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RESERVING FOR AIDS

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In the United States, the Actuarial Standards Board (ASB) released in late 1989 an exposure draft entitled, "Guidance on Estimating and Providing for the Cost of HIV-Related Claims Covered under Life and Accident and Health Insurance Policies." This exposure draft addressed the nature and extent of actuarial attention required to evaluate the effects of the HIV epidemic for life and accident and health insurance. The exposure draft did not result in a final standard by year end 1989; however, it may still have been relied upon by some actuaries in their calculation of statutory or GAAP reserves. The exposure draft was based in part on material developed in two recent reports:

1. "Report of the Task Force on the Financial Implications of AIDS" and
2. Report of the Society of Actuaries Committee on HIV Research entitled, "U.S. General Population AIDS Mortality Rates"

In Canada, the Canadian Institute of Actuaries has provided "Guidance Notes for Valuation Actuaries" that recommends the data and methods that are to be used in dealing with the financial implications of AIDS.

This session will focus on the potential implications of these actuarial requirements for small, medium and large companies as well as on the possible strategies for dealing with the financial implications of AIDS including reserve calculation methodologies and cash flow testing.

MR. STEVEN I. SCHREIBER: We will discuss Reserving for AIDS in two parts. First, we will discuss what the requirements for AIDS reserving are in the U.K., Canada and the United States. In the second part, we will present two case studies, showing how two actuaries have tested for the AIDS risks of their respective companies in deciding whether additional reserves or surplus need to be allocated.

I will be the first speaker and will discuss AIDS reserving requirements in the U.K. and the proposed Actuarial Standards Board (ASB) Standard of Practice. I will also present the results of a survey that was conducted by Tim Harris in conjunction with the Society of Actuaries on what companies have actually been doing with regard to reserving for the AIDS risk.

Harold Ingraham, who is a Past President of the Society of the Actuaries and is the Chairperson of the Life Committee of the Actuarial Standards Board, will then present

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an update on the status of the draft exposure. Harold has very graciously accepted my last minute request for him to present the ASB view.

Mike McGuinness will be our third speaker. Mike is a consulting actuary with the Toronto office of Eckler Partners. From 1978-1988, he was the Valuation Actuary of a federally licensed Canadian life insurance company, with about \$1 billion worth of assets. He is currently a member of the Canadian Institute of Actuaries Committee on Life Insurance Financial Reporting. Long active in Society matters, Mike was until last October a Vice President responsible for education and examinations. Mike will provide the Canadian perspective on reserving for AIDS, and will discuss the AIDS Guidance Notes for Valuation Actuaries. He will also discuss how companies have responded to the Guidance Notes.

Our fourth speaker was scheduled to be Bob Potter, of Integon Life Insurance Corporation. Because of an accident, Bob is not able to be here. Instead, Alf Anderson, from Integon, will be making Bob's presentation.

Alf is Assistant Vice President and Assistant Actuary with Integon and is responsible for universal life and flexible premium annuity valuation. Alf is also involved in studying his company's mortality and lapse experience. Alf will present Bob's case study on AIDS reserving from a small to medium-sized company perspective. He will discuss how one actuary working with a fairly small staff was able to analyze the AIDS exposure risk of his company.

Alf was not involved in the work that Bob was going to talk about, so he will not be able to respond to any questions that you may have. I suggest that anyone with questions on Bob's presentation contact him directly at his yearbook address.

Our fifth speaker will be John Hanrahan. John is Vice President and Assistant Actuary with the Prudential Insurance Company. John has been with Prudential since 1978. He is currently responsible for individual life valuation. He is a long time member of the Society of Actuaries Education and Examination committee. John will be presenting a case study on how Prudential has determined its financial impact of its AIDS exposure.

U.K. AIDS RESERVING REQUIREMENTS

In the U.K., the Institute of Actuaries AIDS Working Party issued *Bulletin No. 2* in 1988, which recommended the use of the Institute's Projection F and the deficiency reserve approach for establishing additional reserves to cover the AIDS risk. The additional reserves held under the deficiency reserve approach are simply the present value of expected AIDS claims.

The Government Actuary, however, does allow the additional reserves established under that approach to be reduced by margins in the existing reserves. A majority of companies, though, hold the additional reserve based only on the deficiency reserve approach.

In the fall of 1989, the Institute of Actuaries Working Party issued *Bulletin No. 4*, which introduced seven new projection tables, tables P through Z. The Working Party recommended that Projection R become the new minimum for AIDS reserving.

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Projection R has extra mortality from AIDS increasing into the late 1990s, and then decreasing because of behavioral changes.

In December 1989, the Government Actuary required the use of a modified Projection R table. The modification was to assume that mortality remains level after reaching the peak amount in the late 1990s. The Government Actuary's reason for this modification was concern over the uncertainty about the spread of AIDS into the heterosexual community.

The impact on the AIDS reserve level because of this change from Projection F to modified Projection R depends on the guarantees in the policies. For shorter duration term assurance policies, with premium guarantees ten years or less, modified Projection R produces slightly lower reserves than under Projection F. For longer duration term assurance policies, with guarantees in the range of 30 years or so, the modified Projection R table can produce extra reserves double those produced under the Projection F scale.

Overall, for a typical life office writing an average mix of business, modified Projection R produces reserves which are slightly higher than Projection F reserves.

ACTUARIAL STANDARDS BOARD EXPOSURE DRAFT

In the United States, in late 1989, the ASB exposed a standard of practice on AIDS entitled "Guidance for Estimating and Providing for the Cost of HIV Related Claims Covered Under Life and Accident and Health Insurance Policies."

The proposed standard sets forth the nature and extent of actuarial attention that should be given to AIDS claims. It applies to reserving, to pricing, to repricing of nonguaranteed elements, and to appraisal work.

At this time, I am assuming that most of you have reviewed the standard and I will not go into the details of that standard. The exposure draft did not result in a final standard by year-end 1989, but may have been relied on by some actuaries in their calculations.

AIDS SURVEY RESULTS

Tim Harris, in conjunction with the Society of Actuaries, conducted a survey on AIDS reserving to find out what companies have been doing.

The survey was sent to everyone on the Society of Actuaries chief actuary list. We received 146 responses, 51 from mutual companies, and 95 from stock companies (Chart 1).

Close to 85% of the respondents have reviewed the July 1989 Society of Actuary AIDS Committee report (Chart 2), and 88% of the respondents have reviewed the ASB draft exposure (Chart 3).

Fifty-nine percent of the mutual companies and 47% of stock companies have projected the impact of AIDS on existing business (Chart 4).

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CHART 1

Number of Responses to AIDS Reserving Survey

Asset Categories	Mutual	Stock	Mutual & Stock
> 1 Billion	24	40	64
> 250 Million			
< 1 Billion	14	26	40
> 100 Million			
< 250 Million	8	15	23
> 25 Million			
< 100 Million	4	12	16
< 25 Million	1	2	3
Total	51	95	146

CHART 2

Have You Reviewed the July 1989 AIDS Committee Reports?
Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Yes	86.27	83.16	84.25
No	13.73	16.84	15.75

CHART 3

Have You Reviewed the Actuarial Standards Board Exposure Draft,
"Guidance on Estimating and Providing for the Cost of HIV-Related
Claims Covered Under Life and Accident and Health Policies?"
Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Yes	96.08	83.16	87.67
No	3.92	16.84	12.33

CHART 4

Has Your Company Projected the Impact of AIDS on Existing Business?
Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Yes	58.82	47.37	51.37
No	41.18	52.63	48.63

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More of the larger companies did projections than the smaller companies, which really is not surprising, given that the larger companies have more resources and the smaller companies may be more niche players, selling only in certain geographical areas.

Another question asked if cash flow testing was used to analyze the financial impact of AIDS. Only 22 out of 146 companies surveyed, or 15%, responded yes.

The next question asked respondents how they would categorize the exposure of their companies to the financial implications of AIDS on existing business. About 60% of the mutual company respondents felt their companies had either a moderate or high risk. That compares with about 42% of the stock company respondents (Chart 5).

CHART 5

How Would You Categorize Your Company's Exposure to the Financial Implications of AIDS on Existing Business?

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Little or No Risk	39.22	57.90	51.37
Moderate Risk	56.86	37.89	44.52
High Risk	3.92	4.21	4.11

Of the mutual company respondents who said that they had projected the impact of AIDS on existing business, 70% felt that their companies had either a moderate or high risk. This compares with 58% of the stock company respondents which projected the impact of AIDS on existing business and felt that their companies had either a moderate or high risk.

Seventy-two percent of the respondents from stock companies which did not do any projecting felt that their companies had little or no risk. Unfortunately, we were not able to determine from the survey what basis these companies used in determining that they had little or no risk.

Thirty-five percent of the respondents who felt their companies had either a moderate or high risk, did not do any projecting to try to quantify that risk.

Another question asked for companies to estimate the percentage of ordinary life business in the five highest risk states: California, New York, New Jersey, Florida and Texas. Of the stock companies which did not project the impact of AIDS on existing business, and which felt that they had little or no risk, 70% of those companies had more than 30% of their business in those high risk states.

Given the amount of information in the last sentence, I will restate it. We looked at the stock companies which did not project the impact of AIDS on existing business. And then we looked at the smaller subset of those companies which felt that they had little or

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no risk. Seventy percent of those companies had more than 30% of business in those five high risk states.

There were two stock companies which had more than 60% of their business in those five states but did not do any projecting of the impact of AIDS on their existing business. Both of those companies felt that they had little or no risk.

Only 10% of the companies surveyed established additional reserves or allocated surplus for AIDS in the 1989 statutory statements for individual life (Chart 6).

CHART 6

Did Your Company Establish Additional Reserves or Allocate Surplus for AIDS
in its 1989 Statutory Statement for Individual Life?

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Reserve	9.76	4.65	6.30
Surplus	2.44	4.65	3.94
Reason #1	53.65	47.67	49.60
Reason #2	9.76	23.26	18.90
Reason #3	7.32	11.63	10.24
Reason #4	12.19	3.49	6.30
Reason #5	4.88	4.65	4.72

Reasons given for not establishing reserve or allocating stock:

Reason #1 -- Covered by margins in table

Reason #2 -- Felt to be an insignificant risk

Reason #3 -- Management decision to delay recognition

Reason #4 -- Covered by a strategy of changed guaranteed elements

Reason #5 -- Other

Fifty percent of the respondents felt that the AIDS risk was covered by margins in the valuation table. Of those companies which felt that the AIDS risk was covered by margins in the valuation table, 35% did not do any projecting of the impact of AIDS on existing business.

Another 19% of the respondents gave reason number 2; they felt that there was an insignificant risk for their companies. Ten percent took a management decision to delay recognition of the impact.

Looking to what companies are doing with regard to new business, only 51% of mutual companies and 37% of stock companies have projected the impact of AIDS on new business (Chart 7). The responses to how companies categorize their exposure to the financial implications of AIDS on new business though, are very similar to how

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respondents categorized their companies exposure on existing business (Chart 8). That is a little surprising, given that almost all companies now are testing for the HIV antibodies.

CHART 7

Has Your Company Projected the Impact of AIDS on New Business?

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Yes	50.98	36.84	41.78
No	49.02	63.16	58.22

CHART 8

How Would You Categorize Your Company's Exposure to the Financial Implications of AIDS on New Business?

