GROUP LIFE INSURANCE

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1. How does current group mortality compare with the 1960 Basic Group Mortality Table? What is the relationship of female mortality rates to male mortality rates?

2. How do the premium rates of insurance companies, after applying the volume discount tables, compare with the 1960 Basic Group Mortality Table?

3. What groups' and industries' experience indicate the appropriateness of premium discounts and loadings?

4. To what degree are alternative funding approaches, such as retrospective premium agreements, utilized for group life insurance?

5. How many life years of exposure are necessary for 100% credibility to be given to the experience of a group in determining premium rates? Is life years a satisfactory measure of the predictability of group life insurance experience?

6. What measures are utilized to hold experience fund deficits to a manageable level for group life insurance coverages?

7. What is the proper reserve for pending or unknown death claims? Pending or unknown disability waiver of premium claims? What is the proper reserve for approved waiver of premium claims? Is it general practice to credit the experience fund with the amount of waiver of premium claim in the event of recovery?

MR. MICHAEL E. SPROULE: The group life market has undergone a metamorphasis in the last 5 years. The major cause of the dramatic changes we have seen is the change that took place in the New York Minimum Group Life Premium regulations. On June 11, 1973 the New York Group Life Minimum Premium regulation was removed and in its current form, Regulation 32 permits companies licensed in New York to quote rates below New York First Year Minimums under most conditions. As a result, New York companies have found that for most new groups they no longer are prevented from quoting rates competitive with those used by non-New York companies.

In day-to-day terms this meant that many companies had to face a number of problems which formerly were of lesser importance to them. What group mortality rates by age and sex should they use? What adjustments, if any, should be made to account for differences in the mortality levels of various industries? What credibility should be given to the prior experience of the group in establishing a rate basis? These were not new questions for New York companies to be asking. What mattered was that the answers were now important both to retain existing groups and attract new ones. Further,

allowing New York companies to compete with non-New York companies on rates significantly increased competition outside of New York on cases where rates already were important.

The statutory determination of minimum premium rates for group life insurance dates from 1926 in New York. This development came about as a result of concern by the Superintendent over the intense competition for new business which he feared would be harmful to the companies and demoralizing to the then infant group insurance business. What resulted was the so-called T-scale of rates. As mortality continued to improve, adjustments were made over time.

When the minimum premium laws were virtually eliminated in 1973, most New York licensed companies were basing their rates on the then current New York Minimums: the 1960 CSG Mortality Table at 3%, a 40% female discount, and volume discounts of up to 35% depending on the size of the group.

To understand the problems associated with basing group life rates in a competitive environment on the 1960 CSG Table one need look no further than the fact that the table was based on combined male and female data for the period 1950 to 1958 and that it provided margins of 20% plus 1 death per thousand.

TABLE 1

Comparison of 1960 Commissioners Standard Group Mortality Table and 1960 Basic Group Mortality Table

Age x	1960 C.S.G. qx (1)	1960 Basic qx (2)	(1) ÷ (2) (3)
20	.00209	.00100	2.09
30	.00240	.00117	2.05
40	.00402	.00252	1.60
50	.00952	.00710	1.34
60	.02262	.01802	1.26
70	.05233	.04278	1.22

The 1960 Basic Group Mortality Table is essentially the 1960 CSG Table with the margins removed. A simple comparison of the mortality rates of these two tables reveals that the mortality margins included exceeded 100% through age 30 and dropped to around 25% at retirement. Further, these tables are combined male and female tables. Reasonable assumptions on the relationship between male and female mortality rates and on the percentage of the exposure attributable to females lead to the conclusion that the 1960 CSG contained margins for young females of over 200%, that is, the mortality rates were more than 3 times the level required.

The problem with the 1960 CSG Table as a basis for establishing Group Life rates was not that it contained significant margins, that could have been corrected by charging some percentage of these rates, the problem was that the margins varied so substantially with the age and sex characteristics of the group with very high margins on younger female groups and lesser margins on older male groups. Anyone still using the 1960 CSG Table as a basis for

Manual Rates is undoubtedly applying "underwriting judgment" in an attempt
to overcome the significant problems associated with using this table as a
basis for rate setting.

While the 1960 Basic Table is somewhat better as a basis for establishing
Group Mortality rates in that it does not suffer from this problem of vary-
ing margins, there are other difficulties with using this table for rate
setting.

First, the Basic Table is a combined male/female table and does not recog-
nize the substantially lower mortality rates attributable to females.

TABLE 2

Age x	1976 United States Population Female Mortality Rates as Percent of Male Mortality Rates	1970-74 Group Mortality Ratio of Female to Male Mortality Rates
22	35%	28%
32	47%	59%
42	55%	61%
52	52%	43%
62	50%	41%
72	53%	48%
82	66%	63%

Both population data and the 1970-74 Group Life Mortality Study provide
useful data on the extent of this difference. A review of the ratios of
female to male mortality rates shows low ratios of around 30% at age 20
which increases to about 60% at age 40, then decline to about 40% at age
60 and finally increase continually through the older ages. The ratios
of male to female mortality follow a roller-coaster pattern. This pattern
as shown in the 1970-74 Group Mortality Reports is also found in both
United States Population rates of mortality and Group Mortality studies
published by the Canadian Institute of Actuaries. Female mortality
averages slightly less than 50% of male rates* in the 1970-74 Reports
although there is a substantial range from 30% to 60% over the working
years. The relationship between male and female rates varies sufficiently
over this important age range to justify carriers developing their group
life rates from separate male and female tables.

The second major question on the use of the Basic Table is that of improve-
ments in mortality. The Basic Table was developed from experience for the
period 1950 to 1958. A full eighteen years have elapsed from the mid-point
of this experience period to the mid-point of the 1970 to 1974 experience
published in the 1975 Reports.

