

The Newsletter of the
Society of Actuaries

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THE Actuary

Small-group renewal rating – companies must become more active

by Drew S. Davidoff

Increasingly keen competition for small-group medical business has caused many carriers – both life/health insurance companies and Blue Cross/Blue Shield Plans – to drastically alter their approaches to renewal rating of small-group business.

Whereas I tend to define "small group" business as under 50 lives, among various insurance carriers the small-group market segment ranges from under 10 lives to under 200 or more lives. While portions of this article apply to whatever definition of small groups a company has, it is especially geared toward the smaller-sized groups of under 50 lives.

In the past, many companies – particularly Blue Cross/Blue Shield Plans – treated small-group business as a single risk pool, with the same set of rates (employee-dependent or single-family) applying to all groups, regardless of their age-sex composition, morbidity experience, or new business vs. renewal status. In the case of life/health insurance companies, geographic factors, as well as age and sex factors, were typically applied. This approach to rating reflected the six basic rating principles: adequacy, reasonableness, competitiveness, equity, coordination with operations, and simplicity. However, simplicity was given far more weight than equity.

Built into this approach is the inherent disadvantage that each year the better-risk groups will tend to find coverage elsewhere, while the

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Tests for actuarial soundness for OASDI and HI

by John C. Wilkin

The 1989 Annual Report of the Board of Trustees of the U.S. Federal Old-Age, Survivors, and Disability Insurance (OASDI) Trust Funds (usually referred to as the 1989 OASDI Trustees Report) was released on April 24. Notably, the Board of Trustees removed the concept of "close actuarial balance" from the Report over the objections of Chief Actuary Harry C. Ballantyne. This is the first time that the Chief Actuary of the Social Security Administration has attached qualifying language to the Statement of Actuarial Opinion since it was made a part of the annual reports in 1981 (which was accomplished largely through the efforts of the then Chief Actuary, Dwight Bartlett).

The trustees justify their action by stating that they do "not want to put undue emphasis on the concept of 'close actuarial balance' by continuing to report on whether the actuarial balance falls within an arbitrary range of values" and that the test "might inappropriately influence the decision as to whether and when changes in the program's financing

or benefit provisions are needed in the future."

Ballantyne (in a footnote printed in the Report) stated his belief "that 'close actuarial balance' is a valid concept, that it is generally accepted by the actuarial profession in evaluating the actuarial status of the OASDI program, and that it should be included in the report, continuing the practice in effect since the late 1950s" and that if "the concept were continued this year, it would show (using the alternative II-B assumptions) that...the combined OASDI program (deficit equal to 5.1% of its cost rate) is just barely out of close actuarial balance." In his Statement of Actuarial Opinion (attached to the Report), Ballantyne urges the trustees to reconsider their decision.

These two statements typify two schools of thought that have been developing over the last few years. One school wants a stronger test – which would be generally accepted by the actuarial profession – that could be used to determine the actuarial

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THE Actuary

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Actuarial soundness cont'd

status of the OASDI and Health Insurance (HI) programs. The other school wants to eliminate the test.

The controversy surrounding the test has been fueled both by confusion over the traditional long-range test of close actuarial balance and by its weakness in dealing relevantly with the short-range financial situation. (There is no short-range test, other than the implied test that the funds should have positive balances.) The confusion over the long-range test stems from the changes made in the test through time and by the differences in the test as applied to the OASDI and HI programs. Because the long-range test is the only test, its inability to deal with the short-range financing situation is seen by some as evidence that the test is flawed.

The solution to this situation is a separate short-range test. Many believe that the lack of a short-range test contributed to the conditions in which the financial crises of the OASDI program that preceded both the 1977 and the 1983 amendments were allowed to develop. Also, the lack of a short-range test or a target trust-fund level leaves us with little guidance on the appropriateness of the large fund accumulation taking place in the OASDI trust funds.

Well before the 1989 OASDI Trustees Report was released, the SOA Committee on Social Insurance (following the suggestion of Bob Berin, the SOA Vice President who oversees the committee) had been debating the issue. The committee strongly agrees with Ballantyne's statement and, in fact, believes that not only should the old test be continued but also that it should be strengthened.

Currently, the committee has joined forces with the Committee on Social Insurance of the American Academy of Actuaries, chaired by Bob Myers. The committees are looking into a stronger test of actuarial soundness that would be generally accepted by the entire actuarial profession. The committees plan on making a public expression of actuarial opinion on their findings.

The committees see the need for two tests:

- a short-range test for minimum funding requirements to assure solvency (to state when immediate action is necessary), and
- a long-range test for close actuarial balance (to give an early warning

that changes will have to be made, even though they may not be effective for many years into the future).

Members of the committees generally agree that the short-range test should not address any aspects of the financing philosophy other than solvency. Thus, the committees would like the test to avoid involving whether or not the system should be financed on a pay-as-you-go basis or on some advanced-funding basis (to level out tax rates, to provide for intergenerational equity, or for any other reason). As such, no test for a maximum trust-fund size would be included in the short-range test.

The committees offer the following tests for determining the actuarial status of the OASI, DI, and HI trust funds:

- (1) A trust fund will be considered to meet minimum short-range contingency-reserve funding requirements if, over the first five years of the projection period, the fund ratio is projected to remain above 50%; or, if the fund ratio is currently below 50%, to increase to above and then remain above 50% and, in addition, be able to meet all obligations when due.
- (2) A trust fund will be considered in long-range close actuarial balance if the 75-year income rate is between 95% and 105% of the 75-year cost rate.

The fund ratio is defined as the assets of a fund at the beginning of the year expressed as a percentage of the outgo during the year. The income rate for each year is defined as all noninterest income to a trust fund during the year expressed as a percentage of the year's taxable payroll, while the cost rate is defined as the total outgo from a trust fund during the year plus an amount to attain and/or maintain the fund ratio at a particular target level, all expressed as a percent of the year's taxable payroll.

The committees recommend a target fund ratio of 100%, which is judged to provide an appropriate level of contingency reserves. Although amounts held in excess of the 100% fund ratio level improve the financial strength of the trust fund, they are not necessary for the financing of the programs to be considered actuarially sound.

Although there is more than one acceptable method of combining the 75 single-year rates in the projection period into a single 75-year rate in

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Actuarial soundness cont'd

order to determine the actuarial balance, the method used should take into account interest earnings of the trust funds, the starting fund balance, and the target fund ratio.

One proposed method for combining the single-year rates is to divide the present value of the numerators (e.g., the dollar amounts of all years' incomes) by the present value of the denominators (i.e., the taxable payrolls). A second proposed method is to determine the arithmetic average of the 75 single-year rates. The present value method was used in the most recent OASDI Trustees Report, while the average method was used in the most recent HI Trustees Report.

Because the committees' goal is to arrive at a test for actuarial soundness that is generally accepted by the actuarial profession, we would be interested in comments on the proposed tests. It may be that more than one test would be generally accepted. We believe, however, that the test will be more effective the more widespread its support and that, once adopted, it should not be changed without a compelling reason.

John C. Wilkin, formerly with the Social Security Administration, is an Actuary with Actuarial Research Corporation. He is Chairperson of the SOA Committee on Social Insurance.

SOA Annual Meeting

Plan on joining more than 1,200 actuaries from across the country at this year's SOA Annual Meeting October 22-25 at the Marriott Marquis Hotel in New York City. Anyone who has not received the preliminary program can obtain a copy by contacting the Society Meeting Department at (312) 706-3540.

To plan ahead, below is a list of dates, locations and topics for the 1990 SOA Spring Meetings.

April 5-6, 1990 Dallas
Health/Pension

April 30-May 1, 1990 Hartford
Product Development/
Financial Reporting

June 14-15, 1990 San Francisco
Financial Reporting/
Product Development

Editorial**Refocusing our attention to HIV infection**

by Daniel F. Case

The number of AIDS cases reported in the United States during the first 26 weeks of 1989 was up 12% from the corresponding 1988 number. While this increase is much lower than the year-to-year increases of over 100% observed earlier in the HIV epidemic, we cannot expect the incidence of reported AIDS cases to peak within the next year or so. In early 1988 there was a bulge in reported cases, because the Centers for Disease Control (CDC) had broadened the surveillance definition of AIDS. Many cases that did not meet the old, narrower definition were counted for the first time. This reporting bulge, which lasted from late 1987 well into 1988, is still affecting the current period-to-period ratios of reported cases.

In June 1989 the U.S. General Accounting Office (GAO) issued the report, "AIDS Forecasting — Undercount of Cases and Lack of Key Data Weaken Existing Estimates." The report describes adjustments that the GAO made to 11 forecasts by various individuals or organizations (including two forecasts by the CDC). The GAO's adjustments reflected various undercounts (net of overcounts) inherent in the AIDS surveillance data that all forecasters used. In reviewing the CDC's 1988 (Charlottesville) forecast, the GAO adjusted the CDC's best estimate for cumulative cases through 1991 from 285,000 to something in the range of about 325,000 to 360,000.