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Little or No Risk	39.22	58.95	52.05
Moderate Risk	58.82	40.00	46.58
High Risk	1.96	1.05	1.37

We saw on the previous slide that 41% of stock company respondents feel that their companies have a moderate or high exposure risk on new business. And here we see (Chart 9) that 37% of stock companies have incorporated the impact of AIDS into their pricing mortality. However, even though 61% of the mutual company respondents feel that they have a moderate or high risk on new business, only 41% have incorporated the impact of AIDS into their pricing mortality. This probably reflects mutual company ability to adjust dividend scales.

CHART 9

Has Your Company Incorporated the Impact of AIDS in its Pricing Mortality?

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
Yes	41.18	36.84	38.36
No	58.82	63.16	61.64

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One way that some companies have incorporated the impact of AIDS into pricing is by not assuming the mortality improvement they otherwise would have assumed. The problem with that approach is that most of the mortality improvement has been occurring at older ages, not at the ages where they will see AIDS claims.

We surveyed the blood testing limits for a male in the 25 to 40 year age range. The term limits are very similar to the permanent limits. If we remove the no responses, and we adjust the percentages shown in this slide, close to 83% of the companies now test at or below face amounts of \$100,000 (Chart 10).

CHART 10

1989 Permanent Blood Testing Limits for AIDS for a Male Age 25-40

Totals of All Asset Categories

Response	Mutual Percent	Stock Percent	Mutual & Stock Percent
All Business	1.96	2.11	2.05
15,000	1.96	---	.69
50,000	---	1.05	.69
75,000	---	1.05	.69
95,000	---	1.05	.69
100,000	60.79	61.06	60.95
100,001	11.76	9.47	10.27
101,000	---	2.11	1.36
150,000	---	1.05	.69
150,001	---	1.05	.69
250,000	1.96	---	.69
No Responses	21.57	20.00	20.54

In my opinion, most, if not all, of the 17% of the companies with testing limits above \$100,000 have a moderate or high risk exposure for new business. Six out of seven of the mutual companies which test above \$100,000, agree with me. They felt that their companies have a moderate or high risk exposure. However, only four out of 13 stock companies with testing limits in excess of \$100,000 feel that they have a moderate or high risk exposure on new business.

Based on the results of this survey, I have the following comments and concerns.

1. I am concerned that only 50% of the surveyed companies are projecting the impact of AIDS on existing business. While there are many unknowns involved in the projecting process, this is not a reason not to perform projections. Actuaries are responsible for opining on the adequacy of reserves for statutory reporting purposes, and for preparing a report to management supporting that opinion.

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2. I am concerned that only 10% of the surveyed companies have established additional reserves or allocated surplus to cover the AIDS risk. Fifty percent of the respondents gave reason number one as the reason for not establishing additional reserves. They felt that their companies were covered by margins in the valuation table. Determining whether these margins exist is not as simple as just comparing the rates in the valuation table to expected mortality with AIDS included. It is very important to recognize the selective nature of lapsation involved here. If these companies do reflect the selective nature of lapsation, many might discover that margins are not there.
3. Looking at the year-by-year results of a gross premium valuation is more important than just comparing the present value of future benefits and expenses to the present value of future premiums. Under the present value approach, the future sufficiencies which might emerge after the AIDS claim peak period may be sufficient to offset the AIDS claims that will be incurred in those peak years. However, you need to make sure that your company is strong enough to survive the peak claim years, so it can benefit from those sufficiencies in the later years.

The Actuarial Standards Board proposed Standard of Practice is meant to provide guidance to the actuary in carrying out his or her professional responsibilities in estimating and providing for future claim costs arising from the HIV epidemic. According to the score card that we receive with our Academy mailings, the proposed Standard was supposed to be approved by the ASB this month. However, last week the ASB decided not to approve the standard and instead, because of major revisions that were made, the ASB has decided to reexpose the standard.

The reexposed draft is tentatively scheduled to be released with the May Academy mailings. Harold Ingraham will now talk about why the ASB has decided to reexpose the draft, and what some of the major changes are that have been made.

ACTUARIAL STANDARDS BOARD REVISED EXPOSURE DRAFT

MR. HAROLD G. INGRAHAM, JR.: This truly is a late-breaking development. The proposed standard was developed by the life committee of the ASB last year with the assistance of an ad hoc drafting task force. It was approved for exposure by the ASB last October with a deadline for comments of February 15.

Twenty-seven members responded, which is really not too gratifying when you consider the size of the Academy membership. Highlights of the standard were set forth in an article in the November 1989 issue of *The Update*. Two weeks ago the ASB decided to reexpose the revised version of the standard. The principal reason for doing this was to clarify the ASB's position regarding reserve strengthening.

Many respondents to the original expose draft of the Standard pointed out the inconsistency between subsections 5.2 and 6.1.

Subsection 5.2 stated that reserves should be increased directly instead of making an allocation of surplus, if reserve testing indicated that reserves should be increased. On the other hand, the original subsection 6.1 indicated that any excess claims cost not

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covered by reserves could be provided for by an appropriation of surplus or by other adjustments. It did not say what those other adjustments were. So we had to eliminate this inconsistency. And to do so, both of the subsections have been substantially rewritten.

The key issue identified in revised subsection 5.2 is whether sufficient funds are being accumulated to address the financial implications of the HIV epidemic. Because it is not very long, I will now read the exact language of revised subsection 5.2. The heading of the section is reserve testing.

The actuary should provide for the estimated cost of claims deemed related to HIV infection by establishing the appropriate reserves. In determining the amount of such reserves, the actuary may take into account reasonably anticipated actions of the company, such as dividend scale decreases or changes in nonguaranteed policy elements. If, in the actuary's judgment, the reserve testing does indicate a need to increase reserves to cover any excess claims cost, the reserves should be increased directly instead of alternatively making an appropriation of surplus. The actuary should also determine the period over which any additional reserves should be funded.

In any report prepared by the actuary dealing with reserves, the actuary should document that statutory or GAAP reserves contain appropriate provision for the estimated cost of claims deemed related to the HIV infection.

Now what does that really say? Well, the redrafted Standard now makes perfectly clear that reserves should be increased directly to cover any excess claims costs related to HIV infection, instead of alternatively making an appropriation of surplus.

In this regard, not only does the ASB believe that reserve strengthening is the proper theoretical approach, but the ASB also notes that the actuary certifying an insurer's reserves must state that the reserves make good and sufficient provision for the unma-tured obligations of the company.

In commenting on the original exposure draft of the Standard, a number of respondents suggested various reasons why insurers might prefer alternative approaches. I will discuss three or four of these.

One argument was Insurance Department scrutiny of reserve credits taken by ceding insurers.

Another is the fact that current federal income tax law does not recognize strengthened reserves for HIV purposes as deductible expenses.

Another argument given was that if an insurer sets up additional reserves to cover any excess claims costs attributable to the HIV epidemic which subsequently are deemed excessive, then it has to go and secure regulatory approval at a later date to release them.

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And another argument made had to do with the fact that setting up those reserves might have an impact on rating agency evaluations. I think that's the weakest of the arguments.

With respect to documentation, revised subsection 6.1 specifies that if the actuary prepares a report, the report should state whether or not the impact of the HIV epidemic was considered, and if not, why not. Also, if a report is not made, similarly, the actuary should be prepared to explain whether or not the HIV epidemic was considered, and if not, why not. But most importantly, the revised standard reaffirms that if the actuary does not establish additional reserves as the result of his or her analysis, then the actuary should document the reasons.

Several respondents to the original exposure draft of the Standard expressed the opinion that the ASB did not make a substantial case for the promulgation of the Standard. The ASB disagrees with that position. At the present time, the ASB believes that existing standards of practice dealing with life insurance company financial reporting really do not provide sufficient guidance to the actuary in the general area of reserve testing to address the HIV issue adequately.

The ASB also noted that the Canadian Institute of Actuaries' Committee on Life Insurance Financial Reporting and Committee on Standards of Practice have already approved the December 1989, discussion draft on this very subject of reserving for AIDS. Also, as noted earlier, the same subject has been addressed by the AIDS Working Party of the Institute of Actuaries in the U.K.

I will conclude by saying that the second exposure period for the standard is going to run until September 1 of this year. Then, the ASB life committee will meet to absorb what hopefully will be a deluge of comments. The final version of this Standard will then be presented for adoption by the ASB in October.

CANADIAN RESERVING REQUIREMENTS

MR. MICHAEL B. MCGUINNESS: When Tim Harris invited me to be a member of this panel, he said it would be helpful for the U.S. actuaries in the audience to hear from a Canadian about the actual experience we have had in reserving for AIDS. Listening to Harold a couple of minutes ago, I was struck by how our approaches seem to be converging.

Tim and I both assumed that this audience would be made up almost entirely of U.S. residents. For those Canadians sitting here, please wait until I have finished speaking before rushing to contradict me on errors of fact.

The approach taken to reserving for AIDS by Canadian companies differs from that taken in the U.S. because of the different regulatory environment in our country. The large majority of Canadian companies are federally licensed and solvency standards are prescribed for them by the Federal Office of the Superintendent of Financial Institutions Canada, which of course, gets abbreviated to OSFI since nobody can cope with that mouthful.

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This means that decisions about reserving standards, for example, can be implemented somewhat more rapidly in certain instances than in the U.S.

There are also some substantial provincially licensed life companies, particularly in the province of Quebec. While the Quebec reserving requirements are not necessarily always the same as those of OSFI, in practice they are very similar.

Another feature of the Canadian environment which I am happy to stress is the strong position currently enjoyed by the Canadian Institute of Actuaries, and the good spirit of cooperation which exists between the profession and the regulators, both federal and provincial. One of the committees of the Canadian Institute that Harold has already referred to is the Committee on Life Insurance Financial Reporting. Its members are chosen from a cross section of life companies of all sizes, as well as from the ranks of consultants. There are also at present two regulators on it, one federal and one from Quebec.

Canada differs also from the U.S. in requiring that the annual statement filed by the regulators include an opinion by a Valuation Actuary, a position which has existed since 1978. The Valuation Actuary must be a Fellow of the Canadian Institute of Actuaries, and therefore, is subject to its disciplinary process. She or he must sign an opinion stating that:

- o the assumptions used in reserve calculations are appropriate to the circumstances of the company and the policies being valued;
- o that the methods used produce reserves for each policy not less than those produced by the methods prescribed by the Canadian and British Insurance Companies Act; and
- o that the reserves make good and sufficient provision for all unmatured obligations under the policies.

It should be noted that the Act and regulations do not provide minimum assumptions to be used as the reserve basis; these are the professional responsibility of the Valuation Actuary. But, and it is a significant but, the regulator has the right to prescribe higher bases if he believes that those of the actuary are inadequate.

In June 1988, the CIA responded to the general concern over AIDS by appointing a series of committees to guide Canadian actuaries. One of these was to produce the best possible model on HIV infections and AIDS claims in Canada. Another was to use these data to prepare recommendations for the Committee on Financial Reporting on how valuation actuaries should address the issue of AIDS. It was recognized that the data available could lead to more than one conclusion about the level and the incidence of future AIDS claims and that any recommendations for reserving for 1988 year-end would have to be developed very rapidly. But it was still believed that the effort would be worthwhile.

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The result was the 1988 Guidance Notes for Valuation Actuaries which were dated November 1988, and distributed to all Canadian actuaries just before the 1988 year-end. In December 1988, in its annual memorandum to valuation actuaries about year-end reporting, OSFI backed up these Guidance Notes by saying, "the Valuation Actuary should take into consideration the recommendations contained in the 1988 Guidance Notes."