*weighted by male exposures by age bracket.

Age-adjusted death rates in the United States* have declined from an
average of 7.9 per 1,000 population for 1950 to 1958 to 6.9 per 1,000
for 1970 to 1974 or a drop of 12%. While the annual improvement has been
small in the last two decades, something between 1/2 of 1% and 2/3 of 1%
per year, the accumulated improvements are important for carriers seeking
to remain competitive in an intensely competitive market.

Changes in the levels of mortality of the general population are not, of
course, necessarily indicative of comparable changes in the levels of group
mortality. To examine changes in the Group Mortality, I examined Actual/
Tabular ratios based on the 1960 Basic Table for the Waiver of Premium and
Extended Death Benefit clauses combined with the Waiver of Premium dis-
ability claims cut back to 50% of face to more appropriately reflect the
present value of these claims.

TABLE 3

Ratios of Actual to Tabular Claims Based on the 1960 Basic Table

Period	Waiver of Premium	Extended Death Benefit	Combined**
1960–64	90.2	90.9%	90.3
1965–69	90.9	89.4%	90.6
1970–74	87.4	79.3%	86.1

**Weighted by relative exposures of the two disability provisions

The actual/tabular ratios declined from 90.3% for the 1960-64 period to
86.1% for 1970-74 for a mortality improvement of 4.7% over the 10 year
period. It should also be noted that a portion of this improvement in the
ratios must presumably be attributed to the increasing numbers of women in
the workforce. Department of Labor figures show that the female percentage
of the workforce has grown from 32% in 1960 to 37% in 1970. It would be
reasonable to expect comparable increases in the percentage of the data
contributed to the Society studies that is on female lives. On the other
hand, corrective action by carriers to reduce the number of unreported
Waiver of Premium disability claims has acted to reduce the reported
mortality improvements. After adjusting for these factors, it appears that
we have been seeing annual improvements in group mortality levels of ap-
proximately the same magnitude as have been experienced by the population
as a whole.

A third factor affecting the use of the Basic Table for setting premium
rates is the fact that this table was based on lives, not amounts. The
authors of the 1960 Basic Table felt "that the experience by amounts was
not as favorable as would appear from the experience compiled by lives
especially with the provision in recent years of more substantial amounts

*Life Insurance Fact Book

of insurance and the more liberal underwriting practices prevalent gener-
ally."* Since that time amounts of group life insurance on individual
lives have increased dramatically while underwriting practices have gen-
erally become even more liberal. Group mortality studies conducted by the
Canadian Institute of Actuaries indicate that experience by amounts is
around 7% better than the experience by lives. This should not be sur-
prising when you consider the common practice today of life insurance
benefits being a multiple of salary. The correlation between salary and
other socioeconomic factors such as education, lifestyle and family back-
ground that favorably influence mortality should lead to our expecting
this result.

Prior to this session a questionnaire was sent out to the 40 leading group
insurance companies and 60% responded. Over 75% of the companies believe
the experience published in the Society's Reports is an appropriate basis
for rate setting. Interestingly, a comparable percentage had no opinion
when asked if their own companies' experience confirmed that of the Society's
study. Of those who did venture an opinion, most indicated that their own
company's experience generally confirmed that of the Society of Actuaries
by age, sex and industry.

When it comes to developing rates, over 70% of the responding companies
indicated that they use the Society Reports as the basis for rate setting,
generally with modifications to reflect both Company experience and
judgment.

The next area I would like to discuss is the variation in group mortality
rates by industry. The mortality reports of the Society of Actuaries have
long included an analysis of experience by industry using the Standard
Industrial Classification, or SIC code of the United States Bureau of the
Budget.

The 1975 Reports provide a great deal of extremely useful information on
the relative experience levels of various industries. Certain industries
such as banks, hospitals and school teachers have long had a reputation of
displaying particularly favorable mortality. In an era of rate regulation
based on a table, the 1960 CSG Table, that included particularly large
margins on young female groups the favorable experience shown by such
industries is not surprising. The question I would like to address is the
extent to which industry variations remain after appropriate adjustments
have been made for the age and sex characteristics of the group.

While most companies appear to be using the Society's reports in developing
rates, there were comments on the responses to the questionnaire that com-
panies appear to be misusing the data by not using only the sex distinct
data or by not adjusting the sex-unknown data to reflect female exposures
in the particular industry. Making such an adjustment is extremely impor-
tant to the development of appropriate industry factors.

*TSA XIII, "The Commissioners 1960 Standard Group Mortality Table and
 1961 Standard Group Life Insurance Premium Rates", Morton Miller, p. 592.

I will take a specific example and examine the importance of making such an adjustment. Hospitals are one of the industries which have generally been recognized as having extremely favorable experience. The 1975 Reports show an Actual/Tabular claims ratio for the Medical Services category of 72% for all disability clauses combined. Tabular claims here are based on the ex- perience for the 1970 to 1974 period covered by the reports. Of the total of 673,000 years of exposure on this industry, 56% were not coded by sex. Of those exposures coded by sex 78% were female.

For all industries combined, the sex known data is 30% female. It would, therefore, be reasonable to estimate that the sex-unknown data is also 30% female. For the Medical Services industry, the sex known data is 78% fe- male. Likewise, it would be reasonable to estimate that the sex-unknown data for this industry is 78% female.

Tabular claims for the sex-unknown data are based on the rates of death for all sex-unknown data combined. Clearly, the substantial difference between the female content of the tabular (i.e. 30%) and the female content of the medical services industry (i.e. 78%) result in tabular claims being overestimated for the medical services industry and too low an Actual/ Tabular claims ratio.