These GAO adjustments do not mean that we should expect the impact of HIV infection to be significantly more severe than already anticipated. The GAO's adjustments reflect fatal HIV-related illnesses that have been occurring and will continue to occur but are not included in the CDC's count of AIDS cases. These noncounted illnesses include: (1) fatal HIV-related illnesses that are not included in the CDC's definition of "AIDS" for surveillance purposes, (2) illnesses of types included in the CDC's definition, but uncounted

because they were diagnosed as AIDS without the use of CDC-required diagnostic tests, and (3) illnesses acceptably diagnosed as AIDS but never reported to the CDC. The GAO described a fourth type of undercount, consisting of illnesses meeting the CDC definition but never diagnosed. The GAO made no adjustment for this last undercount, because it found no empirical data relating to the degree of undercount. In adjusting the CDC's 1988 forecast the GAO noted that the CDC had itself made adjustments for some types of undercount, but not necessarily large enough adjustments.

The main lesson from the GAO report may be that the impact of the HIV epidemic that the nation has been feeling and will continue to feel is greater than the impact previously identified as related to HIV. Certainly, the insurance business is aware that it has probably not been identifying all HIV-related claims. In estimating the past and future impact of the HIV epidemic on overall claim costs, some provision for undercounting should be made.

In addition to discussing undercount problems overall, the GAO report discusses undercounts by transmission category (e.g., heterosexual). It also discusses various trends, such as trends in reporting delays and "hidden" trends in transmission categories. These are worth careful study.

In some respects the forecasting, or projecting, of the financial impact of the HIV epidemic is becoming less difficult. Information on the incidence of AIDS cases, on the length of time from infection (or from test positivity) to AIDS, and on the prevalence of HIV infection in various population segments continues to accumulate. On the other hand, there are problems that continue to make forecasting quite difficult. The average length of time from infection to AIDS may differ from what has been observed among a few relatively small groups of individuals, and it may change over time

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HIV infection cont'd

as the epidemic moves through various population segments. Not enough is known about the current prevalence of infection, the prevalence of various risk behaviors, and the probabilities of HIV transmission associated with those behaviors and with various stages of the progression of HIV disease in infected individuals. Also, and we may hope very significantly, various therapies are beginning to lengthen the survival of persons with AIDS (PWAs) and to defer the onset of AIDS among some infected persons.

With the increasing use of drugs to fight AIDS and HIV infection, the financial implications for the nation's healthcare systems become increasingly significant. Actuaries and others are grappling with these implications and with the overall problem of caring for PWAs.

It is important to get better estimates of the prevalence of HIV infection, both to improve the accuracy of projections of AIDS cases and to get a clearer picture of the size of the healthcare needs of HIV-infected persons who do not have AIDS. The importance of HIV-antibody testing for purposes of prevalence estimation, control of the spread of infection, and (relatively newly) treatment of infected individuals is becoming more and more widely recognized. Surveys are being conducted in various population segments. A national cross-section survey with reasonably unbiased results may be difficult or impossible to accomplish.

Life and health insurance companies have tested a great many individuals, many or most of whom do not belong to the population segments being tested by others. Laboratories testing for insurers have been making public some of the resulting data. These data benefit both the insurance business and the public at large. The more such data can be released (subject, of course, to strict confidentiality controls), the greater will be the benefit.

Renewal rating cont'd

poorer-risk groups will stay. This adverse selection process leads to the classic "assessment spiral" of yearly rate increases. Once a company reaches this stage, not only is it difficult to make money, it becomes difficult to break even on this block of business, no matter how high future rates are set.

The solutions

Over the past five to 10 years, companies have responded to this problem in various ways, including all or some of the following (where not previously used):

- Demographic rating
- Experience analysis
- Medical underwriting

Demographic rating, including at least age and sex rating, enables a company to determine rates in such a way that groups with more favorable risk characteristics (i.e., a lower average age or a higher percentage of males) get lower rates, while those with less favorable risk characteristics get higher rates. The rates may either be locked in for a year or vary month to month as people enter and leave the group.

Experience analysis can take several forms. One form is to apply the company's experience rating formula, typically applicable to large groups, to small groups as well. Over the past 10 years, the size of the group to which the experience rating formula applies has been declining. Although the smallest group to which the experience rating formula applies

now is typically 50 lives, some companies use the formula below 50 lives. Although a credibility factor of less than 100% is normally applied to a group's own experience, and this result is then coupled with some overall pooled experience, the key is that the group's own experience counts to some degree in determining future rates. The tendency — largely marketing-driven — has been to give more credibility at a given number of lives than is truly warranted based on pure statistical considerations.

Another form of experience rating is known as "tiered rating." Under this approach, an overall rate (perhaps demographically adjusted) is determined for the entire small-group pool, and then each group is assigned to a certain tier — either above or below the standard level — based upon its own experience. A loss ratio approach is the most common for assigning groups to specific tiers. Although companies use differing numbers of tiers, three to six tiers is fairly standard. The difference in rates from the lowest to the highest tier can be as low as 30% or as high as 100% or more. Often, carriers limit the number of tiers by which a group can move — either upward or downward — each year. Although many companies will move a group only one tier per year, others will move groups more than one tier. Some companies limit downward moves (to a lower rate level) more narrowly than upward moves.

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Seminars on exams

Georgia State University will sponsor examination preparation seminars between October 2 and November 3 on the following courses:

110 140 162
120 150 165
130 151 EA2
135 160 210

For further information, contact Robert W. Batten at his *Yearbook* address, or by telephone at (404) 651-2736.

* * *

The University of Waterloo will conduct examination preparation seminars between September 27 and

November 4 in Waterloo and St. Louis on the following courses:

140 161 220 361 441 562
150 162 320 362 445
151 165 342 364 522
160 210 343 440 542

For further information, contact F. G. Reynolds at Box 773, Waterloo, Ontario, N2L 3C1, or by telephone at (519) 886-5232.

* * *

The University of Toronto will conduct examination preparation seminars for the November exam period in various locations on Courses 120, 130, 135, 140 and 150. For more information, contact Professor S. Broverman at his *Yearbook* address.

Renewal rating cont'd

Under a different approach to tiered rating, some companies use diagnostic cost groupings. Here a company analyzes the diagnoses of the claimants in the group in one year, using this as a predictor of future experience, and then assigns the group to a tier based on the diagnoses. Although significant administrative costs are associated with this method, some companies believe it to be cost-effective.

With regard to medical underwriting, it has become fairly common among carriers to increase the number of lives above which a group will be written on a guaranteed issue basis. Thus, by requiring medical underwriting on more groups, a carrier's morbidity experience should improve because more "bad" groups will be either declined or rated up. Some companies now allow a group to be medically underwritten upon renewal to gain a more favorable rate.

I have described three major approaches — demographic rating, experience analysis, medical underwriting — that carriers have implemented to better manage their small-group pools. Other methods also have been tried.

Summary

Whereas life/health insurance companies tended to lead the movement toward a more active role in rating small groups, many Blue Cross/Blue Shield Plans have also made substantial changes. This is a significant departure from the Blues' long tradition of "community rating," which treated all groups the same.

With regard to the six rating principles mentioned earlier, companies clearly are making a concerted effort to give more weight to "equity" and less weight to "simplicity." Any company involved in small group will need to manage its pools in a more active fashion than would have been the norm five or 10 years ago.

The message is clear: Companies will have to become more active in managing their small-group pools, or they will not survive in the small-group market.

Drew S. Davidoff is a consulting actuary with Milliman & Robertson, Inc. He specializes in health insurance consulting and has worked extensively with Blue Cross/Blue Shield Plans, life/health insurance companies, and benefit plan sponsors.

MEC-ing sense out of TAMRA

Features Editor Deborah Poppel recently spoke with Cary Lakenbach, Vice President and Actuary at American Financial Systems (AFS), about TAMRA: the U.S. Technical and Miscellaneous Revenue Act of 1988.

Lakenbach has worked in several insurance companies, most recently as head of life insurance product development at Connecticut Mutual. His current company, AFS, is a consulting firm focusing on the nonqualified benefits marketplace.

Poppel: Why was TAMRA, the recent tax law, passed?

Lakenbach: The law was meant to limit the use of life insurance as an investment vehicle. It was especially targeted to deter the use of single-premium life insurance as a vehicle to avoid taxes on income taken from an insurance contract.

Poppel: TAMRA created a beast called a "Modified Endowment Contract (MEC)." What is a MEC, and how is it different from all other contracts?

Lakenbach: A MEC is a life insurance contract where, to put it simply, the premiums paid in exceed the premiums that would be necessary to pay up the contract in seven years or less.

Poppel: How is a MEC taxed differently from a non-MEC?