WHAT DO THE GUIDANCE NOTES SAY?

It was made clear from the beginning that they applied only to ordinary life insurance, and that they were very much an interim measure. It was expected that they would be replaced by something more permanent before the 1989 year-end and that turned out to be quite an optimistic assumption.

The Note also said that the minimum acceptable reserve for 1988 was to be based on the current estimate of HIV infections and declining future infections. The actual array of q_x 's produced assumed that infections were level from 1984 to the end of 1988, and decreased after that uniformly to zero at 1999.

The Note also said, "We do not feel it would be inappropriate to provide for additional AIDS claims through the use of either an AIDS reserve greater than the minimum, or increased margins for adverse deviation in the basic reserves."

The Note went on to make *eight* specific recommendations.

The first recommendation was that the Valuation Actuary make specific allowance for excess mortality due to AIDS in calculating actuarial reserves.

The second recommendation was that both the assumptions and reserves for deaths associated with AIDS should be separately identified and commented on in the Valuation Actuary's report. This report is a comprehensive and confidential document which is filed annually by the Valuation Actuary with the regulatory authorities at the same time the annual statutory statement is filed.

The third recommendation was that the Valuation Actuary should base the minimum reserves on the proposed intercompany extra mortality table derived in the Guidance Notes, because it was held that any individual company's claims data would be statistically unreliable.

THE OTHER RECOMMENDATIONS

- o allowed for adjustments to the intercompany extra mortality table based on the circumstances of the company;
- o allowed one to assume that the epidemic would not spread beyond the current high risk group for purposes of calculating reserves;
- o permitted the use of surplus margins in the gross premium as compared to the valuation premium as a possible offset the part of the required reserve; and,

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- o disallowed taking into account the underwriting practices of the company, other than specific blood profile testing for HIV positive.

The Guidance Notes provided two tables of increase in mortality rates under two different sets of assumptions. The first was that new HIV infections remained level in all years subsequent to 1988, and the second was that the new infections declined uniformly to zero starting at the end of 1988. Each table showed the increase in mortality rates for attained ages 22-64 for calendar years 1989 through 2018.

These two tables were developed originally by the CIA's modeling subcommittee and were accepted by the subcommittee that wrote the Guidance Notes. As mentioned previously, the subcommittee also recommended that the second table, that is the one with the declining level of new infections, should be used as the starting point for calculating AIDS reserves in 1988.

Since these tables of increase in mortality rates were based on population experience, the Guidance Notes next described a method for converting these to exposure based on insurance experience. On the assumption that the young, single group -- males and females, ages 25 through 45 -- represented the "at risk" group, it used ratios based on a Life Insurance Marketing and Research Association (LIMRA) study of the percentage of households in this group owning life insurance to the percentage of all households owning life insurance, and multiplied this by the ratio of coverage held by the "at risk" group to coverage held by all groups combined.

A further adjustment was then made to allow for antiselection. On the assumption that the public began to be aware of the AIDS risk starting in 1984, it was recommended that business in force be split between that issued in 1983 and earlier, and that issued in 1984 and later. Applying the ratios already described to the population mortality data, it was finally concluded that insured life data for issues of 1983 and earlier could be appropriately represented by a figure of 60% of the population mortality and, for 1984 and later issues, by 100% of population mortality.

The Guidance Notes recommended holding an additional specific reserve for the AIDS risk, rather than calculating new reserves by introducing the excess mortality rates directly into the valuation process. Apart from the severely practical advantage of creating much less additional work for valuation actuaries and their staffs -- remember that the Notes appeared in December 1988 for use in the 1988 year-end -- this also enabled them to take account directly of the much lower lapse rates to be expected from the "at risk" groups. In the numeric examples of the present value of excess AIDS claims, zero lapse rates were used.

The Guidance Notes recommended adjusting reserves to take account of the following:

- o that no reserves be held on female lives, reflecting Canadian population experience, including the lack of HIV infections among intravenous drug users in Canada; and,

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- o that there be geographic adjustments. The incidence of infections in the metropolitan areas of Vancouver, Montreal and Toronto, which seem to be the cities that the Society likes to hold meetings at, is several times that of the rest of the country.

Separate tables were also produced for U.S. experience using the same methodology. Several of the large Canadian companies have more business in the U.S. than they have in Canada. Since Valuation Actuaries sign an opinion for the companies as a whole, U.S. tables were needed.

The ratios used to convert population data to insured lives data for U.S. issues before and after the first of January 1984 were 45% and 75%, respectively. These ratios are lower as compared to those for Canadian data to take account of IV drug users who, it was assumed, were not a group which would buy life insurance.

What sort of extra mortality do these guidance notes produce? For the Canadian data, the increase in 1000 q_x in 1989 was just over 0.2 for the peak ages of 30-35, dropping to .1 by age 50. In the level infection scenario, the rates rose to a maximum of 1.26 by about the year 2000. For the declining infection scenario, the rates never rose above 1. The increase in a \$1,000 single premium term to age 95 reserve, assuming 10% interest and zero lapsation, was 2.15 at 17, peaked at 4.23 at age 24, and then dropped fairly smoothly to .99 at age 48.

The tables prepared from U.S. data showed a very similar pattern, except that all numbers were about three times those for the corresponding Canadian data. The corresponding term to 95 single premium reserve was 6.78 at 17, peaked at 13.34 at 24, and then dropped to 4.08 by 48.

In their reporting requirements for the 1988 year-end, OSFI allowed Canadian companies a certain flexibility in reporting their AIDS provision by allowing them to include it with the actuarial reserve in the valuation exhibit, or as an item of appropriated surplus. Either way, the item reduces the unassigned surplus, but if treated as appropriated surplus, the year by year change does not flow through the income account, but instead is an item in the reconciliation of surplus.

How did the Canadian companies respond? OSFI has produced what is called, "A Report on Company Valuation Practices for 1988 Year-End with Respect to AIDS." This report produces, for companies doing business in Canada, much of the same information which Steve has given for companies doing business in the United States.

A preliminary survey of the findings was given at one of the Canadian sessions at the September 1989 Valuation Actuary symposium in Philadelphia by Andre L'Esperance, who is an actuary with OSFI, and a member of the Financial Reporting Committee. When I told him that I wanted to quote from the report at this session, he enthusiastically agreed to my doing so. The report describes the returns from 56 Canadian companies, 11 British companies, and 83 foreign companies. These definitions are from Canadian legislation, and I believe that virtually all of the 83 "foreign" companies were U.S. companies.

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The companies were further broken down in size, with companies having under \$200 million in assets being classified as small, with companies having between \$200 million and \$4 billion in assets being classified as medium, and with companies having over \$4 billion in assets being classified as large. (For Canadian companies, these figures refer to total assets, and for non-Canadian companies, they refer to liabilities in Canada.)

Out of 150 Valuation Actuary reports, only one British and nine foreign companies "neglected to discuss the ramifications of the AIDS epidemic on their claims." A follow up request was sent to the 10 culprits, but the report does not say what happened after that. Of the 140 companies which responded, 90 explicitly determined allowances for excess mortality, and 50 reported that implicit provisions were available where needed. Fifty of the 56 Canadian companies set up an explicit provision. Forty of the 84 non-Canadian companies set up an explicit provision, and 44 non-Canadian companies used implicit provisions which they said were available.

This difference does not surprise me. Non-Canadian companies do not have to file an income statement for their Canadian operations, they merely have to report that they have sufficient assets on deposit in Canada to meet their liabilities and certain surplus requirements. It appears much more likely that they would have margins in their excess assets, which the Valuation Actuaries felt were sufficient for this purpose. It was also certainly the case for many of the companies that the volume of business involved was trivial.

Thirty-one of the 50 Canadian companies which set up an explicit provision for excess AIDS mortality set up the additional provision as a reserve, 16 companies used an appropriation of surplus, and three companies set up a combination of both.

The total amount initially allotted as an explicit AIDS provision for 1988 year-end by all the companies combined was \$489 million. Ten of the 90 companies then used existing valuation margins to reduce their allowances by \$110 million, resulting in a net increase in liabilities and/or appropriated surplus of \$379 million. Translated into dollars of reserve per thousand of inforce, the amounts for individual companies ranged all the way from zero to \$14.34, but 80% of the respondents were in the range from \$.50-2.00. As a percentage of capital and unappropriated surplus, the answers varied for Canadian and non-Canadian companies. For non-Canadian companies, all provisions were within the limit of 80% of capital and unassigned surplus; for small Canadian companies, the range went from 71-335%. As a percentage of liabilities, the provision in foreign companies was under 35% in each case. For small Canadian companies, it was under 21%. For medium and large Canadian companies, the maximum provision was 11%.

For reserving for AIDS for the 1989 year-end, Canadian Valuation Actuaries received the 1989 Guidance Notes.

The Notes called for a continuation of the same techniques for this year as had been used for the previous year, and indeed were based on the same tables of extra mortality. The subcommittee on modeling concluded that the extra data which had become available during 1989 were not conclusive enough to warrant the work involved in changing the mortality assumptions. The Notes also pointed out that:

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Care must be taken in calculating AIDS reserves on business issued in the years prior to the year of valuation. It would not be correct to simply advance the AIDS reserves calculated at the end of 1988 for interest and survivorship, and apply them to the business remaining in force at the end of 1989, since the reduction due to lapses is assumed to be largely, if not solely attributable to lives not at risk to AIDS.

The Notes therefore suggested some alternatives based on the 1988 year-end inforce.

FUTURE OUTLOOK

We expect in the near future, when the necessary legislation is passed by the Canadian parliament, a major change in the method of valuation of actuarial liabilities for Canadian Life Insurance companies to the policy premium method. This is essentially a form of gross premium valuation, and will result in considerable changes in the statutory reserves of all life companies doing business in Canada.

The Canadian Institute of Actuaries, as Harold mentioned, has also developed a Valuation Technique Paper on reserving for AIDS. The Technique Paper allows for methods of reserving which can be independent of the policy premium method, and could possibly be in effect for 1990.

The Valuation Technique Paper builds on the work of the Guidance Notes. But it does require specifically, at least in its present form, that a new set of mortality rates be developed which include the extra mortality for AIDS, as the mortality basis for the reserves. So as I said, it parallels very closely what the ASB has recommended.

RESERVING FOR AIDS -- SMALL- TO MEDIUM-SIZE COMPANY CASE STUDY

MR. ALF H. ANDERSON: I am not Bob Potter, but just pretend that I am. This is Bob Potter's presentation.

My role on this panel is to present a case study of what one actuary in a small- to medium-sized company has done to begin a review of the potential need for extra AIDS reserves in his company. Let me say at the outset that this example is not intended to be a blueprint of all the things one should do in analyzing the future of AIDS claims for one's company. It is, however, an illustration of what can be done with a reasonable amount of effort, and in spite of the limitations on time and resources most of us in small or medium-sized companies continually face.

To begin, I asked myself this question: "Can I demonstrate to myself and to senior management that we should begin today to establish extra reserves for AIDS, and if so, at what level?"

My approach to answering this question involved the following steps for our ordinary life product lines:

- o Development of inforce data

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- o Construction of a simple projection model for future AIDS claims
- o Tests of statutory reserve adequacy.

Let's look first at the development of inforce data. The outset of the project to use our December 31, 1988, inforce files as a place to start, so that I could compare projected results to our actual experience from this block in 1989 and subsequent years. In my company's case, we have separate valuation systems for our three major segments of ordinary business:

- o Traditional whole life and term
- o Universal life
- o Mortgage decreasing term.