Assuming female mortality is 50% of male mortality, tabular claims for the sex-unknown exposures can be adjusted to properly reflect the female content of the industry and the tabular claims for the medical services industry would be reduced by 13%. The 72% starting claim ratio would be increased to 83%. As a good check, this overall result should be compared with the combined Actual/Tabular ratio for the sex-distinct data. Here the sex- distinct data produces an Actual/Tabular ratio of 91%. Either the assump- tions made were inappropriate or there is something different in the mor- tality levels experienced by the sex-coded as opposed to the non-sex coded data.

The 1975 Reports provide industry data based on the two digit SIC Code. For the 65 industries having at least 10,000 life years of exposure the unadjusted ratios for all disability provisions show 33 industries or 51% with a deviation of less than 7% (see Table 4). The adjusted ratios show 40 industries or 62% with a deviation of less than 7% (see Table 5). Further, the unadjusted ratios show 16 industries or 25% with a deviation of 17% or more. The adjusted ratios show only 7 industries or 11% with a deviation of 17% or more.

Responses to the questionnaire indicated that only 30% of the responding companies took account of industry deviations of as small as 7% when setting rates. However, almost 80% of the responding companies reflected industry deviations of 8% to 12% when developing rates. It would thus appear that the most general industry-wide approach might reflect variations in industry levels of mortality for about one-third of all industries with the great majority of groups (approximately two-thirds) being quoted at standard rates.

TABLE 4

Unadjusted A/T Ratios
by Industry
for All Ages and Disability Provisions

A/T Ratio 1970 to 1974 Experience All Ages and All Disability Provisions	Ind. Code	Number of Industries*
1.23 and up	10,16,21,32,41,44	6
1.17 to 1.22	33,75	2
1.13 to 1.17	13,17,26	3
1.08 to 1.12	19,34,35,42,93	5
1.00 to 1.07	20,24,25,28,31,36 37,49,54,57,70,79, 91,92,99	15
.93 to .99	01,07,15,22,27,29, 38,39,47,48,50,52, 62,63,67,72,73,86	18
.88 to .92	30,45,55,58,61,64, 65,89	8
.83 to .87	53	1
.78 to .82	23,56,59,60,81,82	6
.77 and lower	80	$\underline{1}$ 65

*Limited to those with at least 10,000 life years of exposure

TABLE 5

Adjusted A/T Ratios
by Industry
for All Ages and Disability Provisions

Adjusted A/T Ratios 1970-74 Experience (Death Claims Only)	Industry Code	Number of Industries*
1.23 and up	16,21,32,44	4
1.17 to 1.22	10,41,75	3
1.13 to 1.17	26,31,33	3
1.08 to 1.12	57	1
1.00 to 1.07	13,17,22,25,34,35, 36,42,49,53,54,70,72, 91,93	15
.93 to .99	15,19,20,23,24,27,28,37 38,39,47,48,50,52,58, 61,62,63,64,65,67,73, 79,92,99	25
.88 to .92	01,07,29,30,45,60,86	7
.83 to .87	55,56,59,80,81,82,89	7
.78 to .82		0
.77 and lower		0
		65

*Limited to those with at least 10,000 life years of exposure

At times I am sure we have all marveled at the willingness of our profes-
sional colleagues to smell the perfume of the premium and ignore the
odor of the risk. Indeed at Society workshops in the past, I have heard
many Group Actuaries admit that their company has yet to turn a profit
on its group business.

A little of the concern that originally prompted the New York Insurance
Department to establish First Year Group Life Minimums can be seen in
the present marketplace. However, in the long run I believe this
competition will be healthy for the industry and will force all group
actuaries to be more cognizant of the basic development of their rate
structures and funding alternatives.

MR. DAVID S. WILLIAMS: It is interesting to compare the recent inter-
company mortality studies published by The Society of Actuaries and the
Canadian Institute. I selected the Society inter-company study covering
the years 1970-74 for the sake of comparison with the Canadian Institute
study which covered the years 1968 to 1972. Each study produces crude
mortality rates for all industries, including exposures for all groups
except those covering very small numbers of lives. In each case, we
are looking exclusively at male lives insured under the waiver of pre-
mium disability benefit. A comparison of this data shows that Group Life
mortality in Canada is running at about 90% of mortality in the States.
This relationship is quite stable throughout the range of working ages,
except in the early twenties, at which time of life Canadian males seem
equally as likely to meet with fatal accidents as their American cohorts.

Comparison of Recent Group Life Mortality Rates
For Male Lives In The U.S. and Canada

Central Age	Society Intercompany 1970-74 (1)	C.I.A. 1968 - 72 (2)	(2)÷(1) (3)
23	1.44	1.48	103%
28	1.22	1.12	92
33	1.40	1.12	80
38	1.94	1.73	89
43	3.38	3.08	91
48	5.69	5.35	94
53	9.94	8.91	90
58	16.93	15.42	91
63	22.89	20.85	91
Weighted average rate	5.83	5.30	91

Sources: (1) 1975 Reports, p. 200. Groups of > 10 lives.
          (2) CIA Mortality Committee report. Groups of
               > 25 lives.

Note: Rates for central ages 58 and particularly age 63 are
                   affected by differences in the design of the Waiver
                   clause benefit and resulting reporting difficulties
                   encountered by some of the contributing insurers.

Several other points of interest might be noted:

(1) The Society Committee does not collect experience by amounts, but
     this is done by The Canadian Institute. According to informal
     studies prepared by the CIA Group Mortality Committee, Canadian
     group mortality has tended to run slightly higher by lives than by
     amounts, at least for the waiver of premium benefit.

(2) On a lives basis, female mortality is averaging about 50% of that
     for males in Canada. This is more or less consistent with U.S.
     experience.