Lakenbach: There are three primary areas where an MEC is taxed differently from a non-MEC. First, distributions are assumed to be made out of income first, then principal. Consequently, taxation occurs earlier.

Second, loans are considered distributions, including loans used to pay premiums.

Third, distributions made before the policyholder is 59.5 years old are subject to a 10% penalty tax. This penalty tax never disappears for corporate policyholders, except under very limited circumstances.

Poppel: Are there any circumstances when purchasing a MEC is appropriate for a customer to do?

Lakenbach: There's not necessarily anything wrong with owning a MEC, particularly within the corporate marketplace. MECs are treated like non-MECs in two respects: Death proceeds are still income tax free, and the inside build-up continues

unabated. It's when you get distributions that the treatment is radically different.

I like to think of a MEC as a "cash-rich" contract. One reason that a corporation would want to buy a cash-rich contract is that it has a quicker positive impact on its income and balance sheets. Said another way, the more cash-rich the contract is, the less of the cash is going out to fund insurance. Usually, the corporation doesn't care about access to the cash — it has other fully deductible credit lines or other sources of capital.

Poppel: How does a contract become a MEC?

Lakenbach: A contract becomes a MEC if it fails the "7-pay test." This test compares the premiums paid into a specific policy to "7-pay premiums" defined in TAMRA. If the accumulated policy premiums in any of the first seven policy years exceed the accumulated "7-pay premiums," the policy is a MEC.

Poppel: What policies are subject to TAMRA and must pass the 7-pay test?

Lakenbach: Basically, policies entered into after June 20, 1988, are subject to TAMRA. Policies issued before June 21, 1988, are grandfathered and are therefore not subject to the 7-pay test.

Poppel: If a policy is grandfathered, is it never subject to the 7-pay test?

Lakenbach: A policy will lose its grandfathering if it is "materially changed."

Poppel: What is a material change?

Lakenbach: Pretty much what it sounds like — a material change in the provisions of a contract. The most common kind of material change is an increase in benefits, although the law defines certain increases that are not considered material changes. If there is a material change, a new 7-pay test period begins, whether or not the contract changed was grandfathered. Keep in mind that even if a policy is subject to the 7-pay test, it will not necessarily become a MEC.

Poppel: Could a material change actually prevent a contract from becoming a MEC? For example, if a term rider is added to a contract the year before it is expected to fail the 7-pay test, does

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TAMRA cont'd

the 7-pay clock start again with a higher 7-pay premium?

Lakenbach: I think the addition of a term rider at an appropriate point in time may well prevent a contract from becoming a MEC. Material change may be your friend.

Poppel: *Can a policy be materially changed without a customer's knowledge?*

Lakenbach: Absolutely.

Poppel: *Under what circumstances would that happen?*

Lakenbach: There are situations where you can wind up having face amount increases that result from actions taken several years prior. If those increases result from earnings on "unnecessary premiums" (premiums in excess of those necessary to fund the initial death benefit), they are considered material changes.

Poppel: *Other than single premium policies, what contracts are likely to become MECs?*

Lakenbach: Two-premium policies. Seriously, universal life policies where you pay out the cash value as well as the face amount are at risk. Also, policies with large premiums going into paid-up additions riders.

Poppel: *Does TAMRA essentially ring the death knell of paid-up additions riders?*

Lakenbach: That sounds like a question a news reporter would ask a crime suspect! I think that paid-up additions riders serve a valuable purpose. They actually can help a policy avoid becoming a MEC, because their flexibility lets you control the amount of money you pay into a contract. In the corporate marketplace, a lot of the benefits are salary-related. A paid-up additions rider allows the insurance proceeds to track the benefit more efficiently than in the past.

My view is that paid-up additions riders will continue to be popular. A policy may be judiciously structured to include such riders while still staying clear of MEC status.

Poppel: *Are companies still selling single-premium plans?*

Lakenbach: Many are. Some are adding certain clever features to make sure they are in compliance with TAMRA.

Poppel: *For example?*

Lakenbach: For example, term riders where there is an intent, though perhaps not a contractual agreement, to take the rider off after seven years.

Poppel: *How does that help? Don't you need to recalculate the 7-pay test at the lower amount, once the term rider is dropped?*

Lakenbach: There is some controversy in this area. One school says that reductions after the first seven years don't require any sort of look-back treatment.

Poppel: *If companies come up with clever schemes to get around TAMRA, won't that rile the IRS and put the remaining bastions of favorable tax treatment in jeopardy?*

Lakenbach: I'm not sure that I agree with that. After all, the law is essentially saying that to be treated as you always have been treated for tax purposes, you now need to have a certain amount of insurance in your contract, relative to the premiums you've put in. By designing a term rider like the one above, you're in effect saying, "Okay law, this is what you want; this is what I will do." I don't think there is anything inappropriate about this treatment.

Poppel: *In the companies you've worked with, does the responsibility for TAMRA compliance and administration generally reside in any particular department?*

Lakenbach: Many companies have teams of actuaries, administrative personnel and lawyers who address these issues.

Poppel: *Who is responsible for protecting our customers from buying or creating MECs? The pricing actuary? The agent? The customer? The customer's tax attorney?*

Lakenbach: There are responsibilities in several different areas. Surely, attorneys who are specialists in tax law should disseminate opinions to those in the company who are likely to be involved. The product development actuaries, who I strongly believe should be experts in the marketplaces in which their products are sold, have to be very knowledgeable as to the provisions of the act. It's appropriate to notify the clients of the potential impact of TAMRA on the policy they purchased. The agents need to understand the law well enough to discuss it with their clients.

It's probably not a bad idea for a company to produce a pamphlet describing the provisions of the act in terms that their clients can understand. Certainly, such a pamphlet is a marketing opportunity at the same time that it is an informational and educational guide.

Poppel: *What needs to happen at point of sale?*

Lakenbach: A client should receive disclosure concerning the tax implications of the type of policy purchased.

Poppel: *Is mere disclosure enough? Should the client sign off on the tax status of the policy?*

Lakenbach: Not necessarily. You have to draw the line somewhere. There are other issues, such as dividends not being guaranteed, that are disclosed all over the place, but no sign-off is required. Sometimes companies bend over backward to be careful but still get into trouble. I will say that I've seen more companies than not moving in the direction of requiring the disclosure to be signed.

Poppel: *What needs to happen when a contractual change is proposed?*

Lakenbach: Again, disclosure is warranted, especially if the contractual change will affect the tax status of a grandfathered policy.

Poppel: *Should companies design products so that they will never become MECs?*

Lakenbach: I'm a strong believer in the use of components — base policy, paid-up additions riders, term riders, dividend options, and such — to form a precise insurance plan to meet the purchaser's objectives. Thus, some combinations of these components will result in MECs and others will not.

Poppel: *Doesn't that require some level of sophistication in your market? Some companies' customers and agents may not want to make those decisions and may rather buy a product off the shelf.*

Lakenbach: That's true; for some markets it may not be important. Nevertheless, if the market is at all sophisticated, the use of components allows it to structure a solution to its needs that doesn't cost any more than it has to. Some products, such as a typical whole life policy, will never become MECs.

Poppel: *In cases where TAMRA is unclear on a topic, what should companies do?*

Lakenbach: TAMRA, as with most laws, doesn't clearly address every issue, so it's natural for questions to come up. Different intelligent people will have different rational interpretations of the ambiguous areas. Ultimately, some of the issues won't be

TAMRA cont'd

resolved until regulations are written by the Treasury.

In these instances, one of our client companies asks three sensible questions. First, do we have to make a decision on this issue? If we do, is our position a reasonable one? And finally, what is the risk — what's the worst that can happen if we take this approach? If the answers to these questions suggest an answer is needed and the risk reasonable, then go ahead.

Poppel: What new legislation or clarifications to existing legislation do you expect in the short and long term?

Lakenbach: One rumor floating around is that, partly because of the demand for more revenue, certain favored tax treatments of life insurance are at risk. One is the deductibility for corporations of the first \$50,000 of life insurance; another is the treatment of any distributions from a life insurance contract, whether or not it is a MEC. Last, although I don't hear much talk about this one, maybe because of fear, is the tax treatment of the inside build-up. I've heard there may be some major tax changes next year.

We have to deal with the law and the environment as it is now. If you're going to wait until everything has been settled, you'll never come out with products, and you'll never develop solutions to the client's current needs.

Summary outline

Ghislain Nadeau has published a summary outline for part I-542. For more information, write him at 195 Begin, St-Romuald, Quebec, Canada G6W 2W8, or call (416) 644-8096.

Correction

In the color insert to the July/August issue of *The Actuary*, there was an error in a photo caption identifying Robert Hoskins and Ken Clark. Clark is third from the left.

Book review

Text is pedagogically impeccable

by Jean Lemaire

Actuarial Mathematics by N. Bowers, H. Gerber, J. Hickman, D. Jones and C. Nesbitt. Published by the Society of Actuaries, 1986. 624 pages.