Since these blocks have significant differences in terms of risk characteristics, I decided to project the claims from each block separately, and then combine the results. For each of these segments, one of our actuarial technicians developed a series of reports which summarized our inforce as follows:

- o By sex, in ten-year attained age groups
- o By state
- o By issue-year groups.

I planned initially to project AIDS claims for males only, feeling that AIDS claim for our female insureds would not likely be significant. I should also note that I chose to group our joint policies with the female policies on the assumption that the risk for these policies is also not significant.

The purpose of using 10-year age groups was primarily to limit the amount of data entry that I would have to do. The incidence of AIDS cases has varied significantly from one state to another. Since my company has in prior years concentrated its life insurance marketing efforts in the Southeastern and Sunbelt states, I felt it would be important to reflect this geographic distribution somehow in the projection process. State codes on our master files and valuation files made such a distribution easy to obtain.

I had also discussed with our Medical Director, who at the time had been attempting to track our actual AIDS claims, how to group our business by year of issue so as to allow for such influences as our testing for AIDS and for possible periods of antiselection prior to testing. The breakdown we constructed was:

- o 1982 and earlier, where we have no testing, but no antiselection
- o 1983 and 1984, no testing, but antiselection

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o 1985 and later, where we have both tested business and not-tested business.

Those of you who are familiar with the July 1989 Report of the Task Force on the Financial Implications of AIDS will recognize that our breakdown was somewhat different than that suggested in the report. We began our work before the report was available. Fortunately our grouping is similar enough, I felt, to make use of the projection factors suggested in the report when constructing the projection model. Let me now discuss the construction of the projection model.

I'd like to touch on each of the basic building blocks of the spreadsheet model, and the assumptions I made. I should perhaps confess that the first thing I had to do was to learn how to use a spreadsheet software package, and then I had to get access to a personal computer, which I found I could do most conveniently after-hours when others had gone home for the day and my phone wasn't ringing.

The first building block I required was a set of assumptions as to the extra AIDS mortality rates. I chose as a starting point the Middle Scenario in the June 1989 Report of the Society of Actuaries Committee on HIV Research. For those of you who may not have yet read this document, the rates have been published in a form which is quite easy to use in a spreadsheet projection model of inforce business, since AIDS mortality rates are shown for each future year, based on attained age in 1989. I later ran the projection using the high scenario for comparison purposes.

The second building block was a set of geographic adjustment factors, which are included in Appendix 4 to the July 1989 Task Force Report, I referred earlier. I separately applied the "Suggested State AIDS Incidence Multipliers" to the summary of male inforce by state for each of the three ordinary inforce segments to arrive at an overall weighted average factor to apply to the AIDS rate for each of the ten-year age groups. I took an overall average factor approach to keep the spreadsheet small and manageable, rather than doing state-by-state projections (Chart 11). The overall geographic adjustment factors for my company were on the order of 65-75% of the general population.

CHART 11
Geographic Adjustment Factors

State	Factor *	In Force	Factor X In Force
AL	0.6	38,860	23,316
AK	0.3	0	0
GA	1.3	187,590	243,867
.	.	.	.
.	.	.	.
.	.	.	.
Total	.	1,454,555	1,118,023

Overall Factor: .77

*Factors from July 1989 Task Force Report

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The July 1989 Task Force Report also suggests year-of-issue adjustment factors which can be applied to the general population AIDS mortality rates to obtain rates for insured lives. These factors are:

- o 40% for business issued in 1983 and earlier years
- o 80% for untested business issued in 1984 and later
- o 60% for tested business, after adjustment to remove deaths resulting from infections prior to year of testing.

Again, to keep my spreadsheet simple, I chose one factor for each inforce segment:

- o Traditional whole life and term: .70
- o Universal life: .75
- o Mortgage decreasing term: .60.

I derived these factors by reviewing the inforce distributions by year-of-issue and noting the percentage of tested business. For most lines, our average policy size is below our testing limit. My intention was to err on the conservative side.

Now let us talk about termination rates to be used when projecting future inforce amounts and future AIDS claims. I attempted to simplify the projection process. The primary considerations for me were that the base AIDS rates I was using were general population rates, and that I needed to allow for anti-selection by the "at risk" group.

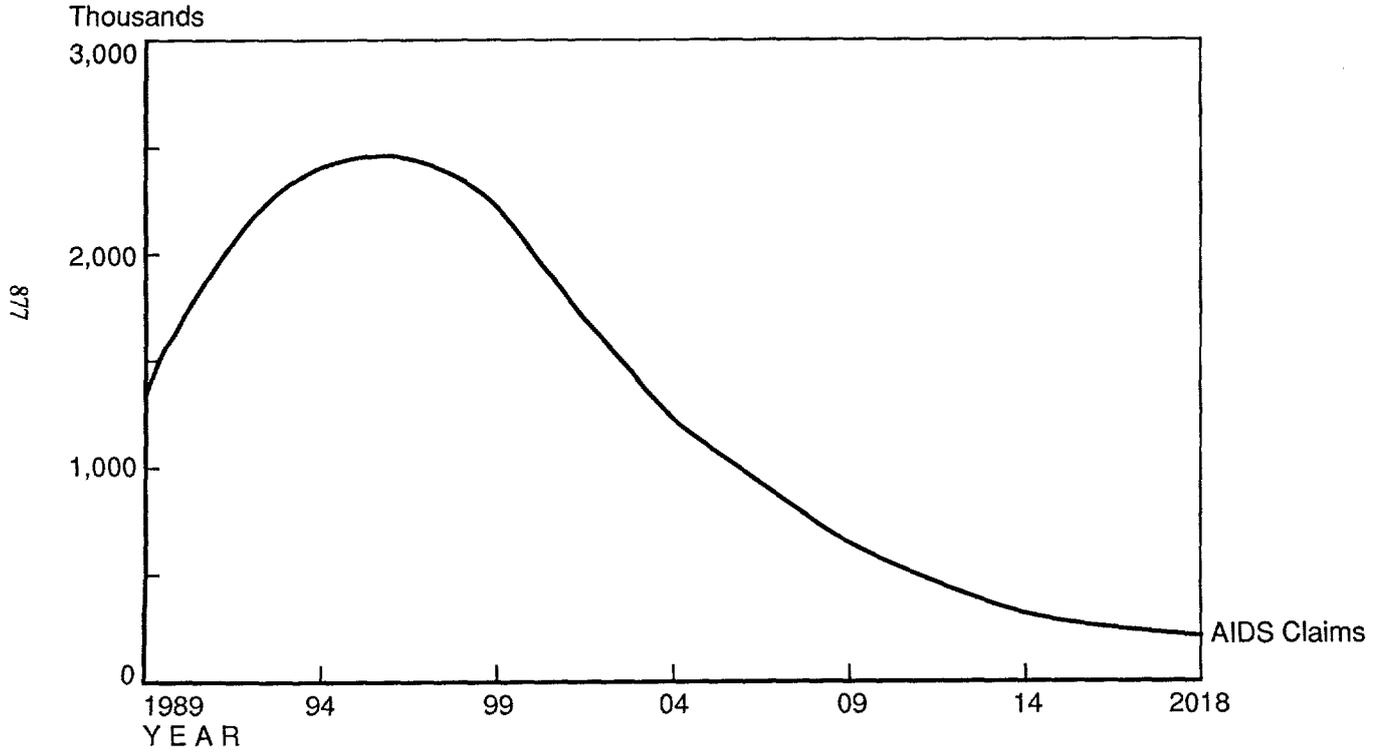
To avoid having to mechanically adjust the population AIDS rate for lapses by healthy lives, I decided to project the inforce assuming only a mortality decrement and no lapses. I then applied the extra AIDS mortality rate to arrive at the AIDS claims for each projection year. For the mortgage decreasing term business, I assumed that death benefits decreased according to a 10% loan amortization schedule.

Chart 12 illustrates the mechanics of the spreadsheet, while Chart 13 shows the results of the projection. My projected results were somewhat higher than actual, which may indicate conservatism, a chance fluctuation, or under reporting of actual claims.

CHART 12
Projection of AIDS Claims For UL Age Group: 40-49 Male

Projection Year	In Force(000)	Termination Rate	AIDS Rate Per 1000	AIDS Claims (000)
1989	1,306,255	0.00274	0.187	\$ 244
1990	1,302,431	0.00307	0.224	292
1991	1,298,141	0.00343	0.251	326
---	---	---	---	---
2018	786,544	0.05231	0.015	12

PROJECTED AIDS CLAIMS
Middle Scenario



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CHART 13

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Note the pattern of extra AIDS claims, with the peak near the middle of the 1990s. Because of this pattern, funding with a level contribution each year would generate negative reserves. If reserves are to be established, some sort of a limited payment approach would be appropriate.

My next step was to determine if margins in our statutory reserves are currently adequate to provide for some or all of the excess AIDS claims. To do so, I developed:

- o The present value of AIDS claims
- o A gross premium valuation
- o A comparison of net statutory reserves to the sum of the present value of AIDS claims and the gross premium reserves.

Chart 14 shows the results of my calculations, which would seem to indicate that there is not an urgent need to establish reserves at this time.

CHART 14

Comparison -- Middle Scenario (000s)

Statutory Net Reserves:	\$274,000
Gross Premium Valuation:	229,000
Present Value of AIDS Claims:	20,000
Margin:	\$25,000

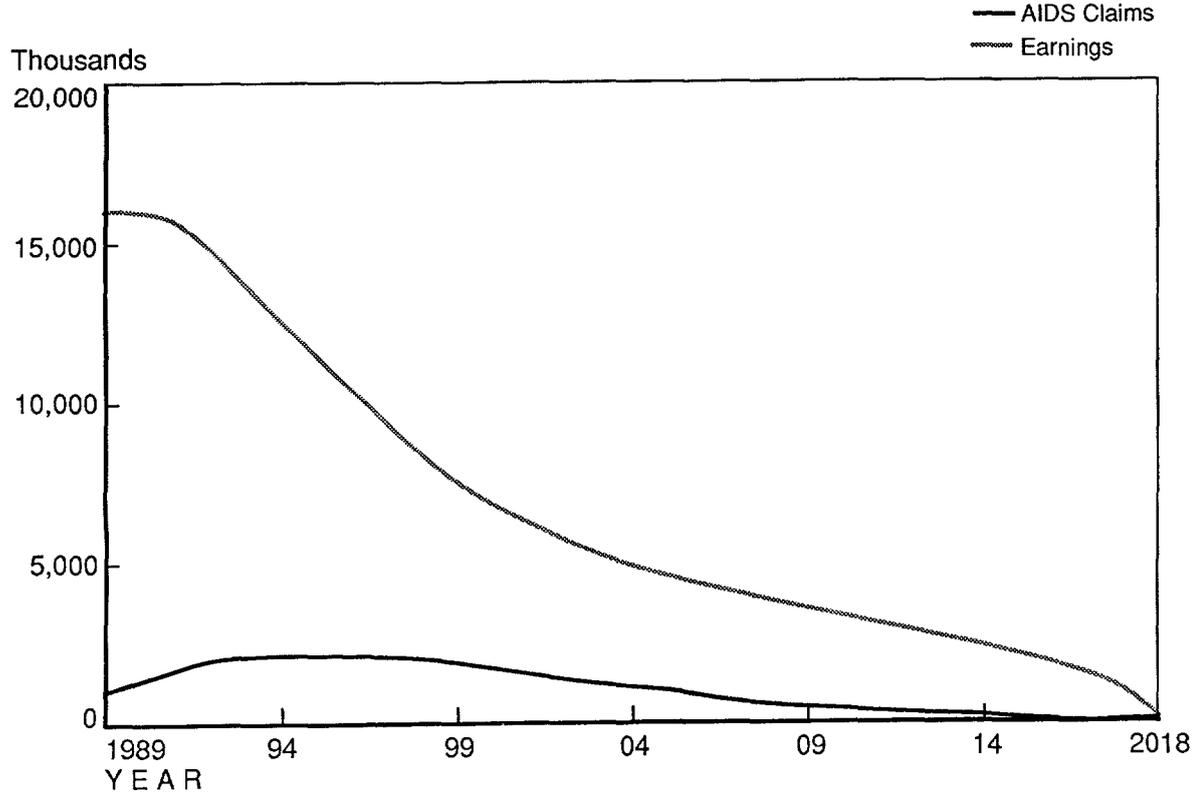
But how do the patterns of AIDS claims and projected benefits compare (Chart 15)? Note that in this case the projected statutory profits from the existing business provides sufficient margin to cover projected AIDS claims.

