduled benefits selected from among five different schedules. In addition, there are significant variations in scope of coverage. Some groups have a program of comprehensive coverage, others have plans limited to basic services (prosthodontics and orthodontia are excluded), and there are some plans with deductibles. Appendix III shows the distribution of groups by type of dental program. Because of these con-

siderable variations in coverage, we believe it would not have been worthwhile to analyze our data demographically and by the other factors that have been enumerated. The technique of comparing the weighted average mean and the arithmetic mean for each procedure assures us that the frequencies we selected to develop a dental rate manual are reasonably representative of an average population and are not influenced unduly by any skewness in our sample.

In Appendix II we have developed claim costs for each broad category of dental service. The utilization rates are the arithmetic means from Appendix I multiplied by 1.02323. This factor is used to obtain "ultimate" incurred claims for the aggregate of the three twelve-month periods used in this study, that is, it is the factor needed to convert claims incurred in a twelve-month period beginning July 1 of year n and paid in the eighteen-month period beginning July 1 of year n and ending December 31 of year $n + 1$ to ultimate incurred claims. The factor of 1.02323 is arrived at from paid dental claims data sorted by month of incurrence, the kind of data that commonly are used to prepare a claim payout "triangle." The allowances in Appendix II are reasonably representative of the level of dentists' charges in the area served by this Blue Cross-Blue Shield plan, namely, New York City, Long Island, and ten contiguous upstate counties.

Factors A in Appendix II "complete" the claim costs for each set of procedures, that is, they convert the claim costs from those for the sample of procedures selected for the study to those for all procedures within each broad category of procedures. Factor A for each category comes from Appendix I and is determined by taking the ratio of (1) to (2), where (1) is the sum of the products of the number of services and the allowance for each procedure selected for this study and (2) is sum of the products of the number of services and the allowance for all procedures whether or not selected for the study. Data for procedures not selected for the study do not appear in Appendix II; they are available in the author's files.

The number of services used in developing these factors is the number incurred for all groups from July 1, 1976, to June 30, 1977, and paid through December 31, 1977. Here we used only one year of data instead of the three years that we used to obtain rates of occurrence per 1,000 persons per year. A considerable amount of manual work is involved in combining three years of data, and the Factors A are ratios (relative amounts) that vary only slightly from year to year, whereas the rates of occurrence are absolute amounts that vary significantly from year to year.

Using the utilization rates and schedule of allowances as described, we can calculate the monthly claim costs for a program of comprehensive benefits as \$13.63 for an individual and \$34.45 for a family.

Exclusions

In addition to the limitations mentioned in the appendixes, the data also reflect the following exclusions: gold-foil restorations; appliances or restorations used solely to increase vertical dimensions; periodontal, provisional, or temporary splints; temporary crowns; occlusal adjustments; implants; and bridges or dentures involving implants.

Orthodontia

Orthodontia treatment is excluded from this study because reliable experience takes several years to develop because of the length of treatment, usually two to three years. Many of our groups with orthodontia benefits have been in effect for relatively short time periods; others that have been in effect for several years are groups with relatively large family sizes. We felt, therefore, that our orthodontia data would not be of value on an industry-wide basis.

APPENDIX I

UTILIZATION DATA FOR DENTAL SERVICES

AMERICAN DENTAL ASSOCIATION CODE NUMBER (1)	DESCRIPTION OF PROCEDURE (2)	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE (9)	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77 (10)	AGGREGATE DOLLAR VALUE ((9) × (10)) (11)	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
Diagnostic Procedures													
0110.....	Oral exam (initial)	199	228	74	95	180	239	\$10	48,577	\$485,770			
0120.....	Oral exam (periodic)	126	165	57	95	119	188	10	45,605	456,050			
0210.....	X-rays (full mouth)	167	122	65	64	171	140	25	28,042	701,050			
0220.....	X-ray (first P.A.)	138	166	49	78	127	179	5	47,862	239,310			
0230.....	X-ray (additional P.A.)	239	285	87	134	219	305	2	88,553	177,106			
0270.....	X-ray (bitewing, first)	144	271	62	127	119	275	5	56,315	281,575			
0280.....	X-ray (bitewing, additional)	298	479	122	241	250	492	3	112,277	336,831			
Sum of cols. 10 and 11 for 7 procedures selected									427,231	\$2,677,692	96.1%	95.3%	97.3%
Sum of cols. 10 and 11 for 17 procedures not selected (0211, 0240, 0250, 0260, 0290, 0310, 0321, 0330, 0340, 0390, 0410, 0420, 0430, 0440, 0460, 0470, 0490)									4,827	107,614			
Sum of cols. 10 and 11 for all 24 diagnostic procedures									432,058	\$2,785,306			

NOTE.—The data reflect the following limitations: (1) benefits for procedures 0110 and 0120 are provided not more than twice a year; (2) benefits for procedure 0210 are provided not more than once every three years.

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER (1)	DESCRIPTION OF PROCEDURE (2)	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE (9)	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77 (10)	AGGREGATE DOLLAR VALUE [(9)X(10)] (11)	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
Preventive Procedures, Other than Restorations													
1110.....	Prophylaxis (adult)	381	191	126	84	341	187	\$ 20	75,267	\$1,505,340			
1120.....	Prophylaxis (child)	0	276	0	150	0	312	15	29,765	446,475			
1220.....	Stannous fluoride treatment to age 19	0	141	0	80	0	155	15	15,320	229,800			
Sum of cols. 10 and 11 for 3 procedures selected									120,352	\$2,181,615	94.6%	99.99%	89.3%
Sum of cols. 10 and 11 for 9 procedures not selected (1210, 1230, 1310, 1330, 1350, 1510, 1515, 1520, 1530)									6,248	124,925			
Sum of cols. 10 and 11 for all 12 preventive nonrestorative procedures									126,600	\$2,306,540			

NOTE.—The data reflect the following limitations: (1) benefits for procedures 1110, 1120, and 1220 are provided not more than twice a year; (2) benefits for procedure 0210 are provided not more than once every three years.