(Ed. Note: The following review is a condensation of a review that appeared in the April 1989 IAA Bulletin.)

The monumental new textbook, *Actuarial Mathematics*, published by the Society of Actuaries, has finally arrived after years of preparation by its five authors.

From a pedagogical point of view, the presentation of the book is impeccable. Interesting examples illustrate each new concept. Interpretations are provided for the most important formulas. Each chapter concludes with a lengthy series of exercises. The solutions of most exercises, without derivation, are to be found in an appendix. Among the seven appendices, appendix 4 is especially noteworthy, since it presents a comprehensive survey of the international actuarial notation.

The major innovation introduced by the book is the totally probabilistic approach to the mathematics of life contingencies. This breakthrough is definitely not going to facilitate the task of actuarial students, but it is long overdue. It is best illustrated by the very first example in the life insurance chapter. Example 4.1 reads, "The density function of the time-until-death random variable is assumed to be uniform over the range (0, 80). At a given force of interest δ , calculate the net single premium, the variance and the 90th percentile of the claim random variable for a whole life insurance of unit amount issued to (x)."

A basic knowledge of financial mathematics is assumed at all times, as well as a solid background in undergraduate calculus and probability theory. A three-page appendix reminds the reader of the most common probability distributions and of some formulas from the calculus of finite

differences. Otherwise, many theorems from calculus and probability theory are routinely used without restatement. The reader should be prepared for a constant use of conditional expectations, moment-generating functions, integration by parts, etc. Quite often only the key steps of a mathematical derivation are provided, and some computation is required to "move from one line to the next."

The book does not cover the following:

- Stochastic interest rates — the interest rates used to convert future payments to a present value are considered deterministic at all times and are usually taken as constants.
- Estimation of parameters — for example, the construction of mortality tables.
- Computing methods — issues like the optimal organization of input data, simulation, and computation in actuarial models.

The study of chapters 3 to 10, 14 and 15 is required for all SOA students as preparation for their most important examination on life contingencies. Chapter 2 and chapters 11 to 13 cover the material of the examination on risk theory. Students of the Casualty Actuarial Society must study chapters 3 to 7 and chapter 9 for their Part 4 examination. Since very little of the material is specifically geared to the United States or Canada, the book could be adopted by other actuarial associations and non-American universities.

Chapter 1 introduces the economics of insurance, using utility theory. It serves as a background for the remainder of the book, but it is not essential, since utility theory is not used in the sequel.

Chapters 2, 11, 12, and 13 provide an excellent and modern introduction to risk theory, despite some important recent developments that had to be bypassed. Chapter 2 gives a welcome survey of important probabilistic concepts, presented in an insurance framework. Chapter 11 focuses on the

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Actions of the Board of Governors — May 17, 1989 — Vancouver, B.C.

by Anthony T. Spano

AIDS Reports. The Board approved the report of the Committee on HIV Research, on projected AIDS mortality rates for the U.S. general population, and the report of the Task Force on the Financial Implications of AIDS. The Board urged appropriate public relations and publications efforts for these reports.

Constitutional Amendment on College Credit. The Board finished setting procedures in connection with a proposed amendment to the Society's Constitution regarding credit based on a course taken at a college, university, or other educational institution. The amendment would prevent the Society's Board from allowing a student to obtain credit for material in the educational syllabus based on such a course rather than by Society

examination, unless the procedure has first been approved by a majority of the Fellows voting in a referendum.

Elimination of Secretary and Treasurer Positions. The Board approved a resolution proposing amendments to the Society's Constitution that would eliminate the Secretary and Treasurer positions following the Society's 1990 Annual Meeting. The Secretary and Treasurer functions would then be assigned to two of the Society's Vice Presidents.

Society Meeting Dates and Sites. The Board approved guidelines for selecting Society meeting dates and sites that were prepared by a task force of the Continuing Education Policy Committee. The Board also approved a proposal to hold an upcoming Society spring meeting in late June or early July at a resort location to allow members to schedule family vacations around the meeting.

Expansion of Publications Services. The Board ratified actions taken by the Society's Executive Committee on March 9 and 10, 1989, to expand the Society's publications services. The expansion would involve publishing special volumes of the *Record* as necessary, expanding the *Reports* volume of the *Transactions* to include reports of committees other than experience studies committees, and publishing a comprehensive annual index of material published by the Society.

Waiver of Dues for Child Rearing. The Board extended from three to five the maximum number of years for which membership dues would be waived on account of child rearing.

Anthony T. Spano, SOA Secretary, is an Actuary with the American Council of Life Insurance.

Impeccable text cont'd

computation of the aggregate claims distribution. The surplus process is analyzed in chapter 12. Some interesting applications of risk theory are outlined in chapter 13. How to compute net stop-loss premiums using the recursive formula of chapter 12 is shown, along with how stop-loss reinsurance is linked to a dividend formula in group insurance.

Chapter 3 introduces the basic random variables that will be used throughout the text. These include the survival function, the (continuous) time until death for a person aged x , the (discrete) curtate future lifetime, and the force of mortality. An illustrative mortality table, used in many exercises in the sequel, is presented and discussed.

Chapter 4 develops models for the most common insurances payable at the moment of death, including term, whole life and endowment. Classical variants are also presented. Chapter 5 focuses on similar developments for annuities. Some practitioners may regret the rather theoretical presentation of these and other chap-

ters. The continuous approach, based on integrals, is always presented before the discrete approach. Readers need to thoroughly study several chapters before getting acquainted with insurance practice.

Chapter 6 deals with net premiums and focuses on the financial loss random variable. This probabilistic approach allows the computation of not only net annual premiums, but also variances for the major contracts. The random variable "prospective future loss on a contract already in force" is investigated, in chapter 7, for both the continuous and the discrete case. The reserve is defined to be the expected value of this loss and is obtained for all usual types of policies.

Chapter 8 introduces multiple-life functions. In chapter 9 a single life is considered, but with multiple contingencies like withdrawal, retirement, death, and disability. The construction of multiple-decrement and associated single-decrement tables is applied to calculating actuarial present values of benefits and contributions for a participant in a pension plan in chapter 10.

Expenses are, at last, introduced in chapter 14. The individual model is

extended to incorporate acquisition and administrative expenses and accounting requirements. Nonforfeiture benefits and dividends are the subjects of chapter 15.

Chapters 16 through 19 develop special topics and are not included in examination material. They are nevertheless of extreme importance for practitioners. Chapter 16 computes actuarial present values, net and gross premiums, and net premium reserves for a wide variety of policies providing special annuity and insurance benefits. In chapter 17 elementary models for plans involving two lives are extended to a larger number of lives and to more complicated benefits. Chapter 18 provides a most welcome introduction to population theory. In chapter 19 aggregate models are applied to the evolution of retirement income benefits provided on a group basis. The major actuarial cost, or funding, methods for defined benefit plans are presented and analyzed.

Jean Lemaire is the Joseph Wharton Term Professor of Actuarial Science at The Wharton School of the University of Pennsylvania. He is Chairperson of ASTIN, the nonlife section of the International Actuarial Association (IAA). He is also Editor-in-Chief of the *IAA Bulletin*.

AIDS adjustments for modeling purposes

by Timothy F. Harris

With the release of the Cowell/Hoskins report and the subsequent Report of the Society of Actuaries Task Force on AIDS, it is not difficult to model the AIDS exposure that a company has on both inforce business and future sales.

However, two areas in particular remain unclear in the projection of a company's AIDS claims: adjustments for a company's level of underwriting and for the geographic distribution of its business. Comments here apply to both individual life and individual disability income forms of coverage.

The task force report contains modeled AIDS claims examples that use aggregate population data. An insurance company should be modeling using insured population data adjusted for the effects of underwriting.

Level of underwriting

Because of variations from company to company and from year to year, the above-mentioned reports do not cover adjustments that should be made to account for a company's level of underwriting.

To better analyze the issue, a company's business can be divided into the following subsets:

- 1) Pre-1984 issues – This represents business issued before widespread recognition of AIDS.
- 2) Post-1983 issues – This is further subdivided into tested and nontested business.

The pre-1984 issues will use the insured AIDS mortality projections, which will be described later, without adjustments because few potential insureds were knowledgeable about AIDS before 1984. Therefore, there was little antiselection. However, the issues addressed in adjusting the data to an insured population would still apply except for the adjustment made for transfusion-related AIDS cases. This insured AIDS mortality takes into account the elimination of certain AIDS cases such as IV drug abusers.

For the post-1983 issues, companies can expect to experience antiselection below the level at which they are testing for HIV. Therefore, the base insured AIDS mortality

projection should be adjusted by a factor greater than one for those untested policies. In addition, this factor will vary by the type of product sold. An insured who decides to select against a company will attempt to do so as cheaply and as soon as possible. Therefore, the highest loads for antiselection should apply to term life insurance and disability income coverage with short elimination periods. The lower loads for antiselection will apply to whole life insurance and disability income coverage with longer elimination periods.