I earlier mentioned the "High" scenario for AIDS claims. Under the projection assumptions used, projected profits are still sufficient to cover the higher level of AIDS claims, but the margin in reserves is reduced by \$11 million to about \$14 million, or about 5% of the reserves (Chart 16).

There is more which I feel I should do as the time and resources will allow. I would like to do several sensitivity tests on the Gross Premium Valuation assumptions and examine the timing of profits. I would like to expand my model cells to more adequately examine the potential antiselection issue. I need to move on to our other lines of business not yet addressed, such as credit insurance or disability income.

Before I conclude, I would like to say thanks to those who have taken the time to serve on the committees and task forces which have been studying the AIDS risk. It is through their efforts that those of us in small- and medium-sized companies, with limited resources, are able to begin to address the AIDS reserve question.

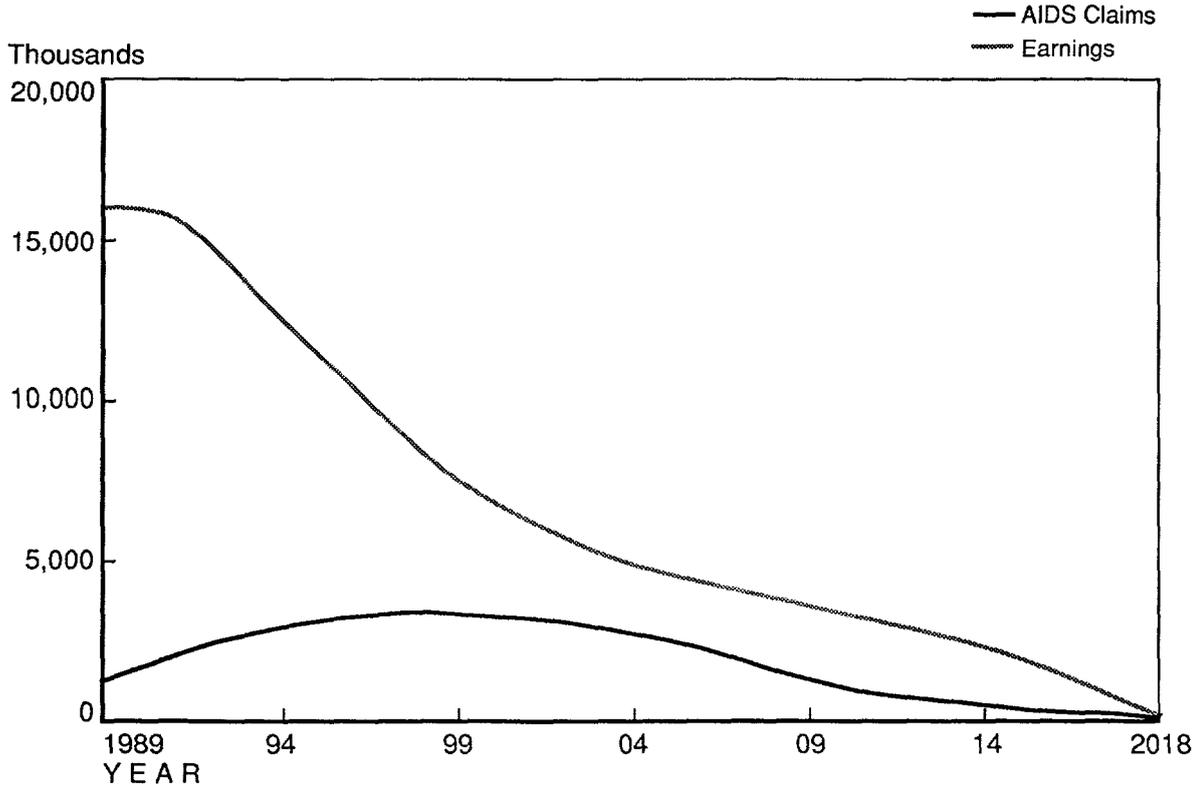
**PROJECTED EARNINGS WITHOUT AIDS CLAIMS
VS.
PROJECTED AIDS CLAIMS
Middle Scenario**



879

RESERVING FOR AIDS
CHART 15

**PROJECTED EARNINGS WITHOUT AIDS CLAIMS
VS.
PROJECTED AIDS CLAIMS
High Scenario**



880

PANEL DISCUSSION
CHART 16

RESERVING FOR AIDS

RESERVING FOR AIDS -- A LARGE-COMPANY CASE STUDY

MR. JOHN EDWARD HANRAHAN: Since we're all earning continuing education credits for being here, it is only fair that we take a very short test.

For a group of males, issued at age 25 in 1989, what do you expect the ratio of AIDS claims to non-AIDS claims to be in year 1, in year 3, and in year 9?

Actually, like the official actuarial exams, almost any answer is acceptable -- as long as it's supported by sound reasoning. However, using the SOA's Task Force on the Financial Implications of AIDS recommendations, the answers might be .30 in year 1, 1.00 in year 3, and 4.00 in year 9.

As you can see, AIDS claims are a pretty serious issue.

My contribution to this panel and to you is to describe one of the techniques we have used at Prudential to evaluate and address the financial implications of AIDS. Before I get into specifics, I would like to provide a little background.

We have been monitoring our individual life AIDS claims for several years. In 1988, we began setting aside funds in order to meet the anticipated claims. Paul Sarnoff, who served on the Society's AIDS Task Force, provided much of the impetus and initial direction for us to get started. To determine our AIDS liability, he laid out a few ground rules.

First, he wanted to make use of the Task Force's recommendations.

1. Start with the Middle Scenario Population AIDS Mortality Rates. This is the Task Force's "best estimate" of future population AIDS mortality.
2. Determine our geographic adjustment factor using the state AIDS Incidence Multipliers provided in the Task Force Report to reflect our inforce distribution. Alf has already shown you how that is done.
3. Use the recommended insured adjustment factors for untested business of 40% for 1983 and earlier issue years and 80% for 1984 and later. The majority of our earlier business was not tested. The reasons for the adjustments downward from the population is the underrepresentation of high risk individuals in insured groups.

So far, no problem. The Society Committee on HIV Research and the Task Force on Financial Implications of AIDS had done an excellent job spelling this all out for us on how to do it. But then things got a little hairy.

Additional specifications were:

4. Let's go with the limited AIDS extra funding period. And again Alf showed you what the slope of the claims would be and why you cannot fund it over a level period for life.

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5. How about the lapse rate antiselection issue -- can't we recognize that as well?

At this point, it was time to call in the actuarial students.

Two last constraints:

6. We should be able to reflect emerging experience which is really the key to this whole thing. We really are looking at the very beginning of AIDS claims. And, finally,
7. Let's develop "statutory," i.e., single decrement, CRVM reserve factors which reflect lapse rate antiselection.

Did you ever hear of the game Twister, remember with the little dots and you had to put your right arm somewhere and your left leg somewhere else. That is kind of like what this is, what this seemed like to me. We were trying get everything built into a single set of numbers.

Incidentally, after laying out all these ground rules and right before this panel was formed, Paul Sarnoff retired. Which brings us to the real reason I'm here. I want to provide you with an AIDS reserve factor calculation procedure. Tables 1 and 2 illustrate a worksheet we have developed. What I would like to do is walk you through that calculation worksheet.

The five pages of the Appendix contain complete descriptions of the columns in Table 1. This way, if you are interested in using this model, but a big lunch and a long day of meetings have taken their toll, you have what you need.

What I want to show you is not so much the detail of the assumptions, but rather how the worksheet would work, and how you could replace it with your own data and your own assumptions.

Table 1 starts with 100,000 insureds at the beginning of year 1. We then subject these insureds to death by AIDS and all other causes. The non-AIDS deaths are pretty straightforward -- mortality rate times beginning of year inforce.

For the AIDS deaths, a few clarifications are needed:

1. We assumed these are "additional" deaths. All insureds in force at the beginning of the year are subject to the AIDS rates. I think this makes these rates "probabilities."
2. As I mentioned earlier, the recommended adjustment for untested business issued in 1984 and later is 80% of the population q_x 's. For tested business, a further reduction is appropriate.
3. Also mentioned earlier was a geographic adjustment to recognize the significant differences in AIDS incidence rates by state. Using Appendix 4 of the Task Force

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Report, we determined our inforce distribution was slightly worse than average (1.05). The calculation is a straightforward weighted average and Alf has shown you an example.

So the final AIDS deaths are just the product of the population AIDS mortality rates times the beginning of year inforce times .8 times 1.05.

Next we segregated the group of people expected to die from AIDS -- our "at risk" group. This is the group we expected to select against us with respect to lapses. By splitting the inforce into two groups, we can see the effect of lapsing each group at different rates.

Now, there are two sets of service tables. The "not at risk" group and the "at risk" group. Columns I to L and M to P represent those two groups, respectively. Again I have taken liberties with rates versus probabilities, but the key is the actual assumptions used. Undoubtedly, anyone using this worksheet would want to reflect their own company's lapse and mortality experience.

These numbers are just illustrative, but let's take a look at them anyway. I won't deny that there is a certain amount of conservatism in this example, but these assumptions are not outside the range of possible outcomes.

In the third year, AIDS claims are nearly equal to those from all other causes. Also, cumulative insured AIDS deaths exceed insured deaths for all other causes for over 30 years. Remember, this example is for an insured group of males aged 25. For females, and males at older ages, the numbers are not nearly as dramatic. Still I would encourage you to monitor your AIDS claims carefully. If your company is currently experiencing AIDS claims around 2% of your total death claims as my company is, expect that number to reach 10 to 15% within 10 years.

Now, off the soap box and back to the worksheet.

AIDS deaths in service, or while insured, are our real concern. We split this group out and calculated a reserve for them as a separate, highly sub-standard group. The "statutory" or single decrement q_x 's for this group are simply the insured AIDS deaths each year divided by the remaining insured AIDS deaths (columns P divided by Q).

By using these highly substandard q_x 's, we can develop reserves using regular statutory reserve formulas. If you can imagine being required to accept HIV+ applicants for life insurance, this might be the proper reserve.

However, we don't know which insureds are "at risk," only the assumed percentage of our inforce. Column T shows us the percentage of our beginning of year inforce which is expected to die from AIDS, while still insured.