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER (1)	DESCRIPTION OF PROCEDURE (2)	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE (9)	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77 (10)	AGGREGATE DOLLAR VALUE [(9) X (10)] (11)	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
Restorations													
2110	Amalgam, primary, silver filling, 1 surface	0	59	0	34	0	78	\$ 14	6,764	\$ 94,696			
2120	Amalgam, primary, silver filling, 2 surfaces	0	106	0	66	0	139	20	12,402	248,040			
2130	Amalgam, primary, silver filling, 3 surfaces	0	18	0	13	0	24	30	2,221	66,630			
2140	Amalgam, permanent, silver filling, 1 surface	221	404	59	175	225	428	15	69,006	1,035,090			
2150	Amalgam, permanent, silver filling, 2 surfaces	335	302	97	131	349	291	24	72,423	1,738,152			
2160	Amalgam, permanent, silver filling, 3 surfaces	139	80	48	32	153	77	33	28,369	936,177			
2161	Amalgam, permanent, silver filling, 4 surfaces	19	10	6	6	19	9	44	3,532	155,408			
2310	Acrylic, plastic filling, 1 surface	225	88	79	39	235	87	20	37,251	745,020			
2311	Acrylic, plastic filling, 2 or more surfaces	25	7	10	4	25	8	40	6,108	244,320			
2720	Crown, plastic with metal	38	6	25	8	50	5	225	5,991	1,347,975			
2740	Crown, porcelain	9	3	8	1	11	3	230	1,256	288,880			
2750	Crown, porcelain with metal	37	5	24	3	43	5	250	6,497	1,624,250			
2790	Crown, cold cast	7	1	4	0	7	1	225	930	209,250			
2891	Post, crown support	27	5	13	3	24	5	75	4,263	319,725			
Sum of cols. 10 and 11 for 14 procedures selected									257,013	\$9,053,613	95.1%	95.1%	94.9%
Sum of cols. 10 and 11 for 22 procedures not selected (2131, 2170, 2171, 2210, 2211, 2320, 2410, 2420, 2430, 2510, 2520, 2530, 2540, 2610, 2710, 2810, 2830, 2840, 2890, 2910, 2920, 2940)									14,303	470,446			
Sum of cols. 10 and 11 for all 36 restorative procedures									271,316	\$9,524,059			

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77	AGGREGATE DOLLAR VALUE [(9) X (10)]	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Endodontics													
3310.	Root canal therapy, 1 canal	30	10	10	4	30	10	\$150	5,950	\$ 892,500			
3320.	Root canal therapy, 2 canals	9	2	4	1	8	2	185	1,585	293,225			
3330.	Root canal therapy, 3 canals	18	8	9	3	15	8	250	3,464	866,000			
Sum of cols. 10 and 11 for 3 procedures selected									10,999	\$2,051,725	89.9%	92.6%	79.2%
Sum of cols. 10 and 11 for 16 procedures not selected (3110, 3120, 3130, 3210, 3220, 3340, 3410, 3420, 3430, 3440, 3450, 3460, 3910, 3920, 3930, 3990)									7,943	230,025			
Sum of cols. 10 and 11 for all 19 endodontic procedures									18,942	\$2,281,750			
Periodontics													
4120.	Gingival curettage	147	21	84	19	145	17	\$ 30	21,175	\$ 635,250			
4259.	Osseous surgery	6	0	4	0	6	0	240	1,038	249,120			
4340.	Periodontal scaling and root planing, entire mouth	31	4	12	2	29	4	45	4,614	207,630			
4341.	Periodontal scaling and root planing, less than 12 teeth	48	5	21	3	48	5	25	9,181	229,525			
Sum of cols. 10 and 11 for 4 procedures selected									36,008	\$1,321,525	77.8%	77.4%	84.0%
Sum of cols. 10 and 11 for 17 procedures not selected (4210, 4211, 4260, 4261, 4262, 4270, 4271, 4280, 4310, 4320, 4321, 4330, 4331, 4342, 4350, 4360, 4910)									4,609	378,045			
Sum of cols. 10 and 11 for all 21 periodontal procedures									40,617	\$1,699,570			

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77	AGGREGATE DOLLAR VALUE [(9)×(10)]	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES			
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)	
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Prosthodontics, Removable														
297	5110.....	Denture, full upper	11	0	7	0	10	0	\$350	1,254	\$ 438,900			
	5230.....	Partial denture with gold or chrome lingual bar and 2 clasps, acrylic base	15	0	8	0	13	0	350	1,648	576,800			
	5240.....	Partial denture with gold or chrome lingual bar and 2 clasps, cast base	7	0	4	0	6	0	375	847	317,625			
	5250.....	Partial denture with gold or chrome palatal bar and 2 clasps, acrylic base	10	0	6	0	9	0	350	1,142	399,700			
	5260.....	Partial denture with gold or chrome palatal bar and 2 clasps, cast base	4	0	2	0	4	0	375	535	200,625			
	Sum of cols. 10 and 11 for 5 procedures selected								5,426	\$1,933,650	77.6%	77.6%		
	Sum of cols. 10 and 11 for 39 procedures not selected (5120, 5130, 5140, 5210, 5220, 5280, 5281, 5282, 5290, 5310, 5320, 5410, 5411, 5420, 5421, 5610, 5620, 5630, 5640, 5650, 5660, 5670, 5680, 5690, 5710, 5711, 5720, 5721, 5730, 5731, 5740, 5741, 5750, 5751, 5760, 5761, 5810, 5820, 5830)								5,957	558,352				
	Sum of cols. 10 and 11 for all 44 removable prosthodontic procedures								11,383	\$2,492,002				

NOTE.—Data for removable and fixed prosthodontics reflect the fact that benefits for replacement of partial dentures, abutment crowns, and bridges are limited to once in every five years.