For post-1983 issues that are tested for HIV, using data from reports on the accuracy of HIV testing, false positives can be expected in the area of .001% of the number that tested negative. These are potential insureds whom a company will reject and who might have otherwise been insured.

You also can expect false negatives of .8% of those who tested positive. These individuals were HIV positive and were not caught in the underwriting process. The percentage is higher, but the number is considerably lower than the false positives.

These rates assume highly accurate laboratory testing. These data also assume that the standard testing procedure is one ELISA test, which if positive, is repeated. If the results are again positive, a Western Blot test is given.

The estimated cost of these tests was quoted in 1987 at about \$10 for the two ELISA tests and at \$90 for a Western Blot test. The laboratory may package these and charge on a per test basis, not itemizing the number of Western Blot tests given.

Companies forced to use the T-cell test in the past can expect an extremely high number of false positives (2%) as defined previously and a very high number of false negatives (15%). However, no states now limit companies to this test.

The post-1983 business that was assumed to be non-HIV after testing negative will be affected by future exposure to HIV. To calculate this exposure requires the use of projected HIV infections as opposed to historical infection data. Future AIDS data are then used by year of issue to calculate the "force" of AIDS mortality that will

impact these once HIV-negative issues.

This is represented by the following diagram:

- Pre-1984 issues –
 - Insured population AIDS mortality
- Post-1983 issues –
 - Untested – Antiselection adjusted insured AIDS mortality
 - Tested – False negative AIDS claims
 - Non-HIV presently but subject to insured population type HIV exposure in future

Insured population adjustments

In projecting a company's AIDS mortality it is necessary to adjust from aggregate AIDS cases to insured-population AIDS cases by geographical area.

Included in the task force report was information on the AIDS model that was developed by Milliman & Robertson – to project a company's AIDS mortality. This model was recently supplemented by a table of adjustment factors by state called Geographic Influence Factors. These factors are used to weight the inforce or sales of an insurance company by state to arrive at the aggregate factors used in the AIDS model.

Table 1 shows a matrix that breaks out reported AIDS cases in the northeast region of the United States as defined by the Centers for Disease Control (CDC). It includes only those metropolitan statistical areas with population greater than one million.

The CDC limits the subdivision of their data in order to maintain confidentiality.

These data are subdivided by category of infection, the rows of the matrix, and by sexual preference category, the columns of the matrix.

The purpose of breaking the data down into these subcategories is to eliminate those AIDS cases not representative of an insured population. Except in the home service insurance business, all IV drug users can be eliminated. Hemophiliacs and transfusions on recent issues also can be eliminated since the blood supply is much safer now than in the past.

The Pattern II category, consisting of persons born in "Pattern II" countries, including those in Africa and the Caribbean, also should be dropped. The remaining three categories of infection are homosexual/bisexual, heterosexuals and undetermined.

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AIDS adjustments cont'd

In the homosexual/bisexual group, the male homosexual number can be weighted by some factor less than one since it is assumed that these individuals do not have the level of insurable interest expected from a heterosexual or bisexual.

A 50% adjustment of this category will be assumed. The entire number of bisexuals is included for weighting purposes, as are heterosexuals.

The undetermined category may include many males who later are assigned to the homosexual/bisexual category; however, they are included here without adjustment.

The female heterosexual category also may include women in high-risk professions that would cause them to be rejected for insurance coverage. However, they are included here without adjustment.

The lower portion of Table 1 shows the AIDS cases remaining after these adjustments. The Geographical Influence Factors (GIF) calculated by region as defined by the CDC are then shown in Table 2 both before and after the insured-population adjustments.

A GIF of 3.051 indicates that business sold or in force in the area defined should be weighted by this multiple before applying future projected AIDS claims that reflect an overall insured-population adjustment by a factor of 0.150/0.355, per Table 2.

These GIFs do not vary greatly with the percentage of homosexuals assumed to represent the insured population. The overall adjustment from aggregate AIDS cases to insured-population AIDS cases does, however, vary with this percentage.

These calculations were made using CDC data on the number of AIDS cases reported through December 31, 1988. For the purpose of calculating the GIFs, 1980 census data were used.

The calculations shown have been made by region as defined by the CDC, taking into account their confidentiality limitations. This type of geographical weighting also can be done on a state-by-state basis or even a city-by-city basis. There are, however, some limitations in this process because of CDC confidentiality restrictions.

Any attempt to make adjustments may be construed as arbitrary

without adequate facts or other supporting data. However, some attempt is better than none, and perhaps several attempts could be investigated to test the sensitivity of the model to these adjustments to the AIDS data.

Another approach would be to generate, for example, three sensitivity scenarios and then weight each scenario by the expected probability of its actual occurrence to get a composite set of adjusted data.

Timothy F. Harris is a Consulting Actuary with Milliman & Robertson.

Northeast Region SMSAs Greater Than 1,000,000 Reported AIDS Cases Through December 31, 1988 Includes: Buffalo, NY; Boston, MA; Nassau, NY; New York City, NY; Newark, NJ					
	Male Homosexual	Male Bisexual	Male Heterosexual	Female	Total
Homosexual/Bisexual	8,964	1,488			10,452
IV Drug Abuser			6,194	1,889	8,083
Homosexual/Bisexual	689	288			977
IV Drug Abuser			51	4	55
Hemophiliac			70	710	780
Heterosexual			421	123	544
Pattern II Country			164	106	270
Transfusion			599	239	838
Undetermined					
Total	9,653	1,776	7,499	3,071	21,999
After Described Adjustments to Possible Insured Population					
Homosexual/Bisexual	4,482	1,488			5,970
IV Drug Abuser					0
Homosexual/Bisexual					0
IV Drug Abuser					0
Hemophiliac					0
Heterosexual			70	710	780
Pattern II Country					0
Transfusion					0
Undetermined			599	239	838
Total	4,482	1,488	669	949	7,588

Reported AIDS Cases Through December 31, 1988 Compared to U.S. Population Figures From 1980 Census				
	(1) AIDS Cases	(2) Population (000)s	(3) Cases Per Thousand	(4) GIF (3)/Total (3)
Northeast Region	21,999	16,581	1.327	3.741
Central Region	5,541	25,032	0.221	0.624
West Region	16,201	20,937	0.774	2.182
South Region	11,205	16,613	0.674	1.902
Mid Atlantic Region	5,008	12,387	0.404	1.140
SMSAs <1,000,000	21,532	138,192	0.156	0.439
Total	81,486	229,742	0.355	1.000
AIDS Cases Adjusted to Represent Insured Population				
Northeast Region	7,588	16,581	0.458	3.051
Central Region	2,806	25,032	0.112	0.747
West Region	7,866	20,937	0.376	2.505
South Region	4,986	16,613	0.300	2.001
Mid Atlantic Region	2,427	12,387	0.196	1.306
SMSAs <1,000,000	8,785	138,192	0.064	0.424
Total	34,458	229,742	0.150	1.000

Book review

A fresh look at actuarial mathematics

by William B. Frye

Actuarial Mathematics, Proceedings of Symposia in Applied Mathematics, Volume 35, edited by Harry H. Panjer. Published by the American Mathematical Society, 1986. 127 pages.

This book reviews the thirty-fifth in a series, which began in 1947, of short survey courses designed to acquaint mathematicians with various topics in applied mathematics. The course on actuarial mathematics was conducted in Laramie, Wyoming, in August 1985. The proceedings of that meeting, as presented in this volume, include a preface by Harry Panjer, an introduction by James Hickman and seven papers.

The first paper, "Updating Life Contingencies" by James Hickman, describes the mathematics involved in calculating premiums and reserves. The loss variable is an integral part of the exposition, and its variance is used as a measure of risk.

The next paper, "Models in Risk Theory" by Harry Panjer, focuses on the various probability distributions available for modeling claim frequency. Compound distributions and mixed models are also examined. Stop-loss reinsurance is given as an application of the distribution of total claims.

"Loss Distributions," a paper by Stuart Klugman, considers the advantages of fitting claim distributions to a parametric model. Several methods of fitting are considered, and the advantages of one, the maximum likelihood method, are discussed.

Another paper, "Overview of Credibility Theory" by P. M. Kahn, explores various methods of determining the credibility factor, Z , in the basic equation: New estimate of claims = Z (actual claims) + $(1 - Z)$ (old estimate of claims).

Kahn studies various distributions of claim frequencies and uses a Bayesian approach to the problem, as well as the least-squares theory. He also provides a brief overview of recent developments in credibility theory.

The fifth paper, "A Survey of Graduation Theory" by Elias Shiu, introduces the concept of graduation of data and reviews three of the better-known graduation methods – Whittaker-Henderson, moving weighted average, and smooth-junction interpolation. The presentation emphasizes the use of linear algebra.