(3) The Canadian Institute publishes Group Life mortality data by geo-
     graphic region, and this continues to show the same substantial
     differentials that appear in the population mortality tables by
     province, published every five years by the Canadian government.
     Mortality in the prairie provinces is running at about 80 to 85%
     of that for the rest of Canada. Presumably differentials exist
     in the States, and this raises what seems to me to be a very in-
     teresting point. The underlying reasons for these differentials
     would seem to have significant public health implications, and if
     any of you are aware of such studies, perhaps you would draw our
     attention to them later on in the session.

The next item on the agenda that I would like to discuss is question 5.
How many life-years of exposure are necessary for 100% credibility to be
given to the experience of a group in determining premium rates?

I guess from the marketing executive's view-point, the answer is "too
many". I've worked out some figures for a group with a typical age dis-
tribution, using the stop-loss algorithm developed by John Mereu of London
Life in a Society paper several years ago. Using this quite elegant ap-
proach, which can be programmed in APL using a handful of instructions,
you can develop for any group, the cumulative probability that the aggre-
gate claims during a given period of time will not exceed x dollars.
Rather than describe this in words, it might be more helpful to set it
up in chart form.

Use of Stop-Loss Algorithm to Display Confidence Limits on Credibility
of a Group Life Policy with 10,000 Life-Years of Experience.

Actual No. of Deaths x	Prob. that Actual No. of Deaths Will be ≤ x	Stop-Loss Premium
1	< 10^{-10}	$51,000
.		
.		
.		
40	.048	12,200
.		
.		
.		
51 (expected no. of deaths)	.478	3,400
.		
.		
.		
63	.942	200

Assumptions: Typical age distribution, estimated current net mortality
              rates, no disability benefit provision, flat certificate
              amount of $1,000.

Running through several examples like this with increasing numbers of
life-years of experience, you will find that the 5% confidence limits
gradually converge. However, even with 50,000 life-years of exposure,
you cannot have 90% confidence that the actual mortality experienced is
within 5% of the true expected mortality.

The enormous requirements in terms of life-years for a reasonable degree
of credibility mean that, at least in the Canadian marketplace, a theo-
retically sound credibility formula cannot survive.

The agenda includes a related question, "Is life-years a satisfactory
measure of the predictability of group life experience?"

From a practical standpoint probably yes. However life-years as a measure
of predictability does have certain limitations:

(a) life-years fails to take account of the age/sex distribution of a
     group. Thus a group of largely female lives and an average age of
     35, would need four times as many life-years of exposure for its
     experience to be accorded the same degree of credibility as a group
     of largely male lives and with an average age of 45. The reason for
     this, as you know, is that an increase in the probable incidence of
     claims decreases the volume of exposure necessary to achieve a given
     level of credibility.

(b) the degree of variation in certificate amount affects the predict-
    ability of a group's financial experience, and a combination of
    variation by age and amount, if there is a high positive corelation,
    can significantly reduce the group's level of predictability by
    increasing the amplitude of variation of the group's aggregate
    claims each year about the true or expected mean value.

(c) a more subtle difficulty lies in the fact that a given year's
    experience, as it recedes into the past, loses credibility by
    this process alone. If you were setting a rate now for a 1,000
    life group, the 1977 experience would be of much greater signifi-
    cance than the 1967 experience of the same group. This is due to
    the improvement in mortality in the interim, of course, but even
    more, due to changes in the nature of the firm's operations, the
    nature of the jobs performed, personnel policies, the local en-
    vironment and a large number of even less tangible factors.

With these considerations in mind, you cannot escape the conclusion that
credibility is a difficult concept to cope with in the marketing and
administration of group life contracts.

We would all like to have a perfect solution to the next question "What
measures are utilized to hold experience fund deficits to a manageable
level for Group Life insurance coverages?"

It is axiomatic that a fully pooled block of business which is written
at rates just sufficient to cover claims and expenses, would produce a
profit equal to the interest earned on total cash flow. At any point
in time, the liabilities on this block of business would consist primarily
of the provision for pending and unknown claims, plus the reserves on dis-
abled lives under the waiver of premium benefit. Assuming that the busi-
ness is reasonably mature, these liabilities might reach 100% of the
block's annual premium income, so that annual profits from investment
earnings could reach a level of 6 or 7% of the annual premium.

If this block of business is to be experience-rated however, profit will
be reduced by the payment of refunds and the establishment of any re-
serves, such as claims fluctuation reserves, which are potentially re-
fundable. These refunds would come about not only because of favourable
claims experience, but might also arise because of the insurer's practice
of allowing interest credits to policyholders on some portion of the
funds retained under the policy. In this manner, the experience-rating
formula could well pay out more than the profits generated by earned
interest. Such a block would then generate a continuing loss.

To avoid such a loss situation, the experience refund formula could be
curtailed so that it would pay out less than the block's interest earn-
ings. However the result would probably not be sufficiently attractive
for those policyholders enjoying favourable experience, so that in prac-
tice, a margin must be incorporated in the premium rate structure and
deducted in the form of a specified risk charge assessed against the ex-
perience fund. The scale of risk charges should be designed taking into
account the probability that a case will get into a deficit position,

and that it would cancel while in this position. The probability of cancellation will presumably increase as the cumulative deficit increases. Also, the size of the risk charge for a given group should vary by size and age/coverage configuration, in somewhat the same manner as a stop-loss premium should.

In order to minimize the size of the risk charge that must be siphoned off the experience funds of profitable groups, insurers generally use a combination of methods to limit experience fund deficits. At my Company, we are currently using each of the following methods on one or more cases:

(1)   Incorporation of specific, non-returnable risk charges.

(2)   Use of a cumulative credibility formula under which the assessed claim charge is a weighted average of expected claims and actual claims.

(3)   Pooling of excess certificate amounts.

(4)   Catastrophe cover.

(5)   Stop-loss cover.

(6)   Rate basis guarantees over multi-year periods with experience rating only at the end of such period.