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77	AGGREGATE DOLLAR VALUE [(9)×(10)]	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Prosthodontics, Fixed (Each Abutment and Each Pontic Constitutes a Single Occurrence)													
6230.....	Fixed bridges, tru-pontic	13	0	11	0	11	0	\$194	1,576	\$ 305,744			
6240.....	Fixed bridges, porcelain fused to metal	35	2	29	2	26	1	225	4,167	937,575			
6250.....	Fixed bridges, plastic processed to metal	35	2	22	1	31	1	200	3,774	754,800			
6720.....	Crowns, plastic processed to metal	63	3	42	3	56	2	225	6,965	1,567,125			
6750.....	Crowns, porcelain fused to metal	46	3	26	2	41	3	250	6,292	1,573,000			
Sum of cols. 10 and 11 for 5 procedures selected									22,774	\$5,138,244	96.8%	96.8%	98.4%
Sum of cols. 10 and 11 for 18 procedures not selected (6210, 6220, 6520, 6530, 6540, 6610, 6620, 6630, 6640, 6650, 6710, 6740, 6780, 6790, 6930, 6940, 6950, 6960)									2,523	168,386			
Sum of cols. 10 and 11 for all 23 fixed prosthodontic procedures									25,297	\$5,306,630			

NOTE.—Data for removable and fixed prosthodontics reflect the fact that benefits for replacement of partial dentures, abutment crowns, and bridges are limited to once in every five years.

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77	AGGREGATE DOLLAR VALUE {(9)×(10)}	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Oral Surgery													
7110.....	Simple extraction of single tooth	75	66	27	29	83	78	\$ 25	18,473	\$ 461,825			
7120.....	Simple extraction of each additional tooth	58	38	34	18	69	40	20	13,115	262,300			
7240.....	Surgical extraction of tooth, completely bony impaction	5	8	4	6	5	6	122	1,234	150,548			
Sum of cols. 10 and 11 for 3 procedures selected									32,822	\$ 874,673	72.9%	70.4%	77.3%
Sum of cols. 10 and 11 for 60 procedures not selected (7210, 7220, 7230, 7250, 7260, 7270, 7271, 7272, 7280, 7281, 7290, 7310, 7320, 7330, 7340, 7350, 7410, 7420, 7430, 7431, 7440, 7441, 7450, 7451, 7460, 7461, 7470, 7480, 7490, 7510, 7520, 7530, 7540, 7550, 7610, 7620, 7630, 7640, 7650, 7660, 7670, 7680, 7710, 7721, 7730, 7740, 7750, 7760, 7770, 7810, 7820, 7830, 7840, 7850, 7860, 7870, 7910, 7911, 7912, 7920)									6,274	325,482			
Sum of cols. 10 and 11 for all 63 oral surgery procedures									39,096	\$1,200,155			

APPENDIX I—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER (1)	DESCRIPTION OF PROCEDURE (2)	OCCURRENCES PER 1,000 PER YEAR						AL- LOW- ANCE (9)	NUMBER OF SERVICES FOR ALL GROUPS, INCURRED 7/1/76 TO 6/30/77, PAID THROUGH 12/31/77 (10)	AGGREGATE DOLLAR VALUE {(9)X(10)} (11)	RATIOS OF DOLLAR VALUE FOR SELECTED PROCEDURES TO DOLLAR VALUE FOR ALL PROCEDURES		
		Arithmetic Mean of All Groups		Standard Deviation of the Mean		Weighted Average Mean of All Groups					Adult and Child Combined (12)	Adult Only (13)	Child Only (14)
		Adult (3)	Child (4)	Adult (5)	Child (6)	Adult (7)	Child (8)						
Repair Procedures Other than Oral Surgery—No Procedures Selected													
Sum of cols. 10 and 11 for 11 procedures not selected (7930, 7931, 7940, 7950, 7960, 7970, 7980, 7981, 7982, 7983, 7990)								185	\$ 14,326	0%	0%	0%	
Other Services--No Procedures Selected													
Sum of cols. 10 and 11 for 20 procedures not selected (9110, 9210, 9211, 9212, 9220, 9230, 9310, 9410, 9420, 9430, 9440, 9610, 9620, 9630, 9910, 9920, 9930, 9940, 9950, 9990)								6,505	\$ 89,244	0%	0%	0%	
Sum of cols. 10 and 11 for 44 procedures selected								912,625	\$25,232,737	91.1%			
Sum of cols. 10 and 11 for 229 procedures not selected								59,374	2,466,845	8.9			
Sum of cols. 10 and 11 for all 273 procedures								971,999	\$27,699,582	100.0%			

APPENDIX II
DEVELOPMENT OF CLAIM COSTS FOR DENTAL SERVICES

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR*		ALLOW- ANCE	ANNUAL PURE PREMIUM FOR EACH PROCEDURE		ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child		Adult	Child	Adult	Child
Diagnostic Procedures								
0110.	Oral exam (initial)	204	233	\$ 10	\$ 2.04	\$ 2.33		
0120.	Oral exam (periodic)	129	169	10	1.29	1.69		
0210.	X-rays full mouth	171	125	25	4.28	3.13		
0220.	X-ray first P.A.	141	170	5	0.71	0.85		
0230.	X-ray additional P.A.	245	292	2	0.49	0.58		
0270.	X-ray bitewing, first	147	277	5	0.74	1.39		
0280.	X-ray bitewing, additional	305	490	3	0.92	1.47		
Total					\$ 10.47	\$ 11.44		
Factor A—to account for procedures not selected					0.953	0.973		
Adjusted total							\$ 10.99	\$ 11.76
Preventive Procedures, Other than Restorations								
1110.	Prophylaxis (adult)	390	195	\$ 20	\$ 7.80	\$ 3.90		
1120.	Prophylaxis (child)	0	282	15	0	4.23		
1220.	Stannous fluoride treatment to age 19	0	144	15	0	2.16		
Total					\$ 7.80	\$ 10.29		
Factor A—to account for procedures not selected					0.9999	0.893		
Adjusted total							\$ 7.80	\$ 11.52

NOTE.—The data reflect the following limitations: (1) benefits for procedures 0110, 0120, 1110, 1120 and 1220 are provided not more than twice a year; (2) benefits for procedure 0210 are provided not more than once every three years.

