



SOCIETY OF ACTUARIES

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TO BE CONTINUED

Editor's Note: In this issue we present the first article in the series of articles from the Committee on Continuing Education. The rule is one article to one subject to give the non-specialist in that subject up-to-date general information and to encourage further research in the subject if the reader is so minded. Comments will be welcomed by the Committee and the Editor.

Actuarial Aspects of HMOs

by John G. Turner

Insurers are becoming increasingly involved in the development and marketing of prepaid health care service plans, or Health Maintenance Organizations (HMOs) as they are officially termed by the HEW. Evidence of this interest was exhibited in September 1972, when representatives of about 200 insurance companies attended the first HIAA Conference on HMOs in Chicago.

Involvement with HMOs gives actuaries an opportunity for using some novel methods for determination of capitation rates for the services provided (in capitation rate is the premium). Such methods are necessary because there is a startling lack of valid data on utilization rates of hospital and medical care services in an HMO environment, and the HMO is organized around the services of a group of physicians, and each physician group has a different pattern of practice and organization of specialties.

It is necessary for the actuary to apply some unusual calculation methods to overcome the uncertainties resulting from the two problems mentioned above. Harry Sutton, involved with HMO developments for some time, has developed four approaches to HMO capitation determination.

Social Security Notes

A. Rettig and O. Nichols, *Some Mathematical Aspects of the Social Security Amendments in Public Law 92-603*, Actuarial Note No. 80, January 1973, Social Security Administration, Washington, D. C., pp. 18.

This Actuarial Note discusses some of the features of the Social Security Amendments of 1972. It presents tables showing illustrative monthly benefits and a Fortran V computer program for reproducing the exact primary insurance amounts in the benefit table.

Free copies available from Soc. Sec. Admin.

I. Integrated Budgeting Approach:
We first identify the total operating costs of the HMO organization providing hospital and medical services to the enrolled group of subscribers. These costs

are then allocated to the subscriber population on a unit basis. The table below shows, in an over-simplified manner using figures which are rough estimates, the elements of this method.

Direct Annual Expenses of Medical Group

Physician Salaries and Fringe Benefits.....	\$200,000
Non-Physician Salaries and Fringe Benefits.....	150,000
Supplies	50,000
Building and Occupancy	50,000
Depreciation	20,000
Amortization of Start-Up Costs	25,000
Total-Direct Expenses	\$495,000
Annual Expenses Based on Utilization of Plan Services	
Hospitalization	\$300,000
Out-of-Area Benefits	25,000
Total Utilization	\$325,000

Calculation of Subscriber Cost

Total Operating Expenses	\$820,000
Number of Subscribers	5,000
Monthly Cost per Subscriber	\$13.67

It should be noted that, among other things, the foregoing analysis omits coverage of outpatient drugs and provides for no marketing or distribution costs.

II. Inventory Approach: Here we determine the total health care expenditures, by type of service, of an identifiable community; then these expenditures are allocated on a per capita basis. The per capita expenditures are then analyzed in terms of the specific health care

services to be provided by the HMO.

The table below illustrates this method, using estimated per capita personal health care expenditures for 1971 based on data from the Bureau of the Census for the U.S. Population. The actual data relate to adults ages 19 to 64.

<i>Type of Expenditure</i>	<i>Total Cost</i>	<i>Not Covered by HMO</i>	<i>HMO Service</i>
Hospital	\$158.00	\$ 19.00	\$139.00
Physicians' Services	69.00	2.00	67.00
Dentists' Services	27.00	25.00	2.00
Other Professionals	8.00	0.00	8.00
Drugs and Drug Sundries.....	37.00	37.00	0.00
Eyeglasses and Appliances	10.00	10.00	0.00
Nursing — Home Care	2.00	2.00	0.00
Other Health Services	12.00	6.00	6.00
	<u>\$323.00</u>	<u>\$101.00</u>	<u>\$222.00</u>

Average Monthly Capitation \$ 18.50

This method is very difficult to apply in a specific situation, and probably should be used only as reference for comparison with results of other methods.

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HMO'S*(Continued from page 3)*

III. *Group Insurance Rating Approach:* Under this approach, each of the services provided under the HMO "benefit package" would be analyzed and rated, using the age, sex, and income characteristics of an assumed enrolled population, following standard group health insurance techniques.