When a policy is in a surplus position, one can make some provision for a future rainy day by:

(7)   Establishment of ear-marked claims fluctuation reserves.

(8)   Accelerated write-off of unamortized acquisition expenses, where the expense formula is designed so that this can be done.

For policies that have the misfortune to be already in a cumulative deficit position, one or more of the following measures must be considered:

(9)   Revision of premium rate basis.

(10) Modification of benefit schedules.

(11) Cross-rating with associated Health coverages.

We have found that some combination of these approaches can nearly always be negotiated with the policyholder. Such negotiations seem to be more difficult however, if they are postponed until the policy is already in a substantial deficit position. Under such circumstances, the principle of carrying deficits forward may have to be placed on the table as a negotiable item.

The final item on the agenda is claims reserves. What is the proper reserve for pending or unknown Death and Waiver claims?

It is necessary here to distinguish between Statement liabilities on one hand and policyholder experience fund statements summarizing the operations under particular group plans. For Statement liability purposes, theory suggests that the proper reserve for pending (i.e. reported but unapproved) claims should be determined in the form of a percentage of the expected annualized rate of claims at year end, with this percentage being based upon the actual experience of previous years.

With regard to unknown (i.e. incurred but unreported) claims, the most appropriate basis would seem to be the expected claims for the last quarter multiplied by an experience factor determined by analysis of previous years' actual to expected claims results. For a large block of business, this factor should exhibit reasonable stability.

In the preparation of experience fund statements, a formula approach based upon the same parameters is typically used, with the formula being designed to produce an aggregate liability for the block which is marginally greater than the corresponding Statement liability. In the case of a jumbo plan, the Statement method might be applied to the plan's previous years' experience if the plan is indeed large enough. In fact, if the experience of jumbo cases differs markedly from average, it may be desirable to segregate them for the purpose of deriving Statement liabilities. This can happen, for example, where Waiver claims reporting is linked to the reporting of Long Term Disability claims, especially if the elimination period for LTD relates to a generous "sick pay" programme. Some creditors policies, because of their size and their administrative peculiarities, may require separate attention. Reinsured or coinsured business may also need special handling, in the case of guaranteeing companies, because of the additional lag in reporting through the principal or administering company. In my company, we do determine our Statement liabilities giving recognition to the special characteristics of certain classes of business such as these.

What is the proper reserve for approved Waiver of premium claims? Most Canadian companies appear to be using the 1970 Inter-Company Group Life Disability Valuation Table (Krieger's Table) for reserving purposes. I have not seen at first hand any recent studies testing the continuing validity of Krieger's Table as an accurate reflection of current Waiver continuance experience, but the general impression is that Krieger's Table continues to produce appropriate reserve factors. Incidentally, it can also be argued that, because of the increased likelihood of conversion by disabled lives reaching age 65, when scheduled reductions in coverage often occur, an age-specific conversion charge should be factored into the reserve calculation.

The final question on my platter is "Is it general practice to credit the experience fund with the amount of the Waiver claim reserve in the event of recovery?" In both Canada and the U.S., it is the general practice to do this.

As a result, the appropriate method for calculating the reserve on a given claim is to provide for payment of the face amount in the event of death, and in the event of recovery, return of the current reserve to the policyholder's experience fund. Allowing for re-payment of reserve on recovery increases the reserves, especially at earlier ages and durations. Approved Waiver claims under non-pooled policies should therefore be reserved on the higher basis for both experience fund and Company statement purposes. Of course, the probability of recovery decreases rapidly as the duration of disability increases, so that on a mature block of business, the increase in reserves resulting from allowing for return of reserve on recovery will be something of the order of 5%.

It is perhaps not immediately obvious that providing for return of the reserve in the event of recovery should have the effect of increasing the reserve required to be held on a given claim. To demonstrate this in a simple manner, I have made up a little table showing the derivation of the reserve on a zero interest basis:

$$\ell^T_{[40]+t} - \ell^d_{[40]+t} - \ell^r_{[40]+t} = \ell^T_{[40]+t+1}$$

If the reserve is refundable on recovery, then for the purpose of calculating reserve values, a new single-decrement table of $\ell^D_{[x]+t}$ values can be constructed based on $d^d_{[x]+t} / \ell^T_{[x]+t} = q^d_{[x]+t}$ values.

If the reserve is <u>not</u> refundable on recovery, then the double-decrement table is required for determining reserves:

Zero-interest reserve, assuming	Reserve Refunded on recovery	No Refund on recovery
- Waiver to 65	$\dfrac{\ell^D_{[40]} - \ell^D_{65}}{\ell^D_{[40]}}$ = 0.888	$\dfrac{\sum\limits_0^{24} d^D_{[40]+\bar{t}}}{\ell^T_{[40]}}$ 0.640
- lifetime waiver	1.0	0.650

MR. GERALD W. GRISWOLD: I would like to describe how Pacific Mutual looks at and approaches Group Life pricing, experience refunds, and reserving in response to the questions presented for this session.

As background, Pacific Mutual writes a cross section of Group Life and Health business, and in 1977 we had approximately $38,000,000 of Direct Group Term Life premium in force. We have our share of the MET business as well as a few jumbo cases. Our Net Gain record for Group Life, except for 1977 when we did some reserve strengthening, has been steady, but not spectacular.

Like many other insurance companies, we are desirous of writing as much
Group Life Insurance as possible - hopefully with a reasonable margin
for risk and profit. Group Life is,in fact, getting special emphasis
at Pacific Mutual for several reasons:

    1. It has historically proven to be a profitable line of business.

    2. The Premium rates generally have not needed to be increased and
        therefore, the turnover of cases has been low.

    3. Perhaps most importantly, the possibility of some form of National
        Health Insurance has caused us to pursue Group Life more ardently.
        As a general practice, we will not write the medical or disability
        coverages unless we write the Group Life coverage.