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

APPENDIX II—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR*		ALLOW- ANCE	ANNUAL PURE PREMIUM FOR EACH PROCEDURE		ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child		Adult	Child	Adult	Child
Restorations								
2110.....	Amalgam, primary, silver filling, 1 surface	0	60	\$ 14	\$ 0	\$ 0.84		
2120.....	Amalgam, primary, silver filling, 2 surfaces	0	108	20	0	2.16		
2130.....	Amalgam, primary, silver filling, 3 surfaces	0	18	30	0	0.54		
2140.....	Amalgam, permanent, silver filling, 1 surface	226	413	15	3.39	6.20		
2150.....	Amalgam, permanent, silver filling, 2 surfaces	343	309	24	8.23	7.42		
2160.....	Amalgam, permanent, silver filling, 3 surfaces	142	82	33	4.69	2.71		
2161.....	Amalgam, permanent, silver filling, 4 surfaces	19	10	44	0.84	0.44		
2310.....	Acrylic, plastic filling, 1 surface	230	90	20	4.60	1.80		
2311.....	Acrylic, plastic filling, 2 or more surfaces	26	7	40	1.04	0.28		
2720.....	Crown, plastic with metal	39	6	225	8.78	1.35		
2740.....	Crown, porcelain	9	3	230	2.07	0.69		
2750.....	Crown, porcelain with metal	38	5	250	9.50	1.25		
2790.....	Crown, gold cast	7	1	225	1.58	0.23		
2891.....	Post, crown support	28	5	75	2.10	0.38		
Total					\$ 46.82	\$ 26.29		
Factor A—to account for procedures not selected					0.951	0.949		
Adjusted total							\$ 49.23	\$ 27.70

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

APPENDIX II—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR*		ALLOW- ANCE	ANNUAL PURE PREMIUM FOR EACH PROCEDURE		ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child		Adult	Child	Adult	Child
Endodontics								
3310.....	Root canal therapy, 1 canal	31	10	\$150	\$ 4.65	\$ 1.50		
3320.....	Root canal therapy, 2 canals	9	2	185	1.67	0.37		
3330.....	Root canal therapy, 3 canals	18	8	250	4.50	2.00		
Total					\$ 10.82	\$ 3.87		
Factor A—to account for procedures not selected					0.926	0.792		
Adjusted total							\$ 11.68	\$ 4.89
Periodontics								
4120.....	Gingival curettage	150	21	\$ 30	\$ 4.50	\$ 0.63		
4259.....	Osseous surgery	6	0	240	1.44	0		
4340.....	Periodontal scaling and root planing, entire mouth	32	4	45	1.44	0.18		
4341.....	Periodontal scaling and root planing, less than 12 teeth	49	5	25	1.23	0.13		
Total					\$ 8.61	\$ 0.94		
Factor A—to account for procedures not selected					0.774	0.840		
Adjusted total							\$ 11.12	\$ 1.12

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

APPENDIX II—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR*		ALLOW- ANCE	ANNUAL PURE PREMIUM FOR EACH PROCEDURE		ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child		Adult	Child	Adult	Child
Prosthodontics, Removable								
5110.....	Denture, full upper	11	0	\$350	\$ 3.85	\$ 0		
5230.....	Partial denture with gold or chrome lingual bar +2 clasps, acrylic base	15	0	350	5.25	0		
5240.....	Partial denture with gold or chrome lingual bar +2 clasps, cast base	7	0	375	2.63	0		
5250.....	Partial denture with gold or chrome palatal bar +2 clasps, acrylic base	10	0	350	3.50	0		
5260.....	Partial denture with gold or chrome palatal bar +2 clasps, cast base	4	0	375	1.50	0		
Total					\$ 16.73	\$ 0		
Factor A—to account for procedures not selected					0.776		
Adjusted total							\$ 21.56	\$ 0

304

NOTE.—Data for removable and fixed prosthodontics reflect the fact that benefits for replacement of partial dentures, abutment crowns, and bridges are limited to once in every five years.

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

APPENDIX II—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	OCCURRENCES PER 1,000 PER YEAR*		ALLOW- ANCE	ANNUAL PURE PREMIUM FOR EACH PROCEDURE		ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child		Adult	Child	Adult	Child
Prosthodontics, Fixed (Each Abutment and Each Pontic Constitutes a Single Occurrence)								
6230	Fixed bridges, tru-pontic	13	0	\$194	\$ 2.52	\$ 0		
6240	Fixed bridges, porcelain fused to metal	36	2	225	8.10	0.45		
6250	Fixed bridges, plastic processed to metal	36	2	200	7.20	0.40		
6720	Crowns, plastic processed to metal	64	3	225	14.40	0.68		
6750	Crowns, porcelain fused to metal	47	3	250	11.75	0.75		
Total					\$ 43.97	\$ 2.28		
Factor A—to account for procedures not selected					0.968	0.984		
Adjusted total							\$ 45.42	\$ 2.32
Oral Surgery								
7110	Simple extraction of single tooth	77	68	\$ 25	\$ 1.93	\$ 1.70		
7120	Simple extraction of each additional tooth	59	39	20	1.18	0.78		
7240	Surgical extraction of tooth, completely bony impaction	5	8	122	0.61	0.98		
Total					\$ 3.72	\$ 3.46		
Factor A—to account for procedures not selected					0.704	0.773		
Adjusted total							\$ 5.28	\$ 4.48

NOTE.—Data for removable and fixed prosthodontics reflect the fact that benefits for replacement of partial dentures, abutment crowns, and bridges are limited to once in every five years.

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

APPENDIX II—Continued

AMERICAN DENTAL ASSOCIATION CODE NUMBER	DESCRIPTION OF PROCEDURE	ANNUAL PURE PREMIUM BY CLASS OF PROCEDURES	
		Adult	Child
	Repair Procedures Other than Oral Surgery		
	Adult annual pure premium is 1.1% of oral surgery adult annual pure premium† } Child annual pure premium is 1.3% of oral surgery child annual pure premium† }	\$ 0.06	\$ 0.06
	Other Services (98% of These Dollars Are for Emergency Relief of Pain)‡		
	Adult annual pure premium is 0.93% of adult annual pure premium for restorations } Child annual pure premium is 0.96% of child annual pure premium for restorations }	\$ 0.46	\$ 0.27
	Net annual claim cost, adult/child	\$163.60	\$ 64.12
		Individual	Family
	Net annual claim cost, individual/family§ Net monthly claim cost, individual/family	\$163.60 13.63	\$413.43 34.45

* Occurrences in this appendix are the arithmetic means from Appendix I multiplied by 1.02323, the factor to convert to ultimate incurred claims.