John Beekman's paper on "Actuarial Assumptions and Models for Social Security Projections" discusses factors used in making estimates for the Old-Age, Survivors, and Disability Insurance System (OASDI). In addition, Beekman examines the short-, medium- and long-range projections needed in managing the OASDI program. Among factors that must be projected are population distributions by age, sex and marital status, and effective taxable payroll. These estimates require demographic and economic assumptions. Several formulas used by the Social Security Administration are presented and discussed.

The final paper, "On the Performance of Pension Plans" by Cecil Nesbitt, discusses the benefit formulas used in the TIAA and CREF pension plans and the plans' performance with respect to the actual benefits paid out to various groups of retirees. Several tables are included in the paper. In addition, Nesbitt reviews the problem of loss of real value of vested benefits before they are received.

While actuaries were not the book's intended audience, the actuary who wants a fresh look at some basic topics of actuarial mathematics may find the book of interest. Also, an extensive bibliography at the end of each paper provides a rich source for a closer look at new developments in some familiar areas. This book accomplishes its purpose of acquainting mathematicians with actuarial mathematics and is recommended to any mathematician interested in beginning or continuing to build a knowledge of actuarial science.

William B. Frye is Assistant Professor in the Department of Mathematics, Ball State University.

Becoming an actuary in The Netherlands

by Ron van Oijen

The following information about actuarial education in The Netherlands is offered in response to the article, "Competition, communication, and cooperation" in *The Actuary* of March 1989.

There are two ways to become an actuary in The Netherlands. Both require study at the University of Amsterdam. The following is a short description of the two courses of study:

1) When you have finished your study at the V.W.O. (a comprehensive, pre-university school) and completed required courses at that school, including mathematics, you can enroll at the University of Amsterdam in the study-direction of actuarial science. The course of study usually takes four years (see accompanying sample study program).

During your course of study you can specialize in pensions, life insurance or casualty. If you successfully complete all the courses at the university, including the required exams, you receive a degree in actuarial science, and you also become a member of the Dutch Actuarial Society.

2) The other route to membership in the Dutch Actuarial Society involves combining study and work, as an "outside-university student." These students take the same required courses as the regular students but do not complete other courses required for a university degree. If they pass all the exams, they become members of the Society too. They do not get a degree from the university, as they have not taken all the courses. The students in this group are generally older than the students in the first group.

The numbers of regular and outside students enrolled at the university are about equal. "Graduates" of both types are respected members of the Actuarial Society.

The relationship between faculty members of the university and members and administrators of the Dutch Society is good. In addition, there are members of the Dutch

The Netherlands cont'd

Society who also are professors at the university.

One of the complaints of the enrolled regular university students is that they don't have work experience and that there always is a gap between a science and a real job. But this drawback appears to be outweighed by the advantages of the current system.

The proposal by Ardian Gill, described in the article referred to previously, is very similar to the way actuarial students are educated in The Netherlands. You earn a degree and become a member of the Society, because it accepts the examinations of the university. Moreover, you can become a member of the Society only if you take exams at the university.

Ron van Oijen is a student at San Francisco State University, on exchange from the University of Amsterdam. He also is working part-time at The Wyatt Company.

Study program

The "propedeutisch" program (i.e., first degree)

Trimester 1:

- calculus A
- linear algebra
- probability and statistics 1
- programming (Pascal)
- bookkeeping
- orientation

Trimester 2:

- calculus B
- linear algebra
- probability and statistics 1
- company economics 1 (to compare with accounting and finance)
- macro economics
- orientation

Trimester 3:

- calculus B
- linear algebra
- probability and statistics 1
- micro economics
- orientation
- company economics 2

"Master's" degree

Trimester 4:

- computer concepts
- calculus C
- linear algebra
- probability and statistics 2
- actuarial mathematics 1

Trimester 5:

- probability and statistics 2
- actuarial mathematics 1
- actuarial mathematics 2
- casualty insurance
- econometrics 1

Trimester 6:

- numerical methods
- practical programming

- actuarial mathematics 2
 - actuarial mathematics 3
 - practical econometrics
- Trimester 7:
- life insurance
 - pension A1
 - operations research
 - company economics 3
- Trimester 8:
- stochastic processes
 - casualty insurance A1
 - pensions A2
 - practical operations research
- Trimester 9:
- casualty insurance A2
 - life insurance A2
 - research assignment
- Trimesters 10, 11, and 12 comprise some elective courses. If you want, you can specialize in pensions, casualty insurance, or life insurance. In trimester 12 you get practical training within a company.

Former actuarial instructor dies

A chain of four persons has informed us that Ernest J. Oglesby, a retired professor of mathematics at the University of Virginia, died recently at age 97. Once a week for nearly 30 years, Professor Oglesby commuted from Charlottesville, Virginia, to Newark, New Jersey. There he gave classes to Prudential actuarial students and others preparing for such exams as the one-time Parts 3 and 4. Harold Dow, the third person in the above-mentioned chain, recalls that Professor Oglesby occasionally stayed overnight with one or another Prudential family and generally brought along house gifts of butter and cream from his farm. Besides teaching and farming, Professor Oglesby's activities included chairing the Albemarle County School board for over a decade. His many former students will be happy to know that he outlived the span of not only the American Experience Table but also (by one year less) the Northampton table.

Winners selected for most obscure actuarial tables

The SOA Research Department recently conducted a contest to determine the most obscure actuarial tables. The effort was intended to augment an index of mortality and morbidity tables being prepared by the research staff. Readers of *The Actuary* submitted a number of tables of which three have been chosen as the most obscure.

First prize was awarded to Robert D. Hohertz for his submission on "Total Abstinence Life Insurance." Interestingly, the table is part of a tract soliciting applications for nondrinkers and contains assumed deaths based on the New England Mutual Life Insurance Company pricing mortality during the mid-1840s. The solicitation was prepared by Elizur Wright.

Two runners-up also were selected. Jerome M. Stein submitted *A New Method for Valuing Annuities Upon Lives* by Richard Hayes. Printed in 1746, the book has an inscription that indicates a purchase date of April 1756 as well as handwritten calculations of annuity values in the flyleaves.

The final winner was the "Herget Mortality Table" prepared by R. Thomas Herget. The table studies 554 male descendants of an ancestor dating back to 1585. Herget says he developed the table to enhance his chances of passing the old Part Five. This table shows a great deal of originality as well as obscurity.

The Index of Mortality and Morbidity Tables will be completed shortly. The *Index* will be limited to actuarial tables dating back to 1925 and will contain:

- Formal title of the table
- Popular name for the table
- Author or committee
- Years of experience studied
- Reference

The major sources of information were the *Reports, Transactions, and Record*. In addition, the *Proceedings of the Conference of Actuaries in Public Practice* and *Journal of the American Academy of Actuaries* were examined. The *Index* will be updated as more tables are developed and expanded as more sources are reviewed.

FACTUARIES

by Deborah Poppel

This is another in a series of profiles of members of the Society's Board of Governors.



Name: Gary Corbett.

Birthday: January 23, 1936.

Birthplace: Victoria, B.C.

Current hometown: New York.

Current employer: Equitable Insurance Companies.

Marital status: Married to Consuelo.

Children: Marilyn, 29; Daryl, 27.

My first job was: Caddying.

The exams I flunked: Part 3 (Statistics and Finite Differences) twice.

The last book I read: *Bonfire of the Vanities*.

The last movie I saw: *Dead Poets Society*.

Nobody would believe it if they saw me: Not speak up.

The TV shows I stay home to watch: Unviewed episodes of "Star Trek"/"WKRP in Cincinnati"/"The Wonder Years"/"LA Law."

If I could change one thing about myself, I'd: Be more patient.

My fantasy is: Winning Wimbledon.

If I could do it over I'd have: Spent more time with our children.

My proudest moment was: Our entire family climbing Mt. Rainier in 1979.

My proudest actuarial moment: Becoming President of the Society.

The best time of my life: Is now.

Dear Editor:

Toward a better way

The SOA has recently completed a vote on a proposed constitutional amendment that will have been at best expensive and time-consuming and, at worst, divisive. The reason for this proposed constitutional amendment is that some FSAs object to the Board action approving a limited experiment to allow credit for college courses.

It is possible that we would have reached the point of constitutional amendment regardless of what other avenues the Society provided for formal disagreement with the Board. On the other hand, it might have been avoided if there had been other ways to express disagreement. Other vehicles for expressing displeasure might include:

1. Candidates for SOA office would state their views before the election. We still hold elections that are name-recognition contests. No one wants to see the Society election mimic the national elections, but there are effective intermediate solutions. I recommend that each candidate on the second ballot submit a one-page position paper to be included with the ballot. The position paper would answer two questions: "What are the important issues facing the Society of Actuaries today?" and "What would I attempt to do about them if elected?"