If you turn to Table 2, you will see where the actual reserve factors are calculated. Assuming most of you are "Jordanites," you will recognize the standard commutation functions. These are derived using the q_x 's just developed. CRVM reserve factors for a

PANEL DISCUSSION

15-pay life plan using these "sub-standard" commutation functions are shown. Remember, the limited payment feature is prescribed due to the AIDS claims slope. The use of the 15 year funding period avoids negative reserves and better reflects the claim pattern.

The last two steps are to subtract the "standard" reserve already being held and to multiply the remainder by the average percent at risk. These factors can then be applied to the entire inforce represented by that cell.

You can create as many cells as your valuation procedures can support, but remember, AIDS claim data are still in their infancy. You will want to review your company's emerging claims carefully. Remember, the last specification we had was to be able to reflect emerging experience. The insured "at risk" percent allows that. As our AIDS claims emerge, we can compare them to expected and adjust the percent accordingly.

One more note about the worksheet. AIDS claims can be projected using column P and starting with the amount of sales as the initial life table value for each block.

I encourage you to monitor your company's AIDS claims, and to fill in the worksheet with your own company's experience to see what kind of extra reserves you ought to be establishing.

SAMPLE CALCULATION — INSURED AIDS ANTI-SELECTION TABLES FOR 1989 ISSUES

MALE AGE 25

POLICY YEAR	A	B	C	1989 Y.O.I.		F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
				D	E															
	LIFE TABLE	BASIC MORTALITY RATE/AM	BOA AIDS MORTALITY RATE/AM	NON AIDS DEATHS	AIDS DEATHS @60%*1.06	LIFE TABLE NOT @ RISK	LIFE TABLE NOT @ RISK	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	LAPSE RATES NOT @ RISK	NON AIDS DEATHS SERVICE	NON AIDS DEATHS IN SERVICE	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	LAPSE RATES NOT @ RISK	AIDS DEATHS IN SERVICE	REMAINING INSURED AIDS DEATHS	INSURED AIDS STAT	SERVICE TABLE TOTALS	INSURED AIDS PERCENT
1	100,000	0.68	0.230	68	19	97,751	2,249	97,751	0.200	19,550	68	2,249	0.020	45	19	1,729	11,172	100,000	0.01729	
2	99,913	0.68	0.374	88	31	97,883	2,230	78,133	0.180	14,064	54	2,185	0.020	44	31	1,710	17,988	80,318	0.02129	
3	99,813	0.71	0.554	71	46	97,815	2,198	64,015	0.160	10,242	46	2,110	0.020	42	45	1,679	26,553	66,125	0.02539	
4	99,696	0.73	0.760	73	64	97,544	2,152	53,726	0.140	7,522	40	2,023	0.020	40	60	1,635	36,613	55,749	0.02932	
5	99,560	0.76	0.986	76	82	97,471	2,088	46,164	0.120	5,540	36	1,923	0.020	38	76	1,575	48,223	48,087	0.03275	
6	99,401	0.80	1.210	80	101	97,396	2,006	40,589	0.100	4,059	33	1,809	0.020	36	91	1,499	60,785	42,397	0.03535	
7	99,221	0.85	1.406	84	117	97,316	1,905	36,497	0.080	2,920	32	1,681	0.020	34	103	1,408	73,485	38,178	0.03687	
8	99,019	0.90	1.585	89	132	97,232	1,788	33,545	0.080	2,684	31	1,544	0.020	31	114	1,304	87,328	35,090	0.03717	
9	98,798	0.97	1.710	96	142	97,143	1,656	30,831	0.060	1,850	30	1,400	0.020	28	120	1,190	100,775	32,230	0.03693	
10	98,561	1.07	1.766	105	146	97,047	1,514	28,951	0.060	1,737	31	1,252	0.020	25	121	1,070	112,935	30,202	0.03544	
11	98,309	1.15	1.762	113	145	96,941	1,368	27,182	0.060	1,631	32	1,106	0.020	22	117	950	123,192	28,288	0.03357	
12	98,051	1.26	1.678	124	138	96,828	1,223	25,519	0.040	1,021	33	967	0.020	19	109	833	131,212	26,486	0.03143	
13	97,790	1.40	1.598	137	131	96,705	1,085	24,466	0.040	979	35	838	0.020	17	101	723	140,210	25,304	0.02859	
14	97,521	1.58	1.493	154	122	96,568	953	23,453	0.040	938	37	720	0.020	14	92	622	148,485	24,173	0.02573	
15	97,245	1.75	1.347	170	110	96,414	831	22,477	0.040	899	40	613	0.020	12	81	530	153,279	23,090	0.02293	
16	96,965	1.79	1.178	174	96	96,244	721	21,539	0.040	862	39	520	0.020	10	69	448	153,968	22,058	0.02033	
17	96,695	1.97	1.002	190	81	96,070	625	20,638	0.040	826	41	440	0.020	9	57	379	151,053	21,078	0.01800	
18	96,424	2.19	0.864	211	70	95,880	544	19,772	0.040	791	44	374	0.020	7	48	322	149,475	20,146	0.01599	
19	96,142	2.45	0.756	236	61	95,668	474	18,937	0.040	757	47	319	0.020	6	41	274	149,809	19,256	0.01423	
20	95,846	2.74	0.663	263	53	95,433	413	18,133	0.040	725	50	271	0.020	5	35	233	150,516	18,404	0.01265	
21	95,530	3.07	0.577	293	46	95,170	359	17,359	0.040	694	53	231	0.020	5	30	198	150,164	17,589	0.01125	
22	95,190	3.43	0.497	327	40	94,877	313	16,610	0.040	664	57	196	0.020	4	25	168	148,176	16,806	0.01000	
23	94,824	3.82	0.422	362	34	94,551	273	15,889	0.040	636	61	167	0.020	3	21	143	143,762	16,056	0.00892	
24	94,428	4.24	0.359	400	28	94,188	240	15,182	0.040	608	65	144	0.020	3	17	123	138,995	15,336	0.00800	
25	93,999	4.69	0.307	441	24	93,788	211	14,520	0.040	581	68	124	0.020	2	14	106	134,304	14,644	0.00721	
26	93,534	5.18	0.265	485	21	93,347	187	13,871	0.040	555	72	107	0.020	2	12	91	130,243	13,978	0.00654	
27	93,029	5.72	0.231	532	18	92,863	166	13,244	0.040	530	76	93	0.020	2	9	79	126,907	13,337	0.00596	
28	92,479	6.31	0.204	584	16	92,330	148	12,639	0.040	506	80	81	0.020	2	9	69	124,742	12,719	0.00546	
29	91,879	6.94	0.184	638	14	91,747	132	12,053	0.040	482	84	71	0.020	1	8	61	124,854	12,124	0.00501	
30	91,227	7.64	0.171	697	13	91,109	118	11,487	0.040	459	88	62	0.020	1	7	53	128,697	11,549	0.00460	
31	90,517	8.42	0.163	762	12	90,412	105	10,940	0.040	438	92	54	0.020	1	6	46	136,558	10,993	0.00421	

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RESERVING FOR AIDS
TABLE 1

SAMPLE CALCULATION — INSURED AIDS ANTI-SELECTION TABLES FOR 1989 ISSUES

MALE AGE 25

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	
POLICY YEAR	LIFE TABLE	BASIC MORTALITY RATE\$M	1989 Y.O.I.		NON AIDS DEATHS	AIDS DEATHS @80%*1.06	LIFE TABLE NOT @ RISK	LIFE TABLE @ RISK	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	LAPSES NOT @ RISK	NON AIDS DEATHS IN SERVICE	SERVICE TABLE @ RISK	LAPSE RATES @ RISK	LAPSES @ RISK	AIDS DEATHS IN SERVICE	REMAINING INSURED AIDS DEATHS	INSURED AIDS STAT CR\$M	SERVICE TABLE TOTALS	INSURED @ RISK PERCENT
			80A AIDS MORTALITY RATE\$M	80A AIDS DEATHS																
32	89,743	9.28	0.147	833	11	89,850	93	10,410	0.040	416	97	46	0.020	1	6	40	137,823	10,456	0.00383	
33	88,899	10.24	0.132	910	10	88,817	82	9,897	0.040	396	101	40	0.020	1	5	34	138,397	9,837	0.00347	
34	87,979	11.32	0.119	996	9	87,907	72	9,399	0.040	376	106	34	0.020	1	4	30	140,967	9,434	0.00315	
35	86,974	12.53	0.107	1,090	8	86,911	63	8,917	0.040	357	112	29	0.020	1	4	25	142,700	8,946	0.00285	
36	85,876	13.87	0.096	1,191	7	85,821	55	8,449	0.040	338	117	25	0.020	1	3	22	144,640	8,474	0.00258	
37	84,678	15.32	0.087	1,297	6	84,630	48	7,993	0.040	320	123	21	0.020	0	3	19	146,514	8,015	0.00233	
38	83,376	16.89	0.078	1,408	5	83,333	42	7,551	0.040	302	128	18	0.020	0	2	16	148,632	7,569	0.00211	
39	81,961	18.61	0.070	1,525	5	81,925	37	7,121	0.040	285	133	16	0.020	0	2	14	150,909	7,137	0.00190	
40	80,431	20.49	0.063	1,648	4	80,399	32	6,704	0.040	268	137	13	0.020	0	2	12	153,354	6,717	0.00172	
41	78,779	22.56	0.057	1,777	4	78,751	28	6,298	0.040	252	142	11	0.020	0	2	10	155,981	6,310	0.00155	
42	76,998	24.85	0.051	1,913	3	76,974	24	5,904	0.020	118	147	9	0.020	0	1	8	158,801	5,914	0.00139	
43	75,081	27.37	0.046	2,055	3	75,061	20	5,639	0.020	113	154	8	0.020	0	1	7	161,823	5,647	0.00123	
44	73,023	30.13	0.041	2,200	3	73,006	18	5,372	0.020	107	162	7	0.020	0	1	6	165,058	5,379	0.00108	
45	70,821	33.13	0.037	2,346	2	70,806	15	5,103	0.020	102	169	6	0.020	0	1	5	168,517	5,108	0.00095	
46	68,472	36.34	0.034	2,488	2	68,459	13	4,832	0.020	97	176	5	0.020	0	1	4	172,216	4,836	0.00083	
47	65,982	39.80	0.030	2,626	2	65,971	11	4,560	0.020	91	181	4	0.020	0	1	3	176,181	4,563	0.00073	
48	63,354	43.57	0.027	2,760	1	63,345	9	4,287	0.020	86	187	3	0.020	0	0	3	180,438	4,290	0.00064	
49	60,592	47.72	0.024	2,891	1	60,585	8	4,014	0.020	80	192	3	0.020	0	0	2	185,012	4,017	0.00056	
50	57,700	52.31	0.022	3,018	1	57,693	7	3,742	0.020	75	196	2	0.020	0	0	2	189,321	3,745	0.00049	
51	54,680	57.37	0.020	3,137	1	54,675	5	3,472	0.020	69	199	2	0.020	0	0	1	195,177	3,474	0.00043	
52	51,542	62.94	0.018	3,244	1	51,538	5	3,203	0.020	64	202	1	0.020	0	0	1	200,790	3,205	0.00037	
53	48,298	69.02	0.016	3,333	1	48,294	4	2,937	0.020	59	203	1	0.020	0	0	1	206,768	2,939	0.00033	
54	44,963	75.60	0.014	3,399	1	44,960	3	2,676	0.020	54	202	1	0.020	0	0	1	213,119	2,677	0.00028	
55	41,564	82.69	0.013	3,437	0	41,561	3	2,420	0.020	48	200	1	0.020	0	0	1	219,856	2,421	0.00025	
56	38,126	90.24	0.012	3,441	0	38,124	2	2,172	0.020	43	196	1	0.020	0	0	0	227,000	2,172	0.00021	
57	34,685	98.24	0.011	3,407	0	34,684	2	1,932	0.020	39	190	0	0.020	0	0	0	234,590	1,933	0.00019	
58	31,278	106.88	0.009	3,343	0	31,276	1	1,704	0.020	34	182	0	0.020	0	0	0	242,690	1,704	0.00016	
59	27,934	116.39	0.009	3,251	0	27,933	1	1,488	0.020	30	173	0	0.020	0	0	0	251,342	1,488	0.00014	
60	24,683	126.68	0.008	3,127	0	24,682	1	1,285	0.020	26	163	0	0.020	0	0	0	260,542	1,285	0.00012	
61	21,556	137.84	0.007	2,971	0	21,555	1	1,096	0.020	22	151	0	0.020	0	0	0	270,310	1,096	0.00011	
62	18,585	149.84	0.006	2,785	0	18,584	1	923	0.020	18	138	0	0.020	0	0	0	280,646	923	0.00009	