The rate competition sometimes becomes quite intense with a large spread in
the rates between companies. This current competition in the Group Life
market and loss of the companion health coverage to Self-Insurance or to
the Government will reduce total case margins as a dollar amount and in-
crease the risk and possibility of losses in the future.

For pricing we use a conventional approach with a formulated combination
of our Manual rates and the experience of the case. Manual rates are a
modification of the 1960 CSG Minimum Group Life gross premiums.

Expected female mortality is assumed to be 50% of male mortality. We
recognized that this is an administrative simplification and that there
should be some variation by age, but it is felt that the refinement would
have an insignificant affect on the composite rate charged any group.

Recently we applied the Industry Statistics published in the 1975 Reports
to develop a complete set of Life Industry Adjustment Factors by classifi-
cation code. Our own experience by industry did not tie in as closely as
we would have liked with that of the Society's, but the credibility of our
statistics is certainly questionable.

The Society's experience by Industry indicates a wide spread in the Actual
to Tabular Disability experience for plans with Waiver of Premium coverage.
We found significant differences in premium waiver claim frequencies not
only by Industry but also between companies within the same industry.

It is too early for us to judge or measure the affects of utilizing the
new Industry Adjustment Factors in our manual rates, but we are hopeful
it will make us more competitive while still maintaining a margin for
profit.

In addition to our review of the manual rates by age, sex and industry, we
also review quarterly the relationship of company incurred claims to our
manual premiums and establish expected claims expressed as a percentage of
manual. We keep the experience separated on large cases to not distort
the results of this study. In the past 10 years, we have re-
duced the expected claims in our rating calculations by a total of 15%.

It is impossible to accurately compare our experience to that of the 1960 CSG Basic Mortality Table but our expected claims for males are approximately 100% of the table at age 21 and 83% at age 65. The percentages do not include the Industry Adjustment Factors which range from minus 25% to plus 50%.

For Dividend calculations we use two pooling approaches to reduce case deficits (what I refer to as Experience Rating). First we pool the total case experience for those cases with less than a minimum amount of Life and A&H premium. We then provide partial experience rating from the minimum size case to the fully experience rated size case.

In addition, we pool individual life amounts in excess of the annual life premium of the case rounded to the lower $5,000. The experience of this pool is kept separately and it does not indicate anti-selection at the higher amounts of insurance.

With reference to the question on Group Life reserves, it seems appropriate to differentiate between case reserve calculations, (those used for rating and dividend calculations) and company or statement reserve calculations.

Our case reserves are calculated as the sum of one "factor" times the preceding twelve months manual premium and a lower "factor" times the preceding 24 months manual premiums. Added to this are all known claims incurred prior to the reserve date which are pending or have been paid during the period the reserve is held open for a runout of claims. The factors are based on studies of our claims lag patterns and reflect the various types of Group Life disability provisions as well as the number of months held open (normally two months for experience rating).

On premium waivers we follow the practice of charging a flat $750 per $1,000 to the case at time of approval and reverse that amount in the event of recovery, or charge the additional $250 per $1,000 in the event of death.

One of the biggest case reserving problems faced is in those situations where the policyholder continues to pay premiums on disabled lives and thereby delays their being reported as premium waiver claims as provided for by the Policy. Notices are sent periodically to the policyholder reminding them of the twelve month limitation on premium payments for disabled lives.

Company reserves are calculated and tested quarterly. Claims maintained by month of payment and month of incurral, (defined as the date of death for the Exhibit 11, Benefit Liability), provide us with a method to calculate monthly lag factors. The paid and incurred claims by month of incurral are divided by the lag factors to arrive at the estimated incurred claims. The benefit liability is then the summation of the estimated incurred claims less the paid claims.

This method provides an accurate test of our reserve calculations in sub-
sequent quarters and we can make seasonal or other adjustments as required.
The benefit liability calculated in this fashion automatically includes
the liability for claims in the course of settlement (pending claims).
For Pacific Mutual, this reserve is approximately 15% of the annual life
premium.

The reserve for approved premium waivers is based on the 1970 Intercompany
Group Life Disability Table at 3%, applied to the outstanding premium
waiver claims.

For the incurred but unreported premium waiver reserve liability we derive
a separate set of lag factors using the approved premium waiver reserves
by month of incurral (date of disability) and date of approval. The re-
serves for the reported premium waivers are divided by the lag factors to
get the total estimated waiver reserves by month of incurral with the dif-
ference being the reserve for incurred but unreported premium waiver claims.
This reserve will run 25% to 35% of our annual life premium. We do have
several large cases which experience very high frequencies of premium
waiver claims and have long lags in reporting.

In addition, we have a reserve for those disabled lives who will die prior
to becoming eligible for premium waiver and therefore, they are not included
in the premium waiver reserves. This reserve is based on modifications of
the 1947 to 1949 Intercompany Disabled Life experience and a 3 1/2% interest
assumption and it is approximately 10% of premium.

And lastly, we carry mean reserves for the Group Term Life based on the
1960 CSG Mortality Table with interest at 3 1/2%. This reserve assumes
that premiums are paid annually in advance and therefore, a deferred net
premium asset is established for the remainder of each case's policy year,
since the premiums are normally paid monthly.

I would now like to share with you some additional results of the survey
which was taken in preparation for this session.

With reference to questions on the credibility of prior experience, when
the companies base their credibility on

                Lives ----------- The Range for $\emptyset$ credibility was from
                                  50 to 1,000 lives

            Life Years ------ 500 to 5,000

    or Based on Expected Deaths- the companies assumed $\emptyset$ credibility
                                when there were less than 5 expected
                                deaths.

                        100% Credibility

                Lives ----------- 500 to 1,000

                Life Years ------ 3,000 to 100,000

        or Based on Expected Deaths- 67 to 250

                Three companies stated they never give full credibility.