There has been concern in the past that if such a procedure were adopted, it would favor the employees of large firms with access to sophisticated public relations machinery. This could be avoided by requiring a statement identifying the primary author of the position paper or by requiring that position papers be drafted by the candidates.

2. Half an hour in one of the two general sessions at the annual meeting would be set aside for FSAs to address the Society on any topic for not more than five minutes. A committee would be empowered to select the six topics with the widest range of interest if more than six FSAs applied to speak.
3. A process similar to constitutional amendment would be established to effect formal expression of the sense of the SOA membership. Unlike constitutional amendment, the vote would not be held until the following

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Dear Editor cont'd

Board election, and the results of the vote would not modify the constitution or be binding on the Board of Governors. If this process were created, it should require the signatures of 5% of the Fellows to put an item on the ballot. This is currently the threshold for constitutional amendments, but that threshold should be raised to 10% (or even higher) in view of the costs and agony of such amendments.

The Society has grown large enough that it can no longer operate under the original (unstated) assumptions that FSAs know most other FSAs and that the meetings are small enough that all FSAs have access to a public forum. On the other hand, it is impossible to run the Society if every act of the Board is subject to referendum. I urge the Board to consider any or all of the above changes that will move to rectify this problem.

Godfrey Perrott

The way we've been

In response to the recent Special Report issue featuring the Task Force on the Actuary of the Future, this letter is intended to challenge the current structure of the actuarial exams. The paragraph that galvanized me into writing is titled "The Unifying Force."

Challenge number one: Is the purpose of the actuarial exams to be so difficult that the mere fact of enduring them for seven years or more is a unifying force in the profession?

Few other professions require so long a period of study. Even the government, in defining the necessary qualifications for an Enrolled Actuary, found three years of responsible experience to be sufficient. The world is trying to tell us something, and I submit that the process for accrediting an insurance actuary could be shortened significantly.

Challenge number two: Why has the actuarial profession never done any statistical studies to validate these exams?

The motto of the Society of Actuaries tells us that "the work of science is to substitute...demonstrations for impressions." To the best of my knowledge, no studies have ever been performed to measure whether there is any correlation between scores on examinations and subsequent professional success. Since failure in the early exams generally

precludes employment as an actuary, we have no way to measure the statistical type 2 error — rejecting a candidate who might have been successful in the profession.

Challenge number three: How much do we spend to produce an actuary?

Volunteers provide much of the study material. Except for the preliminary exams, the tests are developed by volunteers. And volunteers do all the grading of the essay questions. Thousands of volunteers supervise and proctor the exams. Because of the voluntary nature of this service, comprehensive records of the time involved are not kept. If the time were recorded and billed at appropriate rates for the salary levels of the volunteers, I believe many actuaries would be shocked.

In addition, almost all companies that employ actuarial students subsidize their study time. And all this says nothing of the stress and anxieties repeatedly suffered by the student for several years.

How much does it really cost to produce a qualified actuary? And how much is a newly accredited actuary worth? We need to do a far better job of analyzing costs and benefits.

Challenge number four: Do the exams foster a mind-set of such dogged stubbornness that we are unable to deal with change in a competent way?

Certainly, perseverance is an essential element in continuing through the exam process. In some aspects of actuarial work, this personal characteristic is valuable, even essential. But I wonder whether the difficulty of the exams represents a mechanism to control the size of the professional pool. It also seems to be a kind of hazing ritual, wherein the "in group" thinks:

I went through this process, and I suffered all these things to prove myself. I don't want to let anyone else into the group until they have had it as hard as I did.

As we look to the future of the actuarial profession and as we attempt to structure our organizations to meet the needs and challenges that we will be facing, I believe it is important to take a hard look at all the traditions and procedures that we follow, to determine whether they will continue to serve us well.

In particular, if we hope to attract more actuaries from the ranks of the business students, we need to be sure that unnecessary barriers are not placed in their way. I believe that most actuaries are forward-looking and that they will seriously consider whether "the way we've always done it" is still appropriate to new conditions and new requirements.

Carol A. Marler

Two for one

Savings Bank Life Insurance in New York celebrates its 50th anniversary with over \$15.7 billion of insurance in force.

The System also claims a record for actuarial longevity. In 50 years it has had only two chief actuaries: Carl F. Vietor, from 1939 to 1969, and Gordon Leavitt, since 1969.

Gordon Leavitt

Actuarial professorship

The University of Iowa is seeking candidates for The Principal Financial Group Professor of Actuarial Science, beginning August 1990. The Principal Financial Group will supplement the university salary and expense allowance by at least \$7,000 a year. The selection process for the position, which requires excellence in teaching and research, will begin December 1.

Applications also are sought for a less senior, tenure-track or tenured position, and for one-to-two-year visiting appointments. Specialties in either life or casualty are acceptable, and a Ph.D. is required for tenure-track appointment.

Applicants should send a C.V. and three letters of evaluation to Jim Broffitt, Department of Statistics and Actuarial Science, University of Iowa, Iowa City, IA 52242.

In memoriam

Kenneth J. Burton *ASA 1950
 John L. Cameron FSA 1927
 Dallas H. Feay ASA 1948
 Dale R. Gustafson FSA 1956
 Franklin B. Keachie ASA 1925
 George Kolodny FSA 1926
 Eduard H. Minor FSA 1950
 Edgar W. Pattison FSA 1967
 Denis Vanasse ASA 1965
 Robert A. Wishart ASA 1929

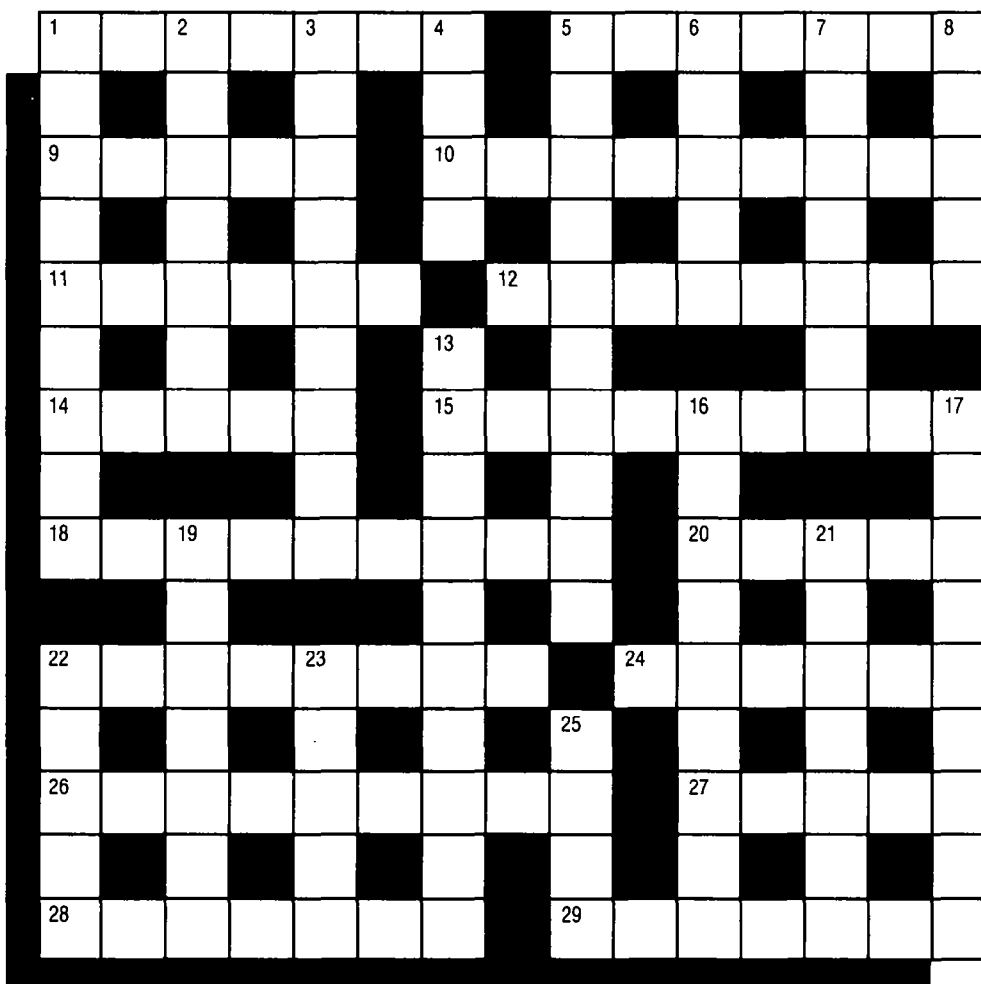
ACTUCROSSWORD

Across

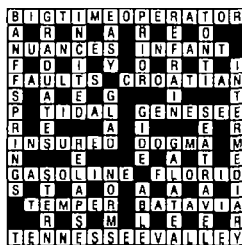
1. Named one- mine, for example (7)
5. Pass sideways (7)
9. Fabrication to which we owe a vested interest (5)
10. He stabs into ground formation for his studies (9)
11. Labor formation without direction but together (6)
12. How irritating must life be at this spot (8)
14. He took part in a pfennig elopement: Scott wrote of his fortunes (5)
15. Disapproval of thing in there is nothing in it (9)
18. Result as Part 2 follows (9)
20. Improper affair of the Alamo urns (5)
22. Captivating bracelet (8)
24. Less than height or law, but a likeness (6)
26. First of all, put a manor to rights (9)
27. River of legendary gold and Lorelei (5)
28. Seasoning and chemical residue of English town (7)
29. Sportsmen of East then West: that of Dickens was artful (7)

