

effort in the search for more accurate classification systems, not only in private passenger automobile insurance but in other lines as well, as Mr. Pruitt pointed out so forcefully last November in his presidential address, "St. Vitus's Dance". The negative binomial distribution, which has also been called the "accident proneness" distribution, provides a valuable tool for that search.

THE ACTUARIAL ASPECTS OF BLUE CROSS PLANS

BY

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DISCUSSION BY M. KORMES

The paper submitted by Mr. Faust describes one rate making technique and it creates the impression that the problem is a rather simple one. This may be the case where the contract benefits are more or less uniform, i.e., where there is only one coverage for group contracts and only one coverage for non-group contracts.

There exists, however, in many Blue Cross plans a multiplicity of contracts which may range from full semi-private coverage to an allowance of \$7.00 (or even less depending on the area served) for Room and Board. The ancillary (all other hospital expenses) benefits may be covered in full or there may be some exclusions or monetary limits on certain benefits (such as X-Rays and laboratory or blood plasma). Maternity Coverage may be in full or limited to a fixed amount for regular delivery or all obstetrical admissions. Allowances for private accommodations may vary from group to group. Out-patient benefits may be provided in full or in part or only accident emergency within twenty-four hours. Co-insurance in the form of a flat percentage on all or part of benefits or in the form of various deductibles is used by many plans. In fact, the multiplicity of coverage is so great that the coding of the coverages becomes a serious problem, especially as it is necessary for the member hospitals to know the coverage granted to any subscriber upon admission.

In the introduction the author states that for the plan which serves as a statistical basis of his paper the Underwriting Gain is from 3.5% to 4.0% of Gross Income. As a rule Blue Cross plans have a provision in the rates for additions to the Statutory Surplus (as required by the Insurance Department having jurisdiction) of 3.0% to 5.0% of the rates so that only after these amounts are realized after losses and expenses is there a real Underwriting Gain. Since with a few exceptions the Statutory Surplus of the plans is considerably below the required amount there are very few plans having a real Underwriting Gain.

The rate making process described by Mr. Faust is based on the loss ratio method, first by determining the adjustment for the current level of cost, and then projecting to a future level by graphical extrapolation.

As respects his loss development method, it should be pointed out that the percentages depend on the promptness of reporting discharges by the hos-

pitals, the promptness with which the claims are processed and paid by the plan, as well as the most prevalent durations of contract coverage. Thus, for a plan with a coverage of 120 days and an annual loss volume of over \$69,000,000, the percentages are as follows:

Month of Period	Per Cent of Ultimate Incurred Losses Represented by Payments to End of Month
1st	.83%
2nd	6.33
3rd	13.68
4th	21.63
5th	29.75
6th	37.96
7th	46.23
8th	54.52
9th	62.81
10th	71.11
11th	79.42
12th	87.73

The estimates of ultimate incurred losses made on the basis of loss payment patterns are extremely accurate and the error of the first estimate seldom exceeds 2% and is usually an overestimate. The value of this method for other casualty losses should be given further study as the papers by Mr. Tapley⁽¹⁾ and Mr. Harwayne⁽²⁾ indicate that there is a functional relationship between the losses paid at the end of a given period and the ultimate losses incurred.

The rate making as such is much more refined in many plans than that described by Mr. Faust.

For the plans with which the writer is connected the procedure may be briefly described as follows:

- (a) Fiscal or calendar year experience for three or four consecutive years is studied to determine the trend of incidence of in-patient days per contract month for each class of contracts and each major coverage. Where there appears to be a definite trend, a projection is made by the method of least squares (straight line or parabola). Where there is no particular trend, an average of the last two years is usually taken but judgment is exercised in this connection.
- (b) The per-diem hospital payments are also studied separately by class of contract and by coverage (there is a great deal of variation) and here also a projection is made taking into consideration the fixed and the variable portions and contractual arrangements with hospitals.
- (c) The values of (a) and (b) projected to the midpoint of the period during which the rates would be applicable are multiplied to obtain the in-patient pure premiums.
- (d) Separate projection is made for out-patient pure premiums calculated

⁽¹⁾CAS XLIII, p. 166.

⁽²⁾CAS XLV, p. 63.

for each of the years of the experience period and each class of contract.

- (e) The total pure premiums are then loaded for expenses and additions to Statutory Surplus.

The rates are usually calculated to be sufficient for a period of two or three years and so far the above method has produced extremely satisfactory results.

No discussion of rate making would be complete without a consideration of merit rating plans. While it is true that the majority of Blue Cross plans frown on merit rating as being contrary to the community principles of Blue Cross, several large plans felt that one cannot exist in an abstraction and must prevent the loss of good risks to keen competition. Thus, there have been developed merit rating plans embracing prospective, retrospective and cost-plus features and recognizing gradation of expenses by size of risk. The prospective merit rating plans have a built-in feature of cost projection to the level of the period during which the rates will apply and, in view of the fact that a substantial percentage of the business is merit-rated, have postponed the necessity of general rate revisions in many instances for one or more years.

I do not wish to dwell on the author's analysis of Blue Cross rates or the comparison of costs with that of insurance companies for the following reasons:

1. It is not sound to charge premium rates by age or by the sex distribution of the employees in a group. Any inherent differences are taken care of by the merit rating for larger groups and uniform rates for smaller groups are more desirable from the public relations point of view.
2. A true comparison of costs with those of insurance companies could only be made if the coverages were identical and then the comparison should be made on the basis of the incidence of in-patient days per contract.
3. The results are based on 63,960 contracts and this number subdivided by single males, single females, married males and married females as well as by sex and age groups gives rather thin exposure for some if not all of the subdivisions (2,665 contracts on the average). In fact, as a member of a committee working under the auspices of the Blue Cross Commission, I have participated in a study embracing fourteen Blue Cross plans from areas representative of the entire United States. This study predicated on over 3,400,000 contracts and over 3,850,000 in-patient days showed that the utilization differential for those over 65 as compared with those under 65 is 3.79 for males and 2.17 for females. The results in Mr. Faust's paper seem to indicate identical cost for both sexes in the over 65 bracket and approximately the same average cost for all ages up to 65 combined.

In conclusion, I would like to say that in the development of its rating techniques the Blue Cross plans have leaned heavily on the methods used in casualty insurance business and when some of the refinements have been proved by the test of time they may well be a worth while subject of a paper to be submitted to the Society.