† Percentages are derived from respective adult/child ratios from aggregate dollar payout data.

‡ This is procedure No. 9110. The estimate of the frequency of occurrence for this procedure is 30 per 1,000 per year for adult and 17 per 1,000 per year for child. The allowance is \$15.

§ Family rate = $1.9 \times \text{Individual rate} + 1.6 \times \text{Child rate}$.

APPENDIX III
DISTRIBUTION OF GROUPS AND CERTIFICATES
BY TYPE OF PROGRAM

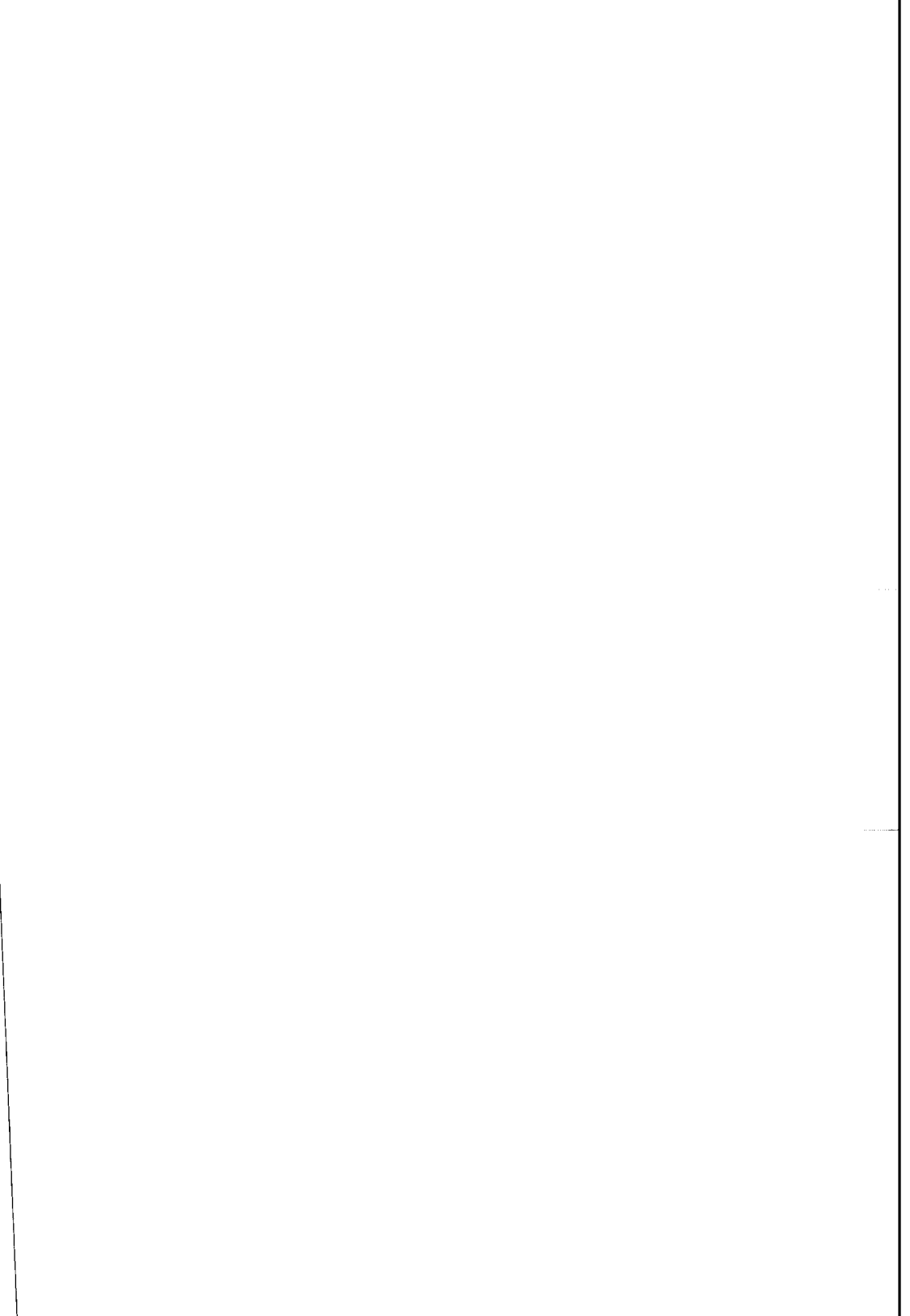
SCOPE OF BENEFITS	LEVEL OF BENEFITS	GROUPS		CERTIFICATES	
		No.	%	No.	%
Comprehensive	100% UCR	2	6 $\frac{2}{3}$ %	3,779	4%
Comprehensive without crowns	100% UCR	1	3 $\frac{1}{3}$	8,053	8
Basic	100% UCR	4	13 $\frac{1}{3}$	11,305	11
Basic plus crowns	100% UCR	1	3 $\frac{1}{3}$	1,723	2
Comprehensive	80% UCR	2	6 $\frac{2}{3}$	6,985	7
Basic	80% UCR	1	3 $\frac{1}{3}$	1,411	1
Comprehensive	Indemnity approximating 50% UCR	9	30	40,559	39
Comprehensive	Indemnity approximating 40% UCR	1	3 $\frac{1}{3}$	2,420	2
Comprehensive	Indemnity approximating 35% UCR	7	23 $\frac{1}{3}$	23,930	23
Basic	Indemnity approximating 50% UCR	2	6 $\frac{2}{3}$	3,035	3
Total		30	100%	103,200	100%