Pacific Mutual uses life years in its credibility formula for all cases
with 35 or more lives. Theoretically, we never give 100% credibility to
the case experience -- but there are exceptions.

In answer to a question on funding methods, the companies say they are
offering the retrospective rate agreement approach (17 companies) and the
extended grace period (14 companies). One company has used ASO with Stop
Loss and another Cost Plus. Pacific Mutual has successfully used a pre-
mium deposit fund approach whereby premium margins or Stabilization Re-
serves have been held in an interest bearing account to be used for future
premium purposes if required. Also, we have used the extended grace period
for many cases.

We are starting to see greater interest in other funding techniques which
would reduce the investable reserve funds which we hold. The move to these
special funding methods has been slow compared to the action in the Medical
coverage area. For one reason, the Group Life reserves are relatively
insignificant in the U.S. as compared to Group Health and for another,
the tax laws have discouraged self-insured death benefits. Whereas death
benefits under an insured plan are free of federal income tax, the amount
in excess of $5,000 is taxable under a self-insured plan.

Some Policyholders are requesting that we delete the Premium Waiver provi-
sion in the contract and permit indefinite premium continuation for disabled
lives. This would hold down the incurred claims by eliminating the charges
and reserves for premium waivers. We would then be assuming a greater risk
for future conversions at a cost per $1,000 for the disabled lives signifi-
cantly greater than our current $65 charge.

This is a particular problem in California where Senate Bill 366 (Discontin-
uance and Replacement) requires a conversion privilege or continuation of
coverage for disabled lives at the time of Individual or Case termination.
A special reserve or funding of this new liability will be required.

The question of controlling experience fund deficits through pooling was
also addressed in the survey:

> 23 of the companies pool large individual life claims.

> 9 pool excessive total life claims.

> 10 use a credibility calculation for charged life claims.

> and 4 use an aggregate deficit limitation.

Other methods mentioned were -

> - "negotiated deficit forgiveness" (2 companies)

> - "contingency reserves" (2 companies)

> and a - "catastrophic loss provision" (1 company)

The majority of companies also reported that for experience rating they hold the books open for one or two months beyond the anniversary date to record unreported claims.

And in reply to questions on reserve levels:

> For unreported death claims:
>
> > 0 - 7% of premium   16 companies
> >
> > 8 - 12% of premium   6 companies
> >
> > 13 - 17% of premium   1 company
>
> For unreported waiver of premium claims:
>
> > 0 - 7% of premium   6 companies
> >
> > 8 - 12% of premium   11 companies
> >
> > 13 - 17% of premium   3 companies
> >
> > 18 - 22% of premium   2 companies

MR. EDWIN C. HUSTEAD: The Civil Service Commission, together with the Metropolitan Life Insurance Company, administers the Federal Employees Group Life Insurance program. With 4,000,000 covered lives we can claim to have full credibility. FEGLI rates were recently lowered 25% primarily as a result of a sharp decrease in expected mortality since 1974.

FEGLI mortality had followed the general mortality trend from 1940 through 1974 – a drop of 1/2% to 1% a year. The 1974 experience was 95% of the basic rates then being used which covered 1965–1968. In 1975, however, actual experience dropped to 88% of expected and in 1976 to 83% of expected. Preliminary results show that 1977 was below 80% of expected.

The mortality reduction was observed for both sexes at all ages and for both employees and retirees. Comparison with other national data affirms that there has been a sharp drop in mortality since 1974. The Society of Actuaries report on ordinary insurance mortality, for instance, shows a drop of over 8% between 1974 and 1976. Various people have guessed that this reduction is primarily attributible to increased prevention of heart disease and lower speed limits but there is as yet no complete answer.

Another aspect of FEGLI that is of interest is the new optional insurance program proposed to Congress. This would allow all covered employees to elect from one to five times salary under an employee-pay-all option. The proposal will be considered by Congress in 1979.

Anyone wanting a copy of the recent FEGLI valuation can obtain it from me at room 4303, Office of the Actuary, Civil Service Commission, 1900 and E Streets, N.W., Washington, D.C.   20415

MR. THEODORE W. GARRISON: At Benefit Trust Life mortality rates vary by
area based on the 1970 Population statistics – White Male. We are uncer-
tain of the causes of the variations in mortality, but we believe they
exist just as mortality varies by country in Europe (lower in Scandinavian
countries, higher in Southern Europe). Possible explanations are high
Scandinavian populations in some areas of the country, environmental dif-
ferences, and differences in dietary and living habits.

We do not believe our own company experience is credible, but we have
tested our experience against the population data and have found an ex-
cellent correlation. The positive and negative adjustments to standard
mortality are as great as 20%.

Survey for Society of Actuaries Fall 1978 Meeting

Concurrent Session - Group Life Insurance

The most recent Society of Actuaries study of Group Insurance mortality is contained in the 1975 Reports volume of the Transactions of the Society of Actuaries. A number of the questions in the following survey are directed to determining your opinion of the appropriateness of this data for setting life insurance rates for employer-sponsored group plans.

Section A (Small Groups):

(All of the questions in this section relate to groups that normally have their rates and any experience refunds established independent of their own experience - typically smaller groups.)

1) Do you believe that the mortality experience indicated in the most recent Reports represents an appropriate rate setting basis for group life insurance for such groups?

/15/ Yes   / 3/ Generally, Yes, but   / 5/ No
                              would note exceptions

Exceptions or comments: "Our rates based on amounts of ins...level and slope is different". "Competitive problems on certain groups (e.g., high female, low age) when using 1975 Reports". "Lack of IBNR and waiver set at 75% causes distortions". "Companies appear to be misusing data by not: (1) using only sex distinct data, or (2) adjusting the sex - unknown data to reflect female exposures in the particular industry".