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PANEL DISCUSSION
TABLE 1
(Continued)

SAMPLE CALCULATION — INSURED AIDS ANTI-SELECTION TABLES FOR 1989 ISSUES

MALE AGE 25

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
POLICY YEAR	LIFE TABLE	BASIC MORTALITY RATES/M	1989 Y.O.I. SOA AIDS MORTALITY RATES/M	NON AIDS DEATHS	AIDS DEATHS @90%*1.06	LIFE TABLE NOT @ RISK	LIFE TABLE @ RISK	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	NON AIDS LAPSES NOT @ RISK	DEATHS IN SERVICE @ RISK	LAPSE RATES @ RISK	LAPSE RATES @ RISK	LAPSE RATES @ RISK	AIDS DEATHS IN SERVICE	REMAINING INSURED AIDS STAT @/M	INSURED AIDS STAT @/M	SERVICE TABLE TOTALS	INSURED @ RISK PERCENT
64	13,231	175.87	0.005	2,327	0	13,230	1	626	0.020	13	110	0	0.020	0	0	0	303,069	627	0.00007
65	10,904	189.57	0.005	2,067	0	10,903	0	504	0.020	10	95	0	0.020	0	0	0	315,307	504	0.00006
66	8,837	203.69	0.004	1,800	0	8,836	0	398	0.020	8	81	0	0.020	0	0	0	328,503	398	0.00005
67	7,037	218.23	0.004	1,536	0	7,036	0	309	0.020	6	67	0	0.020	0	0	0	343,045	309	0.00004
68	5,501	233.19	0.003	1,283	0	5,501	0	235	0.020	5	55	0	0.020	0	0	0	359,613	236	0.00004
69	4,218	248.57	0.003	1,049	0	4,218	0	176	0.020	4	44	0	0.020	0	0	0	379,456	176	0.00003
70	3,170	264.37	0.003	838	0	3,169	0	129	0.020	3	34	0	0.020	0	0	0	405,014	129	0.00003
71	2,332	280.59	0.002	654	0	2,331	0	92	0.020	2	26	0	0.020	0	0	0	441,469	92	0.00002
72	1,677	297.23	0.002	499	0	1,677	0	64	0.020	1	19	0	0.020	0	0	0	501,383	64	0.00002
73	1,179	314.29	0.002	371	0	1,179	0	44	0.020	1	14	0	0.020	0	0	0	623,161	44	0.00001
74	808	331.77	0.002	268	0	808	0	29	0.020	1	10	0	0.020	0	0	0	1000,000	29	0.00001
75	540	1000.00	0.000	540	0	540	0	19	0.020	0	19	0	0.020	0	0	0	1000,000	19	0.00000
SUM OF DEATHS				97761	2249	SUM OF LAPSES AND DEATHS				97761	2249								
TOTAL				100000					100000										

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RESERVING FOR AIDS
TABLE 1
(Continued)

SAMPLE CALCULATION
 INSURED AIDS MORTALITY TABLE FOR 1989 ISSUES: 8.16%

i = 0.0816
 d = 0.0754437
 delta = 0.0784414
 v = 0.9245562

age	lx	dx	AIDS		- Dx	- Nx	- Cx	- Mx	15 PL	STD CRVM	INSURED	MEAN	AVERAGE
			Qx'S/M	Dx					AIDS	RESERVE			
									MALE 25, 8.16%	80 CSO	PERCENT	PERCENT	RESERVE
25	1,729	19	11.172	1729.3	1654.1	12234.8	18.582	769.593	5.40	0.84	0.01729	0.01929	0.09
26	1,710	31	17.988	1581.0	1507.1	10580.8	27.348	751.011	86.01	3.64	0.02129	0.02334	1.46
27	1,679	45	26.553	1435.4	1362.5	9073.7	36.658	723.683	124.64	6.69	0.02539	0.02736	3.23
28	1,635	80	36.613	1291.9	1220.1	7711.2	45.492	687.004	180.61	10.00	0.02932	0.03104	5.29
29	1,575	76	48.223	1150.7	1080.4	6491.2	53.369	641.513	233.27	13.59	0.03275	0.03405	7.48
30	1,499	91	60.785	1012.6	944.7	5410.8	59.197	588.143	282.24	17.44	0.03535	0.03611	9.56
31	1,408	103	73.485	879.9	815.0	4466.1	62.144	528.946	327.74	21.57	0.03687	0.03702	11.33
32	1,304	114	87.328	753.2	693.2	3651.1	63.262	466.802	389.89	25.99	0.03717	0.03705	12.74
33	1,190	120	100.775	635.8	580.9	2957.9	61.601	403.540	408.98	30.70	0.03693	0.03619	13.69
34	1,070	121	112.935	528.4	479.9	2377.0	57.394	341.938	446.17	35.72	0.03544	0.03451	14.16
35	950	117	123.192	433.4	391.5	1897.2	51.347	284.544	483.28	41.05	0.03357	0.03250	14.37
36	833	109	131.212	351.3	316.0	1505.7	44.334	233.198	522.62	46.69	0.03143	0.03001	14.28
37	723	101	140.210	282.2	252.6	1189.7	38.053	188.864	566.06	52.64	0.02859	0.02716	13.94
38	622	92	148.485	224.3	199.9	937.1	32.035	150.810	615.43	58.91	0.02573	0.02433	13.54
39	530	81	153.279	176.8	157.0	737.1	26.034	118.776	674.44	65.62	0.02293	0.02163	13.17
40	448	69	153.968	138.2	122.9	580.1	20.471	92.742	669.57	72.46	0.02033	0.01917	11.44
41	379	57	151.053	108.1	96.3	457.3	15.711	72.271	687.34	79.72	0.01800	0.01700	9.99
42	322	48	149.475	84.9	75.6	361.0	12.202	56.560	665.48	87.34	0.01599	0.01511	8.74
43	274	41	149.809	66.7	59.4	285.4	9.617	44.358	663.38	95.33	0.01423	0.01344	7.63
44	233	35	150.516	52.5	46.7	228.0	7.595	34.741	660.48	103.68	0.01265	0.01195	6.65
45	198	30	150.164	41.2	38.7	179.2	5.951	27.146	656.71	112.43	0.01125	0.01063	5.78
46	168	25	148.176	32.4	28.9	142.5	4.614	21.195	652.45	121.59	0.01000	0.00948	5.02
47	143	21	143.762	25.5	22.8	113.7	3.526	16.581	648.51	131.18	0.00892	0.00846	4.38
48	123	17	138.995	20.2	18.1	90.9	2.698	13.055	645.65	141.22	0.00800	0.00761	3.84
49	106	14	134.304	16.1	14.4	72.8	2.076	10.357	644.21	151.72	0.00721	0.00688	3.39
50	91	12	130.243	12.9	11.6	58.4	1.611	8.281	644.42	162.70	0.00654	0.00625	3.01
51	79	10	126.907	10.3	9.3	46.8	1.262	6.670	646.35	174.14	0.00596	0.00571	2.70
52	69	9	124.742	8.3	7.5	37.5	1.002	5.408	649.98	186.03	0.00548	0.00524	2.43
53	61	8	124.654	6.8	6.1	30.0	0.811	4.406	654.93	198.35	0.00501	0.00481	2.19

PANEL DISCUSSION
 TABLE 2

SAMPLE CALCULATION
 INSURED AIDS MORTALITY TABLE FOR 1989 ISSUES: 8.16%

i = 0.0816
 d = 0.0754437
 delta = 0.0784414
 v = 0.9245562

age	lx	dx	AIDS		- Dx	- Nx	- Cx	- Mx	AIDS	STD CRVM	INSURED	MEAN	AVERAGE
			Cx'S/M	Dx					INSURED	RESERVE	@RISK	PERCENT	EXCESS
								MEAN RESERVE	80 CSO MALE 25, 8.16%	PERCENT	PERCENT	RESERVE	
54	53	7	128.697	5.5	4.9	23.9	0.677	3.595	660.19	211.09	0.00460	0.00441	1.98
55	46	6	136.558	4.4	3.9	18.9	0.578	2.918	664.19	224.25	0.00421	0.00402	1.77
56	40	6	137.923	3.5	3.2	15.0	0.466	2.340	667.19	237.82	0.00383	0.00365	1.57
57	34	5	139.397	2.8	2.5	11.8	0.376	1.874	670.34	251.84	0.00347	0.00331	1.39
58	30	4	140.987	2.2	2.0	9.3	0.302	1.498	673.65	266.34	0.00315	0.00300	1.22
59	25	4	142.700	1.8	1.6	7.3	0.243	1.196	677.11	281.32	0.00285	0.00272	1.07
60	22	3	144.540	1.4	1.3	5.7	0.195	0.953	680.72	296.76	0.00258	0.00246	0.94
61	19	3	146.514	1.1	1.0	4.5	0.156	0.758	684.50	312.64	0.00233	0.00222	0.83
62	16	2	148.632	0.9	0.8	3.5	0.125	0.601	688.43	328.92	0.00211	0.00201	0.72
63	14	2	150.909	0.7	0.6	2.7	0.100	0.476	692.53	345.54	0.00190	0.00181	0.63
64	12	2	153.354	0.5	0.5	2.1	0.080	0.376	696.79	362.47	0.00172	0.00164	0.55
65	10	2	155.981	0.4	0.4	1.6	0.064	0.296	701.21	379.67	0.00155	0.00147	0.47
66	8	1	158.801	0.3	0.3	1.2	0.050	0.233	705.78	397.14	0.00139	0.00131	0.40
67	7	1	161.823	0.3	0.2	1.0	0.040	0.182	710.51	414.90	0.00123	0.00116	0.34
68	6	1	165.058	0.2	0.2	0.7	0.032	0.142	715.40	432.98	0.00108	0.00102	0.29
69	5	1	168.517	0.2	0.1	0.6	0.025	0.110	720.44	451.36	0.00095	0.00089	0.24
70	4	1	172.216	0.1	0.1	0.4	0.020	0.085	725.63	469.98	0.00083	0.00078	0.20
71	3	1	176.181	0.1	0.1	0.3	0.015	0.066	730.96	488.75	0.00073	0.00069	0.17
72	3	0	180.438	0.1	0.1	0.2	0.012	0.051	736.44	507.52	0.00064	0.00060	0.14
73	2	0	185.012	0.1	0.0	0.2	0.009	0.039	742.04	526.16	0.00056	0.00053	0.11
74	2	0	189.921	0.0	0.0	0.1	0.007	0.029	747.77	544.53	0.00049	0.00046	0.09
75	1	0	195.177	0.0	0.0	0.1	0.006	0.022	753.60	562.58	0.00043	0.00040	0.08
76	1	0	200.790	0.0	0.0	0.1	0.004	0.017	759.51	580.31	0.00037	0.00035	0.06
77	1	0	206.768	0.0	0.0	0.0	0.003	0.012	765.51	597.80	0.00033	0.00031	0.05
78	1	0	213.119	0.0	0.0	0.0	0.002	0.009	771.58	615.11	0.00028	0.00027	0.04
79	1	0	219.858	0.0	0.0	0.0	0.002	0.007	777.71	632.31	0.00025	0.00023	0.03
80	0	0	227.000	0.0	0.0	0.0	0.001	0.005	783.90	649.40	0.00021	0.00020	0.03
81	0	0	234.590	0.0	0.0	0.0	0.001	0.004	790.15	666.27	0.00019	0.00018	0.02
82	0	0	242.690	0.0	0.0	0.0	0.001	0.003	796.45	682.76	0.00016	0.00015	0.02