BY SIZE OF DEDUCTIBLE

DEDUCTIBLE	GROUPS		CERTIFICATES	
	No.	%	No.	%
\$0	24	80 %	85,121	83%
\$10	1	3 $\frac{1}{3}$	8,572	8
\$25	3	10	5,779	6
\$50	1	3 $\frac{1}{3}$	2,214	2
\$75	1	3 $\frac{1}{3}$	1,514	1
Total	30	100 %	103,200	100%

NOTES:

1. Comprehensive scope means that all categories of procedures enumerated in Appendixes I and II are covered.
2. Comprehensive without crowns means that all categories of procedures are covered except crowns (procedures 2720, 2740, 2750, 2790, and 2891 in the restorations category).
3. Basic scope means that all enumerated categories of procedures are covered except prosthodontics, removable; prosthodontics, fixed; and crowns (procedures 2720, 2740, 2750, 2790, and 2891 in the restorations category).
4. Basic plus crowns means the basic scope as defined above plus crowns (procedures 2720, 2740, 2750, 2790, and 2891 in the restorations category).
5. For comprehensive programs, the level of benefits indicated is the level under the basic component of the program; the prosthetics component may have either the same or a lower level of benefits. For example, a group with 100% UCR basic and 50% UCR prosthetics is classified as having 100% UCR benefits.
6. As the text of the paper states, there are five different indemnity schedules. Only three different ones appear in this appendix because (a) "indemnity approximating 50% UCR" includes two different indemnity schedules, both of which are close to 50% UCR, and (b) under some of the comprehensive programs, prosthetics are covered with a schedule approximating 25% UCR (the "Level of Benefits" column does not indicate this).



DISCUSSION OF PRECEDING PAPER

JOHN P. COOKSON, JR.:

I was delighted to see at last a paper in the *Transactions* on dental insurance experience. With approximately sixty million people covered by dental insurance at the end of 1978, it is a sad state of affairs that neither the industry nor the Society has, up until this time, published any hard summary of experience on this very important and growing line of business. It is to be hoped that this paper will serve to indicate a "ballpark" level of experience for those without any experience of their own, and will also help stimulate some interest within the Society or the industry in publishing more and better experience statistics. The author points out many of the reservations about the use of this experience. In my opinion it is important to emphasize that these statistics would be inappropriate to use in developing net claim costs and rates.

I do not intend this discussion to derogate the value of this paper, which I feel is a significant first step for the industry and the Society. A great deal of hard work can be recognized in the paper, and the author is to be commended on his presentation.

My strong reservations about the use of these data for rating purposes stem from their lack of homogeneity. Experience that we have observed indicates substantial utilization differences by socioeconomic group and also by richness of benefits. Since the experience presented in the paper pools the utilization levels of (presumably) all socioeconomic groups and also pools the experience of many different benefit levels (differing in both scope and richness), the differences are all hidden in the aggregate statistics.

Some of the basic problems that preclude the use of the published statistics for rating purposes are summarized below:

1. First- and/or second-year claim costs are substantially (10-40 percent) higher than those of subsequent years, and manual rates properly should reflect this difference. Transferred business analysis or percentage reductions for mature experience can be developed to be competitive on mature business. Since the experience developed in the paper represents primarily mature experience, the utilization levels developed will understate the expected experience for the first year or first two-year rating period to the extent of the difference between initial usage levels and mature usage levels.
2. Because of the mix of benefit levels of the different groups included in the experience base, the utilization levels of many procedures will be distorted.

For example, the groups with basic coverage only presumably would have no utilization for prosthodontics and, therefore, their exposures should have been eliminated in determining the frequency level for these procedures. Also, the effect of the deductibles in some groups' benefits probably will be to understate frequencies of some of the low-cost, high-incidence procedures such as oral exams, prophylaxis, X-rays, and so forth.

3. As mentioned by the author, the mix of coinsurance levels will have an effect on the utilization levels of various services. This is particularly true for prosthodontic services. We have observed a utilization rate for prosthodontics with 100 percent coinsurance equal to approximately three times that for prosthodontics with 50 percent coinsurance.
4. The fact that the experience is representative of a single urban area, New York City, may make it inappropriate for many other areas of the country, because of differences in patterns of dental care, distribution of dentists, and awareness and use of dental services.
5. Many dental insurance programs in the marketplace currently provide the features of predetermination and alternate courses of treatment provision. The predetermination clause provides that for claims of \$100 or more a treatment plan is to be submitted by the dentist prior to inception of treatment. The carrier will then determine its liability and advise the patient and dentist as to the amounts payable under the program. Under the alternate-courses-of-treatment provision, the carrier will determine its liability based on the lowest-cost treatment that is professionally acceptable. In many instances the carrier will pay for removable prosthetic devices rather than the more expensive fixed prosthetic appliances. The experience in this paper shows much higher utilization for fixed bridgework and lower utilization for removable dentures than would be expected. This could be the result of the predetermination procedure of New York Blue Cross and Blue Shield, the socioeconomic groups involved, the duration of experience, or the patterns of care in this limited geographic area. It would be very informative to learn the approach to predetermination and alternate courses of treatment (if any) applied by New York Blue Cross and Blue Shield.
6. One minor point regarding the adult and child composition of the group concerns the possible claims under student rider extensions for children at ages 20-23. Since all claims at ages 20 and over were considered adult claims, they would then be built into the adult frequencies, and would tend to overstate somewhat the adult-only rate and to understate the child rate.

I hope this paper will stimulate more discussion within the Society and the industry on the various aspects of this most interesting topic.

SIMONE MATTEODO, JR.:

Mr. Ullman deserves the thanks of all group health actuaries for the important contribution he has made to the actuarial literature on this timely subject. He has reviewed a very substantial amount of experience

and presented it in a very logical manner. I feel confident that actuaries will make considerable use of this paper in understanding, designing, and pricing the dental benefit. My comments are brief and are as follows.

Reference is made in the paper to excess claim experience in the first year of the dental plan. I realize that such experience is difficult to procure, but I believe its inclusion would enhance the paper.