Down

1. Coin freshly minted in Indonesia (3,6)
2. Purport of how to become an ingratiate (7)
3. Anti-Nazi theologian of Milne role (9)
4. Competent in backward place of exile (4)
5. A man of Sherwood Forest, not the Jill (6,4)
6. Weight and state carriage (5)
7. His barber was of an orange town (7)
8. This thread is in the end of aforesaid town (5)
13. Monarchic abundance of gambler (5,5)
16. Licensed- for three-card trick (9)
17. Len serves, but without power (9)
19. Slender connection of 10 who fasten drills carefully (7)
21. An annuitant 22 to do this to his expectation (7)
22. Expectations of workshop estimates (5)
23. The point of bits of comedy and magic (5)
25. Part of what is needed for qualification and poker (4)



June's Solution



100% SOLVERS — *April & May*: D Baillie (& Jan), J Braue, J Brownlee, G Cherlyn, F Clarke, C Conradi, S Cuba, K Elder, C Galloway, J Grantier, C Hachmeister, R Hohertz, R & J Koch, W Lumsden, D & S Magnusson, P Marks, R C Martin, G & D Mazaitis, G D McDonald, H Migotti, B Packer, F Rathgeber, B Rickards, G Sherritt, J Singer, Mrs J S Thompson, P Thomson, M Vandesteeg, C Wasserman, D Weill, M Whitby, and A Whiton. *April*: L Abel, W Allison, A Amodeo, J Angle, F Bernardi, T Boehmer, J Brown, D Buman, R Carson, S Colpitts, L Cralle, J Darn-ton, N Fischer, B Fortier, R Frasca, A Garwood, O Gupta, R

Hamamo, C Hawes, W Hill, R Jenner, A P Johnson, O Karsten (& Jan), J Keller, D Kendall, A Keys, D Leapman, J Loria, M Lykins & C Mutti, M MacKinnon, R Maguire, S McCuaig & M Kirr, R A Miller, J Robinson, J Rumboldt & A Stein, A Santos & C Conforti, J Schwartz, N Shapiro, B Sherwood, A Showers, E Stroh, U Sukh, D Taub, A Telian, C Walker, D S Williams, and C Walls. *May*: J & M Accardo, F Alpert, J Beaton, M & D Brown, G Cameron, B Dibben, S Dulley, M Eckman, Mrs C Edwards, M Ely, C Friedrich, P Gollance, M Grover, J Mereu, C Montpetit, B Mowrey, P Peyser, J Rozkowski & M Neumeier, and M Steinhart.

Send solutions to: Competition Editor, 8620 N. Port Washington Rd (312), Milwaukee, WI 53217



ACTUCROSTIC

- A. Distant by a great deal; easily. (3 wds) _____
120 11 173 29 109 230 48 161 87 59
- B. Enlisted men; clerical group. (3 wds) _____
47 106 208 78 99 147 174

223 9 166 25
- C. Before; in front. (2 wds) _____
57 113 140 203 89 20 34
- D. The present is the right moment. (4 wds) _____
14 222 134 5 73 213 159 121

42 183 107 194
- E. Expertise. (hyph) _____
85 56 160 110 214 136 171
- F. Serenity; peace and quiet. (3 wds) _____
77 211 139 91 66 4

116 180 129 50 151
- G. Capital of Pakistan. _____
46 90 124 185 65 154 178 7 33
- H. Constant reiteration of the unhappy truth. _____
30 165 201 81 104 188 132
- I. One who espouses extreme changes. _____
119 51 209 177 92 187 28
- J. Watchful; mindful; keen. _____
55 19 133 200 88 149 108 204 31
- K. Excessive to an abnormal degree. _____
128 82 61 217 10 105 16 141 179
- L. Conservative; old fogy. (hyph) _____
226 53 40 6 167 111 156 26 206 142

68 192 158
- M. Settle; found; effect. _____
32 193 123 13 216 71 54 146 227
- N. Lode; blood vessel. _____
102 148 197 41
- O. Crucial moment; last minute. (2 wds) _____
118 8 150 98 228 80 212 43

22 169 70 58
- P. FDR, eg. _____
38 101 69 24 143 207 182
- Q. Melted. _____
114 18 62 164 96 205
- R. Second stage of a project, eg. (2 wds) _____
27 196 76 63 44 221 115 93
- S. Flooded; afloat. _____
45 189 175 95 137
- T. One espousing former and outmoded political views. _____
2 131 229 52 21 79 138 94

181 97 39
- U. How you stop all the electrical service to a house. (5 wds) _____
74 135 49 127 86 186 1 184

100 215 36 198 15 225 162 122 144

112 64 191 168 23
- V. You bet! And how! (2 wds) _____
125 153 220 202 35 170
- W. Explain; illustrate; spell out. (2 wds) _____
17 103 152 130 190 163 75
- X. Khedive of Egypt (1863-79). (2 wds) _____
60 195 37 172 72 176

117 83 210 224 3
- Y. A common form of protest these days. _____
12 145 155 84 218
- Z. Current U.S. Post Office emblem. _____
219 67 126 199 157

1 U	2 T	3 X	4 F	5 D	6 L	7 G	8 O	9 B	10 K	11 A	12 Y	13 M	14 D	15 U	16 K	17 W	18 Q			
19 J	20 C	21 T	22 C	23 U	24 P	25 B	26 L	27 R	28 I	29 A	30 H	31 J	32 M	33 G	34 C	35 V	36 U	37 X	38 P	39 T
40 L	41 N	42 D	43 O	44 R	45 S	46 G	47 B	48 A	49 U	50 F	51 I	52 T	53 L	54 M	55 J	56 E	57 C	58 O		
59 A	60 X	61 K	62 Q	63 R	64 U	65 G	66 F	67 Z	68 L	69 P	70 O	71 M	72 X	73 D	74 U	75 W	76 R	77 F	78 B	
79 T	80 O	81 H	82 K	83 X	84 Y	85 E	86 U	87 A	88 J	89 C	90 G	91 F	92 I	93 R	94 T	95 S	96 O	97 T	98 O	99 B
100 U	101 P	102 N	103 W	104 H	105 K	106 B	107 D	108 J	109 A	110 E	111 L	112 U	113 C	114 O	115 R	116 F	117 X			
118 O	119 I	120 A	121 D	122 U	123 M	124 G	125 V	126 Z	127 U	128 K	129 F	130 W	131 T	132 H	133 J	134 D	135 U	136 E	137 S	
138 T	139 F	140 C	141 K	142 L	143 P	144 U	145 Y	146 M	147 B	148 N	149 J	150 O	151 F	152 W	153 V	154 G	155 Y	156 L	157 Z	158 L
159 D	160 E	161 A	162 U	163 W	164 O	165 H	166 B	167 L	168 U	169 O	170 V	171 E	172 X	173 A	174 B	175 S	176 X			
177 I	178 G	179 K	180 F	181 T	182 P	183 D	184 U	185 G	186 U	187 I	188 H	189 S	190 W	191 U	192 L	193 M	194 O	195 X		
196 R	197 N	198 U	199 Z	200 J	201 H	202 V	203 C	204 J	205 O	206 L	207 P	208 B	209 I	210 X	211 F	212 O	213 D			
214 E	215 U	216 M	217 K	218 Y	219 Z	220 V	221 R	222 D	223 B	224 X	225 U	226 L	227 M	228 O	229 T	230 A				

MAY'S SOLUTION: Isaac Asimov, Boosting Our Self—, "The robots are coming! Don't fight them. Welcome them with open mind—circuits. Some fear a hostile robot takeover. Well, a robot is just another kind of horse. And we didn't worry about horses taking over when we put them to work, did we? Sure. Robots will take some jobs from humans. But think about—"

JUNE'S SOLUTION: Creative Brain Into Overdrive, "it. Most are jobs only a robot would want anyway. Even if we're up to our eyeballs in robots someday, there'll always be something they can't do that we must, if only to create more work for them. Me robot. You human. You master. Me slave. But together we make one fine world, you bet your microchips." CREATIVE LIVING, Spring, 1988.