(Continued)

TABLE 2

RESERVING FOR AIDS

SAMPLE CALCULATION
 INSURED AIDS MORTALITY TABLE FOR 1989 ISSUES: 8.16%

l = 0.0816
 d = 0.0754437
 delta = 0.0784414
 v = 0.9245562

age	lx	dx	AIDS Qx'SAM	Dx	- Dx	- Nx	- Cx	- Mx	AIDS INSURED MEAN RESERVE	STD CRVM RESERVE 80 CSO MALE 25, & 16%	INSURED @RISK PERCENT	MEAN PERCENT	AVERAGE MEAN EXCESS RESERVE
83	0	0	251.342	0.0	0.0	0.0	0.001	0.002	802.80	696.70	0.00014	0.00013	0.01
84	0	0	260.542	0.0	0.0	0.0	0.000	0.001	808.18	714.00	0.00012	0.00012	0.01
85	0	0	270.310	0.0	0.0	0.0	0.000	0.001	815.59	728.62	0.00011	0.00010	0.01
86	0	0	280.646	0.0	0.0	0.0	0.000	0.001	822.04	742.62	0.00009	0.00009	0.01
87	0	0	291.556	0.0	0.0	0.0	0.000	0.000	828.57	756.13	0.00008	0.00008	0.01
88	0	0	303.069	0.0	0.0	0.0	0.000	0.000	835.25	769.36	0.00007	0.00007	0.00
89	0	0	315.307	0.0	0.0	0.0	0.000	0.000	842.18	782.53	0.00006	0.00006	0.00
90	0	0	328.503	0.0	0.0	0.0	0.000	0.000	849.53	795.97	0.00005	0.00005	0.00
91	0	0	343.045	0.0	0.0	0.0	0.000	0.000	857.52	810.06	0.00004	0.00004	0.00
92	0	0	359.613	0.0	0.0	0.0	0.000	0.000	866.48	825.29	0.00004	0.00004	0.00
93	0	0	379.456	0.0	0.0	0.0	0.000	0.000	876.85	842.23	0.00003	0.00003	0.00
94	0	0	405.014	0.0	0.0	0.0	0.000	0.000	889.26	861.29	0.00003	0.00003	0.00
95	0	0	441.469	0.0	0.0	0.0	0.000	0.000	904.53	882.75	0.00002	0.00002	0.00
96	0	0	501.383	0.0	0.0	0.0	0.000	0.000	923.72	906.12	0.00002	0.00002	0.00
97	0	0	623.161	0.0	0.0	0.0	0.000	0.000	948.11	930.10	0.00001	0.00001	0.00
98	0	0	1000.000	0.0	0.0	0.0	0.000	0.000	980.89	952.03	0.00001	0.00001	0.00
99	0	0	1000.000	0.0	0.0	0.0	0.000	0.000	1000.00	982.08	0.00000	0.00000	0.00

(Continued)

TABLE 2

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CALCULATION OF AIDS RESERVE FACTORS DEFINITION OF COLUMNS FOR THE AIDS ANTI-SELECTION TABLES

Column A: Policy Year

Column B: Life Table

The total number of people still alive at the beginning of each year out of 100,000 originally issued ($B_1 = 100,000$). The Life Table for a given year equals the prior year value minus the AIDS and non-AIDS deaths from that prior year.

$$B_t = B_{t-1} - E_{t-1} - F_{t-1} \quad t > 1$$

Note: The Life Table equals the sum of the at Risk and Not at Risk Life Tables, also.

Column C: Basic Mortality Rates per Thousand

These numbers are from the 75-80 Select Basic Table found in Transactions Society of Actuaries, 1982 Reports. The mortality rates begin with the rate for a male age 25.

Column D: SOA AIDS Mortality Rates per Thousand

These are taken from the Society's study SOA Committee on HIV Research: Middle Scenario for the male general population. These extra AIDS qx's are assumed to begin in 1988 for policies issued before 1988 or at the time of issue (at age 25) for policies issued in 1988 and later. All policies are assumed to have an issue age of 25. At durations where the Society's study no longer provides AIDS qx's, the AIDS qx at each new duration decreases by 10 percent from the preceding duration. The values shown are for a 1989 year of issue, male age 25.

Column E: Non AIDS Deaths

The Non AIDS Deaths are the total number of deaths each year due to causes other than AIDS. They are obtained by multiplying the number of lives remaining at the beginning of the policy years by the Basic Mortality Rates.

$$E_t = (B_t * C_t)/1000$$

Column F: AIDS Deaths

The AIDS deaths are the total number of deaths due to AIDS that occur during a given year. These numbers are calculated by multiplying the total number of lives remaining at the beginning of the year by an adjusted SOA AIDS qx for that year. For example, the adjustments to the qx's are .80 to reflect insured

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mortality and 1.05 to reflect geographic distribution. Note that the insured mortality adjustment for pre '84 issues was .40.

$$F_t = (B_t * D_t * .80 * 1.05)/1000$$

Column G: Life Table Not at Risk

The Life Table Not at Risk represents the number of lives that will eventually die from causes other than AIDS in that policy year or later. It is calculated by subtracting the number of Non AIDS deaths occurring in the preceding year from the total number of lives remaining in the not at risk group at the beginning of the preceding year. The starting number of lives not at risk is obtained by summing the Non AIDS deaths (total of Column E).

$$G_t = G_{t-1} - E_{t-1} \quad t > 1$$

Column H: Life Table at Risk

The Life Table at Risk represents the number of lives that will eventually die from AIDS in that policy year or later. It is calculated by subtracting the number of deaths due to AIDS occurring in the preceding year from the total number of lives remaining in the at risk group at the beginning of the preceding year. The starting number of lives at risk is obtained by summing the AIDS deaths (total of Column F).

$$H_t = H_{t-1} - F_{t-1} \quad t > 1$$

Column I: Service Table Not at Risk

The Not at Risk group represents the number of people who will never die from AIDS. The initial value of the Service Table Not at Risk is the sum of Column E, the total Non AIDS Deaths. This is also equal to the sum of Column K plus the sum of Column L, the total Lapses Not at Risk plus Non AIDS Deaths in Service.

The remaining values are calculated by subtracting

1. the number of policy lapses occurring out of the not at risk group during the preceding year, and
2. the number of deaths due to normal mortality occurring out of the not at risk policies in service during the preceding year

from the total number of not at risk policies still in service at the beginning of the preceding year.

$$I_t = I_{t-1} - K_{t-1} - L_{t-1} \quad t > 1$$

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Column J: Lapse Rate Not at Risk

These are "Illustrative" lapse rates.

Column K: Lapses Out of Not at Risk

The Lapses Out of Not at Risk are the number of policies that lapse out of the not at risk group during a given year. This is calculated by multiplying the number of policies from the not at risk group that are still in service at the beginning of the year by that year's lapse rate for not at risk policies.

$$K_t = I_t * J_t$$

Column L: Non AIDS Deaths in Service

Non AIDS Deaths in Service represents the number of Non AIDS deaths occurring out of the policies in service during a given year. It is calculated first by dividing the number of not at risk policies in service at the beginning of the year by the number of not at risk policies that are still alive (i.e. even if they have lapsed) at the beginning of the year. This ratio is then multiplied by the total Non AIDS deaths occurring during that year.

$$L_t = (I_t/G_t) * E_t$$

Column M: Service Table at Risk

The "at Risk" group represents people who will die from AIDS. The Service Table at Risk represents the number of policies out of the group at risk that are still in service at the beginning of a given year. This is calculated by subtracting:

1. the number of policy lapses occurring out of the at risk group during the preceding year, and
2. the number of AIDS deaths occurring out of the policies still in service during the preceding year

from the number of policies at risk and still in service at the beginning of the preceding year.

$$M_t = M_{t-1} - O_{t-1} - P_{t-1} \quad t > 1$$

The beginning number of lives in the service table at risk is the total number of AIDS deaths expected to occur at some time. This beginning number is not reduced due to lapses. It is found by taking the total of Column F, which equals the totals of Column O and Column P.

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Column N: Lapse Rate at Risk

The lapse rates assume that, policyholders who fall into the at risk category will lapse at a rate of 2% per year.

Column O: Lapses Out of at Risk

The Lapses Out of at Risk are the number of policies that lapse out of the at risk group during a given year. This is calculated by multiplying the number of policies from the at risk group that are still in service at the beginning of the year by the lapse rate for the at risk group for that year.

$$O_t = M_t * N_t$$

Column P: AIDS Deaths in Service

AIDS Deaths in Service represents the number of AIDS deaths occurring out of the policies in service during a given year. It is calculated first by dividing the number of at risk policies in service at the beginning of the year, by the number of at risk policies that are still alive (i.e. even if they have lapsed) at the beginning of the year. This ratio is multiplied by the total extra AIDS deaths occurring during that year.

$$P_t = (M_t/H_t) * F_t$$

Column Q: Remaining Insured AIDS Deaths

Remaining Insured AIDS Deaths is the sum of the current year and future years' AIDS Deaths in Service.

$$Q_t = \sum_{z=t}^w F_z$$

Column R: Insured AIDS Stat Qx's/M

The Insured AIDS Stat Qx's for a given year represents the mortality rate of the people in service and at risk (all of whom will actually die, while insured, from AIDS). It is calculated by dividing the number of AIDS deaths in Service occurring during that year by the remaining number of in service and at risk deaths.

$$R_t = 1000 * P_t/Q_t$$

Column S: Service Table Totals

The Service Table Total for a given year is the sum of the number of policies in the at risk and the not at risk service tables at the beginning of that year.

$$S_t = I_t + M_t$$

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Column T: Insured at Risk Percentage

The Percent at Risk for a given year represents the percentage of owners of policies in force expected to die from AIDS while still insured (in service). The percentage is calculated by dividing the remaining number of AIDS deaths in Service (Column Q) by the total number of policies in service that year (Column S).

$$T_t = Q_t/S_t$$