The experience that Mr. Ullman reviewed reflects the demographic patterns, the nature of dental practice, and dental conditions in and around the greater New York area. For most companies that do a nationwide business, it would be very useful to have this kind of information for different areas.

With regard to the net claim costs furnished by Mr. Ullman, these data, although quite useful, are very limited in their applicability to establishing premium rates in the future. Although there is some likelihood, probably small, that utilization patterns may change as time passes, a greater concern is changes in the level of charges and benefits. It would be helpful if the author would furnish some opinion as to the rate of change of cost with the passage of time, in order that actuaries could make more use of the paper in establishing premium rates for the future.

Mr. Ullman refers to the fact that not all groups had all benefits; more particularly, a significant portion of the coverage did not include crowns. I assume that some adjustment has been made to the exposure base so that references to "occurrences per thousand per year" reflect the appropriate reduced exposure.

Finally, Appendix I indicates that the aggregate dollar value, column 11, is the product of an "allowance" in column 9 and the number of services, column 10. This sort of actuarial valuation presumes that the "allowance" is paid as a benefit in each instance. Most plans may contain such an allowance, but the allowance would be the maximum payable under "usual and customary" plans, with the average value for a given procedure to be somewhat less than such an allowance. This difference between allowance and average value is very important for premium rate purposes because, typically, the average payment (which is less than the allowance) is the liability basis for premium rates. I would appreciate a better explanation from the author of how the allowance applies in the plans the author reviewed and what relationship the average value has to the allowance, as well as the variation by procedure of average benefit and allowance. In particular, are the "annual pure premiums" in Appendix II based on "allowance" or on "average benefit"? I believe the latter to be more appropriate.

(AUTHOR'S REVIEW OF DISCUSSION)

RICHARD E. ULLMAN:

I wish to thank Messrs. Cookson and Matteodo for their efforts in reviewing my paper and setting forth their comments.

The general tenor of the remarks, particularly those of Mr. Cookson, is that the heterogeneous nature of the experience precludes its being used as the basis for developing net claim costs and rates. In order to reply to this observation, I should like to give a brief description of the genesis of this paper.

Having been in the business of group dental expense insurance for some few years, with a significant block of mature and credible experience and the ability to capture such experience with the use of electronic data processing equipment, we at Blue Cross and Blue Shield of Greater New York undertook, in the spring of 1977, the compilation of data that formed the basis of this paper. We recognized the difficulties in compiling dental experience data from thirty different groups with widely differing benefits and demographic characteristics; nevertheless, the size of the data base led us to believe that results of significant value could be obtained.

When, after having gone through the process described in the paper (generating net claim costs using the frequencies set forth and adjusting these costs using adjustment factors relating to plan design and demographic characteristics), we obtained net claim costs that quite closely reproduced the actual net claim costs that we were experiencing, we believed that the data contained in the paper were suitable for our own use and would be of value to the industry as a whole. Of course, it would have been desirable to test these adjustments against actual experience. This was not practical, however, because of the loss in statistical credibility as finer and finer units of experience are analyzed. The question of whether or not the results are suitable for use in developing a dental rate manual was answered not by armchair considerations but on the basis that we did actually develop a dental rate manual and it worked. The approach used, therefore, was pragmatic and empirical throughout.

Mr. Matteodo would like to see excess first-year experience, and Mr. Cookson mentioned that since the paper represents primarily mature experience the utilization levels developed in the paper will understate expected experience for the first year or for the first two-year rate period. Mr. Cookson is right. Most of the experience in the paper is mature, therefore this experience would not be of much, if any, use in determining excess first-year cost. The rates developed in the paper may be used

for mature net claim costs and loaded appropriately, perhaps 10–40 percent as suggested by Mr. Cookson. One approach is to use a load on the low end of this interval and guarantee the rate for two years, thereby offsetting first-year losses by second-year gains.

Certainly, the mature experience of the paper does not preclude the use of the resulting frequencies as the basis for developing net claim costs and rates. I realize that the experience in the paper cannot be used without adjustment to develop net claim costs, and the paper certainly implies that adjustments are necessary. However, before one can make adjustments, one must have something to start with, namely, a set of frequencies for a substantial segment of dental procedures. Our company undertook this study in order to obtain such a set of frequencies, and, after the results worked for our own dental rating manual, we decided to disseminate them to the actuarial community at large for similar use.

Mr. Matteodo comments that not all groups had all benefits, and he assumes that some adjustment has been made to the exposure base so that references to “occurrences per thousand per year” reflect the appropriate reduced exposure. Mr. Cookson comments that “groups with basic coverage only presumably would have no utilization for prosthodontics and, therefore, their exposures should have been eliminated in determining frequency levels for these procedures.”

In all cases, occurrences in the numerator and exposure in the denominator are on a consistent basis. For groups that did not have prosthodontic coverage during the three-year exposure period, no amount was included in the exposure denominator. In fact, separate exposures were developed for each of the forty-four procedures for each of the three years of coverage. Also, special exposures excluding dependents were developed for groups under which prosthetic coverage is for employees only.

Mr. Cookson is concerned with the effect of deductibles on low-cost, high-incidence procedures such as oral exams, prophylaxis, and X-rays. I agree that the presence of deductibles will act to decrease utilization of these procedures. In order to measure the effect of the deductible, I have recalculated the frequencies of ten low-cost procedures using data from the twenty-four groups that have zero deductible. Table 1 of this discussion shows the results of this recalculation. On the average, the utilization of these procedures is about 5 percent higher when the deductible groups are excluded.

For prosthodontic services, Mr. Cookson says, “We have observed a utilization rate for prosthodontics with 100 percent coinsurance equal to approximately three times that for prosthodontics with 50 percent co-

insurance." Our experience, shown in Table 2 of this discussion, does not indicate this kind of a difference. I have broken down the prosthodontics experience between groups with 80-100 percent "usual, customary, and reasonable" (UCR) coverage and groups with indemnity programs paying 35-50 percent of UCR. For removable prosthodontics the utilization on the indemnity contract is 28 percent lower than on UCR contracts. However, for fixed prosthodontics the utilization of indemnity contracts is 5 percent higher than for UCR contracts.

