

TRANSACTIONS

MARCH, 1955

GROSS PREMIUMS FOR INDIVIDUAL AND FAMILY MAJOR MEDICAL EXPENSE INSURANCE

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AS OF January 1, 1954, the Equitable announced the availability of a new major medical expense policy for individuals and families, which replaced for new business issues a more limited form offered by the Society since August 1951. This actuarial note is presented in order to put into the record the anticipated claim costs for this policy and some detail with regard to the calculation of the gross premiums.

DESCRIPTION OF THE POLICY

Briefly, the policy provides that if, in connection with an accident or sickness, hospital or medical expenses are incurred on behalf of an insured person which exceed \$500 within a 60-day period, benefits commence and will be equal to 75% of the charges in excess of the deductible amount of \$500. Once begun, benefits are payable at the rate of 75% of the expenses incurred by the claimant for that accident or sickness during the remainder of the one year period starting with the beginning of the 60-day qualifying period. Further, if the claimant is confined to a hospital at the expiration of the year, benefits continue to be payable at the 75% rate during the additional period for which he is continuously confined to the hospital.

After the expiration of the year's period or the extension thereof during a continuous period of hospital confinement, additional benefits may be payable with respect to the same accident or sickness if expenses again exceed \$500 within a new 60-day period, provided the maximum benefit has not been exhausted. The maximum benefit is \$7,500 with respect to each insured person in relation to any one accident or sickness, all recurrences and related conditions. The payment of the maximum amount with regard to one cause does not preclude recovery from another unrelated condition.

In the event of a common accident as a result of which expenses are incurred with respect to more than one insured family member, all expenses are combined in determining the beginning of the 60-day qualifying peri-

od for each insured person and only one deductible amount of \$500 is applied.¹

Reimbursible expenses are limited to the regular and customary charges for services, supplies, and treatment furnished, to the extent prescribed as necessary by the attending physician, but include expenses incurred at home or in the doctor's office as well as in the hospital. Substantially all types of charges by physicians or surgeons, by hospitals for room and board and other services, for private duty nursing and for other medical services or supplies come within the scope of the policy.

While normal maternity cases are excluded from coverage, benefits are provided for complications incident to pregnancy; in such cases, expenses which would normally have been incurred are excluded and the benefit formula, including the deductible amount of \$500, is applied to the remaining expenses. Other policy limitations are for expenses incurred: in a federal hospital; as a result of war; for a member of the armed forces; for nervous and mental diseases; for Workmen's Compensation cases; for dentistry or dental X-rays, except as required because of accidental injury of sound natural teeth; for cosmetic surgery, unless occasioned by accidental injury or by a congenital anomaly in a child born while the policy is in force; for eye refractions, eye glasses or the fitting thereof; for hearing aids or the fitting thereof; and for transportation, except local ambulance service.

The application for the policy is a nonmedical health questionnaire, completed by the insured for himself and, if he has a family, with respect to his spouse and eligible children. The policy is issued to adults through age 60 nearest birthday and children are eligible under a family policy if unmarried and under age 18. Subject to the renewal provision, the coverage of adults may be continued to the premium due date following the 65th birthday. New-born children are insured automatically from birth; the amount of the premium is increased on the next premium due date following the date of birth of the first child. While the consent of the insurance company is required for the renewal of the policy, the contract provides that renewal will not be refused solely on the basis of a change in the physical condition of any person after becoming insured.

For adults, separate premiums for males and females vary according to issue age nearest birthday. The premium for the coverage of a child or children is added to the premium for the adults and is the same regardless of the number of children insured. The right to change the premium rates

¹ For California, it was necessary to devise a special policy with different premiums, in which the requirement of hospital confinement was substituted for the 60-day qualifying period.

is reserved to the insurance company, but is intended to be exercised only in relation to a class of policies.

GROSS PREMIUMS

The cost of major medical expense insurance is surrounded by a wide area of uncertainty. There are few available statistics. In addition, it is hard to know how much the spread of coverage of this type may affect present medical and hospital costs, what inflation of cost levels there may be as a result of changes in economic conditions, or how future advances in medical practice may influence costs. With these general considerations in mind, we attempted to compute premiums on a conservative basis that we might reasonably expect to maintain for a significant period of years.

The level premium approach was adopted in connection with premiums for adults because of the importance of the variation in costs by age. Barring a modification in the scale of premium rates, the premiums are computed so as to remain constant from issue until a change in family status, termination, or expiry at age 65 occurs. We plan to hold the excess funds paid in the early policy years in the form of reserves to cover the increased claim costs anticipated at the later durations and older ages.

The following describes the factors in the premium calculation.