In theory, this may be a sound approach, but there are several types of HMO medical services for which insurance companies do not have experience data. In addition, the pattern of utilization of medical care services under an HMO may differ from utilization rates

Age Group	Assumed Enrollment		Annual Rate per Subscriber		Physician Encounter (Non-Surgical)
	Male	Female	Hospital Days Male	Hospital Days Female	
Under 30	500	400	.375	.600	4.100
30 - 39	350	350	.375	.560	4.400
40 - 49	150	150	.530	.720	5.300
50 - 54	120	120	.700	.900	6.100
55 - 59	100	100	.950	1.100	7.400
60 - 64	100	80	1.200	1.400	8.800
Average Rate of Utilization			.528	.728	5.114
Average Cost Per Use			\$ 93	\$ 102	\$15.00
Monthly Capitation for Indicated Service			\$4.09	\$ 6.19	\$6.39

The assumed hospital utilization rates in this table were developed starting with data from the Society of Actuaries 1969 *Reports* for group hospital experience, in conjunction with physician estimates of the degree to which hospital utilization could be controlled in a specific HMO environment. The rates of physician encounter were based on a study by the American Rehabilitation Foundation for a number of prepaid health care plans. The rates have been adjusted to reflect anticipated levels of utilization in a specific plan.

In addition to the services shown in the table, it is necessary to develop utilization rates and costs for surgical encounters, lab and x-ray procedures, outpatient hospital visits, maternity services, prescriptions, and several others depending on the plan. As with assumptions relating to hospital days and physician encounters, it is necessary to make ad-

of similar services included in group insurance experience, and the costs of administration under the HMO may be considerably different.

IV. *Actuarial Approach:* Under this approach, the age-sex distribution of the subscriber group expected to be enrolled is determined and a utilization rate by age-sex group for each category of HMO medical service is developed. In addition, the price of each incidence of medical service utilization is determined. The combination of this data will result in the hospital and medical care component of the capitation. The table below shows the application of this technique to two types of health care service.

	Annual Rate per Subscriber		Physician Encounter (Non-Surgical)
	Hospital Days Male	Hospital Days Female	
	.375	.600	4.100
	.375	.560	4.400
	.530	.720	5.300
	.700	.900	6.100
	.950	1.100	7.400
	1.200	1.400	8.800
Average Rate of Utilization	.528	.728	5.114
Average Cost Per Use	\$ 93	\$ 102	\$15.00
Monthly Capitation for Indicated Service	\$4.09	\$ 6.19	\$6.39

justments based on a subjective evaluation of the components of a specific plan. When the evaluation of the cost of medical and hospital services is completed, the administration and other costs of the HMO can be added, being determined in a manner consistent with the *Integrated Budgeting* approach.

Of course, even if any one of the foregoing methods produced totally reliable results, the capitation rate thus produced is subjected to thorough review by physicians whose financial well-being depends on the adequacy of the rate and by the marketing staff for whom the rate must be reasonable in relation to the going cost of conventional health insurance plans.

In any event, it is anticipated that interest and involvement of insurance companies with operational HMO's will result in more valid data for actuaries to use in evaluating the value of HMO health care service benefits. □

TO BE CONTINUED**Deferred Taxes***by Robert L. Lindsay*

A guide for auditing stock life insurance companies has been introduced by the AICPA which describes the adjustments which should be made to statutory financial accounting to produce reports which conform to generally accepted accounting principles (GAAP). Under GAAP, stock companies will recompute reserves, spread acquisition costs, etc.; the resulting gain from operations will differ from the statutory gain and from the gain reported in its federal income tax return.

Accounting Principles Board Opinion No. 11, "Accounting for Income Taxes," stipulates that provision for deferred tax is required where there are timing differences. That opinion says that "timing differences originate in one period and reverse or 'turn around' in one or more subsequent periods." This contrasts with permanent differences which arise "from transactions that, under applicable tax laws and regulations, will not be offset by compensating differences in other periods." The deferred tax provision must allow for "differences between the periods in which transactions affect taxable income and the periods in which they enter into the determination of pre-tax accounting income."

Appendix C of the August 1972 Exposure Draft describes how to account for deferred taxes. Those responsible for tax work should carefully read Appendix C and APB Opinion No. 11. They should also confer with their outside auditor for interpretation. Now that you've been properly warned, I'll briefly summarize the more important aspects of deferred tax accounting as it applies to life insurance companies.

(1) Taxable investment income in general will not be restated.

(2) Those companies which are currently taxed only on taxable investment income need not provide deferred taxes on timing differences affecting gain from operations if they can reasonably demonstrate that there will be no tax effect in the future (i.e. they will continue to be taxed only on taxable investment income). Hence, most mutuals and many large stock companies can ignore the problem.

(3) Deferred taxes need not be pro-

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