I certainly agree with the observations of both discussants that the dental experience observed in New York City, Long Island, and ten other contiguous upstate New York counties is not necessarily appropriate for other areas of the country. Nevertheless, I do believe that actuaries making rates for other areas can avail themselves of the frequencies in the paper and use appropriate adjustment factors to adjust

TABLE 1

AMERICAN DENTAL ASSOCIATION CODE NUMBER	OCCURRENCES PER 1,000 PER YEAR				ALLOWANCE
	All Groups in Appendix II		Excluding Six Groups with Deductible		
	Adult	Child	Adult	Child	
Diagnostic procedure:					
0110.....	204	233	213	246	10
0120.....	129	169	141	183	10
0210.....	171	125	184	134	25
0220.....	141	170	145	178	5
0230.....	245	292	253	306	2
0270.....	147	277	151	288	5
0280.....	305	490	313	511	3
Annual net claim cost.....	\$10.99	\$11.76	\$11.61	\$12.45
Increase due to removing de- ductible groups.....			5.6%	5.9%
Preventive procedures other than restoration:					
1110.....	390	195	404	196	20
1120.....	0	282	0	300	15
1220.....	0	144	0	161	15
Annual net claim cost.....	\$7.80	\$11.52	\$8.08	\$12.13
Increase due to removing de- ductible groups.....			3.6%	5.3%

for differences in the number of dentists on a per capita basis and the level of awareness concerning dental care. Of course, it would be preferable to obtain experience from the area being rated. I join the discussants in inviting other dental carriers to publish their experience.

Mr. Cookson's fifth point, regarding predetermination, is an interesting one. The concept of predetermination of benefits is based primarily upon the electivity of certain dental services. Because of this electivity an alternate-course-of-treatment provision has been used by commercial

TABLE 2

AMERICAN DENTAL ASSOCIATION CODE NUMBER	OCCURRENCES PER 1,000 PER YEAR—ADULTS ONLY			
	In Appendix II	Five UCR Groups	Seventeen Indemnity Groups	Allowance
Prostodontics, removable:				
5110	11	15	9	\$350
5230	15	18	14	350
5240	7	10	6	375
5250	10	12	10	350
5260	4	5	4	375
Annual net claim cost.....	\$21.56	\$27.55	\$19.72
Percentage below UCR cost..	21.7%	0%	28.4%
Prostodontics, fixed:				
6230	13	10	14	\$194
6240	36	38	34	225
6250	36	31	38	200
6720	64	49	70	225
6750	47	56	44	250
Annual net claim cost.....	\$45.42	\$43.09	\$46.19
Percentage above UCR cost..	5.4%	0%	7.2%

carriers. However, this provision has an impact upon the professional judgment of the dentist, since it implies that the lowest-cost dental treatment that is functionally acceptable is conducive toward good oral health. This is not necessarily true.

To illustrate, if an insured needs, say, two adjacent artificial teeth to replace missing natural teeth, we will pay for either fixed or removable prostheses depending upon which is the more suitable treatment. The commercial carriers, on the other hand, will pay automatically only for the less costly treatment, that is, removable dentures.

There is one instance in which we will not pay for fixed bridgework. If an insured already has a removable denture and he loses additional teeth in the same arch (upper or lower), we will pay only for a removable

denture for that arch—we will not pay for fixed bridgework. In short, our contract provides for the replacement of all the missing teeth in an arch with fixed or removable prostheses but not for both. This limitation is consistent with both acceptable dental practice and cost-effectiveness of a dental care program.

Because our precertification policy does not have an impact upon the dentist's professional judgment as the policy of the commercial carriers does, it is possible that this is part of the reason for what Mr. Cookson says is our "higher utilization for fixed bridgework and lower utilization for removable dentures than would be expected." Additionally, it is quite possible that geography and the socioeconomic level of the groups involved have a bearing on the higher utilization of fixed prosthetics.

As to Mr. Cookson's last point, he is correct in saying that adult exposures are understated because of the existence of riders covering all dependent children up to age 23 and riders covering only college children up to age 23. Six of the thirty groups have dependent-children riders, and five of the thirty groups have college student riders to age 23. I have estimated the overall effect on adult exposure to be a 3.7 percent understatement; therefore, it would be appropriate to divide all adult frequencies by 1.037. For the child frequencies, there would be a concurrent increase of 6.2 percent.

I do not agree with Mr. Matteodo's third point that the data are quite limited in their applicability to establishing premium rates for the future. The origin of this thought is the assumption that the levels of charges or allowances shown are a significant part of the paper. This is not true. By far the greater part of the work in preparation of the paper was the calculation of utilization rates by procedure for adult and child. The allowances shown represent usual, customary, and reasonable dental fees in 1977 and 1978 in the New York area. These allowances were put in Appendix II in order to give some idea of the relative cost of each category of procedures. In using the utilization rates in the paper to calculate dental claim costs, it is expected that each carrier will use either its own scheduled amounts or usual, customary, and reasonable amounts that will reflect appropriately the period of time and the geographical area for which claim costs are being made. The allowances used in the paper are not meant to be used as a tool for calculating the claim costs of carriers other than the author's own company. It is, of course, reasonable to believe that, barring technical changes in dental practice, the relationship of these allowances to one another will hold fairly well in all time periods and all geographical areas, and it may indeed be possible to develop an indemnity schedule in accordance with these allowances.

However, it is not intended that they be made use of in establishing premium rates by other carriers. It is only the utilization rates that may be used for this purpose.

One other point is worth mentioning here. The allowances that I speak of are, as stated heretofore, average charges of dentists and not really allowances in the sense that they come from a fixed indemnity schedule. Perhaps, the term *allowance* was not a good one. Nevertheless, it is to be hoped that the clarifications contained herein will enable the data presented in this paper to be used for what the author intended, namely, utilization rates of dental services.

Mr. Matteodo's last point as to "allowances" is a related item. To reiterate, amounts stated as "allowances" are not really allowances. Instead, they are the average benefits paid under a dental program covering 100 percent of usual, customary, and reasonable charges.