- a) *Morbidity.* The basic claim level was established from experience under our predecessor major medical expense policy during 1951, 1952 and 1953. There were about 20,000 life years of exposure on adults and 6,000 years exposure on child or children units. The average claim costs experienced were adjusted to reflect the increase in scope of benefits under the new policy and to include morbidity margins of about 20%. Approximately an equal volume of data contained in Alan M. Thaler's paper "Group Major Medical Expense Insurance," *TSA* III, 429, was used to assist in the determination of the variation by age in claim costs for adults. The net annual claim costs for males and females are set forth in Table 1, where S_x is the average amount of benefit expected to be paid in the year of age from x to $x + 1$. It was found that S_x could be expressed in Gompertz' form, bc^x , with a consequent simplification of the calculations. The values of the constants are $b = 3.2846$, $c = 1.034$ for males, and $b = 6.1578$, $c = 1.027$ for females. The annual claim cost for the coverage of one or more children under family policies was taken as \$11.00. In our experience, the average family policy included 2.2 children.
- b) *Termination Rates.* Allowance was made directly in the premium calculation for terminations from all causes including lapse, death, expiry and nonrenewal by the insurance company. First and second policy year experience under our predecessor policy indicated that an over-all policy termination rate of 30% would be conservative for the first year and 15% for the second year. These rates were extended somewhat arbitrarily for subsequent years as follows: 10% in the third year, 8% for the next 11 years, and 3% thereafter.

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For simplicity and in the absence of other information, terminations were assumed to depend on policy duration only. A survivorship table, l_t , was calculated from these termination rates.

- c) *Expenses.* Claims expenses were expressed as a percentage of the claim cost. Other expenses were translated into a constant per policy and a percentage of premiums, separately for the first policy year and for succeeding years. The percentage expenses take into consideration a commission scale, which is 40% first year, 20% second year, 10% third to tenth years, and 2% service fees thereafter. Premiums involving both the constant and percentage expenses were computed for males and females for use where the individual was the only adult covered under the policy. A separate set of premiums was computed for females, including the percentage expenses but not the con-

TABLE 1
INDIVIDUAL AND FAMILY MAJOR MEDICAL EXPENSE INSURANCE
75% BENEFIT IN EXCESS OF \$500 DEDUCTIBLE
WITH \$7,500 MAXIMUM BENEFIT

AGE	S _x , ANNUAL CLAIM COST IN THE YEAR OF AGE x TO x+1		AGE	S _x , ANNUAL CLAIM COST IN THE YEAR OF AGE x TO x+1	
	Male	Female		Male	Female
21.....	\$ 6.63	\$10.77	46.....	\$15.29	\$20.97
22.....	6.86	11.06	47.....	15.81	21.54
23.....	7.09	11.36	48.....	16.35	22.12
24.....	7.33	11.67	49.....	16.91	22.72
25.....	7.58	11.98	50.....	17.48	23.33
26.....	7.84	12.31	51.....	18.08	23.96
27.....	8.10	12.64	52.....	18.69	24.61
28.....	8.38	12.98	53.....	19.33	25.27
29.....	8.66	13.33	54.....	19.98	25.95
30.....	8.96	13.69	55.....	20.66	26.65
31.....	9.26	14.06	56.....	21.36	27.37
32.....	9.58	14.44	57.....	22.09	28.11
33.....	9.90	14.83	58.....	22.84	28.87
34.....	10.24	15.23	59.....	23.62	29.65
35.....	10.59	15.64	60.....	24.42	30.45
36.....	10.95	16.07	61.....	25.25	31.27
37.....	11.32	16.50	62.....	26.11	32.11
38.....	11.70	16.95	63.....	27.00	32.98
39.....	12.10	17.40	64.....	27.92	33.87
40.....	12.51	17.87	65.....	28.87	34.79
41.....	12.94	18.36			
42.....	13.38	18.85			
43.....	13.83	19.36			
44.....	14.30	19.88			
45.....	14.79	20.42			

stant expenses, for use in connection with the coverage of a wife under a policy issued to her husband, the combined premium for husband and wife being the sum of the premiums appropriate to the age of each. The premium for children under a family policy to be added to the premium otherwise determined for adults was also computed without the constant expenses. By these means, the premium for a policy covering more than one person provides for the constant policy expenses only once.

- d) *Dividends and Contingencies.* The policy is intended to be participating. However, dividends are not expected to be payable for the first few years. Provision was made in the premium calculation for a combined margin for dividends and general contingencies of $7\frac{1}{2}\%$ of premium during the first three policy years and $22\frac{1}{2}\%$ of premium thereafter. The provision of these margins was not intended to establish either the amount or the pattern of any dividends that might become payable.
- e) *Interest.* A rate of $2\frac{1}{2}\%$ per annum was assumed.