2) Has your own company's group life experience for small groups confirmed that of the Society Study with respect to Mortality rates by:

	Yes	Generally, Yes (with exceptions)	No	No Opinion
Age	/ 3/	/ 3/	/ 1/	/17/
Sex	/ 2/	/ 3/	/ 2/	/17/
Industry	/ 1/	/ 3/	/ 0/	/20/

Exceptions or comments: _____
"Age: Reports have different slope, sex: male/female differential not as large." "Female/male ratio of 55%"

3) For groups which do not have their rates based, either in part or fully on their own experience, which of the following would describe your Company's utilization of the Society's published mortality results?

/ 3/ The published Society of Actuaries data is the exclusive basis for rate setting.

/ 9 / The published results are modified, based on company experience.

/ 11/ The published results are modified, based on judgment.

/ 7 / The published results are not utilized.

Comments: "Published results only used for industry discounts."
            "Level of rates – our experience, slope by age/sex – SOA
            Experience, industry – SOA with judgment"

4) For groups that you are willing to accept and for which <u>rates are es-tablished independent of their own experience</u>, at what level of ex-pected experience do you reflect anticipated favorable or unfavorable mortality for a particular industry in the rate level?

a) Lower than Standard Mortality Anticipated		b) Higher than Standard Mortality Anticipated
/ 6 /	0-7% deviation from Standard	/ 5 /
/ 8 /	8-12% deviation from Standard	/10 /
/ 2 /	13-17% deviation from Standard	/ 2 /
/ 1 /	18-22% deviation from Standard	/ 2 /
/ 1 /	23%+ deviation from Standard	/ 0 /
/ 4 /	Other basis	/ 6 /

Section B (Large Groups):

(All of the questions in this section relate to groups that normally have their rates and any experience refunds based, either in part or fully on their own experience – typically larger groups.)

1) For larger groups, do you believe that the mortality experience in the Study is indicative of the average experience to be expected of such groups with respect to:

	Yes	Generally Yes (with exceptions)	No	No Opinion
Age	/10/	/ 6/	/ 1/	/ 7/
Sex	/10/	/ 5/	/ 1/	/ 8/
Industry	/ 6/	/ 9/	/ 0/	/ 9/

Exceptions or comments: "Have experienced for given cases that mortality experience can be unfavorable for long periods of time." "Over the long trend, yes. In the short trend experience is affected by average size of claims presented."

2a) Up to what exposure level do you exclude consideration of prior experience in the determination of group life insurance rates? Lives: 50-1000, Life Years: 500-5,000; Expected Deaths: 5

 b) At what exposure level do you apply 50% credibility to prior experience in the determination of group life insurance rates? _____

 c) At what exposure level do you apply 100% credibility to prior experience in the determination of group life insurance rates? Lives: 500-1000, Life Years: 3,000-100,000; Expected Deaths: 67-250;   Never (3)

 d) Is the credibility factor applied to:

$\underline{/17/}$ ratio of claims to premium, or $\underline{/5/}$ ratio of deaths to exposures?

3) In recent years, alternate funding approaches have become more popular. Of the following approaches – extended grace period, retrospective rate agreement, minimum premiums, pure Administrative Services Only (ASO), ASO with stop-loss agreement, or other arrangement (please describe) – which are most commonly offered, with respect to experience-rated life insurance coverages, to existing policyholders by your Company?

. . . most common Retrospective Rate Agreement (17)

. . . second most common Extended Grace Period (14)

Others: ASO w/ Stop Loss (1), Cost-Plus (1)

How would you characterize the frequency of such offerings by your company?

$\underline{/3/}$ Never $\underline{/14/}$ Occasionally $\underline{/7/}$ Often

Section C (Experience Refunds):

(All of the questions in this section relate to groups for which actual life insurance experience will be recognized in determination of the group's experience refund.)

1) What procedures or combination of procedures are used to limit experience fund deficits to a manageable level for life insurance coverages? (Check as many as are applicable):

/23/ Pooling of large individual life claims
/ 9/ Pooling of excessive total life claims
/10/ Credibility calculation for charged life claims
/ 4/ Aggregate deficit limitation
/ / Other (Please describe): Negotiated Deficit Forgiveness
    (2), Contingency Reserve (2), Catastrophic Loss Provision
    (1)

2) For plans with an experience fund, do you hold your books open beyond
    the anniversary date to record unreported claims?

    / 4/ No
    / 5/ Yes, but generally not more than 1 month
    /13/ Yes, generally between 1 and 2 months
    / 3/ Yes, generally 2+ months

3) a) What proportion of life insurance premium normally should be
        established as a reserve for unreported death claims?

        /16/ 0-7% of premium   / 6/ 8-12% of premium

        / 1/ 13-17% of premium   / 0/ 18-22% of premium

                    / 0/ 23+% of premium

    b) What proportion of life insurance premium normally should be es-
        tablished as a reserve for unreported waiver of premium claims?
        (Assume the waiver benefit provides lifetime continuation of in-
        surance after disability of at least 9 months for insureds disabled
        prior to age 60).

        / 6/0-7% of premium   /11/8-12% of premium

        / 3/13-17% of premium   / 2/18-22% of premium

                    / 0/ 23+% of premium

4) Is it your general practice to credit established Waiver of Premium
    reserves to the experience fund in the event of recovery from disability?

              /24/ Yes   / 1/ No

Please indicate the amount of your Company's 1977 Group Life Insurance
Premium:

        / 0/ $0-$1,000,000   / 1/ $1,000,000-$5,000,000

        / 6/ $5,000,000-$15,000,000   / 7/ $15,000,000-$50,000,000

        / 5/ $50,000,000-$100,000,000   / 6/ $100,000,000+

    Company Name (Optional) _____