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AIDS – AN ACTUARY’S RESPONSIBILITIES

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- Valuations
- Opinions
- Cash flow projections
- Pricing considerations

MR. DONALD F. BEHAN: We have three actuaries on our panel who have significant involvement in the evaluation and planning for the financial effects of AIDS. They are John Hanrahan, Stephen Conwill, and Kenneth LaSorella. As the panelists share the results of their work with you, I hope it will stimulate an active discussion.

By virtue of our training and experience, we in the actuarial profession have unique qualifications to evaluate emerging demographic information. The evaluation of data concerning AIDS is especially difficult for the general public because of the long latency period and the need to infer future prevalence from limited current information.

Only once or twice in recorded history has mankind faced a communicable disease with such a long latency period and such a devastating effect on the victims. As a result of this lack of comparable experience and the fact that the relationship between our projections and current prevalence is not obvious, we can expect a counter-resistance to the conclusions that we draw, even among experienced people in the insurance industry. This gives us an added responsibility to communicate our results clearly and convincingly. I hope that this session will allow all of us to approach our responsibilities with greater insight.

For the prepared remarks the first speaker will be Stephen H. Conwill. Steve is with Milliman & Robertson in their Seattle office. He joined Milliman & Robertson in 1988 after seven years with Mutual of New York. Steve's recent responsibilities have included international issues, as well as evaluating the effect of AIDS on pricing and cash flow. Steve will talk with us about his work on cash-flow analysis and other matters.

Our second speaker, John Hanrahan, is vice president and assistant actuary at the Prudential. He has been with the Prudential since graduating from Stevens Institute of Technology in 1978. He currently heads the individual insurance valuation area, and will talk with us on estimating the cost of AIDS claims and an approach to reserving.

Our final speaker in the prepared part of this session, Kenneth LaSorella, is a senior manager with KPMG Peat Marwick in Chicago. He joined Peat Marwick in 1987 after 19 years with insurance companies in Canada and the United States. He has had extensive involvement in helping companies to quantify the financial effect of AIDS. He will talk with us about reserving for AIDS.

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MR. STEPHEN H. CONWILL: I'd like to preface the remarks I'm going to make with the disclaimer that I do not claim to be an expert on AIDS. There are plenty of people, including the other panelists, who are more qualified to give a talk on the subject than I am. But with that said, I will add that I have followed the crisis with interest and concern over about the past five years or so. I've had some practical experience in dealing with the issues so I hope I can say a few interesting things and generate some comments from you at the end.

I think everyone here is aware of the basic facts. There's been really a remarkable amount of excellent work done in efforts to assess the course of the epidemic to try to quantify the financial impact on insurance companies and to suggest appropriate means of action which both protect the financial integrity of the industry and respond with sensitivity and fairness to the consumer.

Just to mention some of the efforts, going back to 1987 is the path-breaking report of Cowell and Hoskins. The following year, in 1988, there was the report of the SOA Task Force, the Holland Committee. In 1989, there was the joint report of the SOA Committee on HIV Research and the SOA Task Force on the Financial Implications of AIDS. There's been a lot of work done by the ACLI and the Health Insurance Association of America (HIAA) not to mention the work in Canada by the CIA and over in the U.K. by the Institute.

Despite the truly remarkable amount of superb effort on the subject, there are still a frustrating number of unknowns and we're still a long way from achieving a consensus on the most appropriate course of action in many areas. The most fundamental unknown is simply the course of the epidemic itself. A question that still looms over the head of the industry is whether a heterosexual epidemic may arise or whether the virus over the long term will remain primarily confined to the current high-risk groups. The data at present seem to point against a major heterosexual epidemic and this has been the assumption underlying both the Cowell and Hoskins report and the work of the SOA Task Force. Are we justified in making this leap of faith in pricing and reserving? I think we probably are, but I definitely would be willing to listen to an opposing view.

When they released their initial report in 1987, Coswell and Hoskins were extremely careful to point out that their projections were based on limited data, that some broad assumptions had to be made, and that periodic updates would be necessary. The more recent research done does suggest a considerably more rapid decline in the number of HIV infections than had been projected originally and fewer AIDS deaths over the next decade. Despite this optimism, it's definitely not time to become complacent.

In the areas we tend to address as actuaries, what do we agree on and what are we still debating? The three key categories are underwriting, pricing, and reserving.

I think we tend to find the most agreement on the underwriting side. For individual life insurance, just about everyone is testing at the \$100,000 level or below. In the SOA survey done a little more than a year ago, about 80% were actually testing at \$100,000 or below, 15% were at \$100,001, and the balance were testing at higher levels.

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I think there's still a trend towards lower underwriting levels. And this is being hastened by the introduction of screening tests that do not require drawing of blood -- urine or saliva tests.

However, despite the general agreement, I think the history of the debate on underwriting is quite interesting. As is the case on the pricing and reserving side, there are many conflicting interests. From a coldly actuarial perspective, it was pretty easy to show that testing was cost-effective down to rather low limits. But a blood test is messy and people don't enjoy having needles stuck into their arms, and sales that may once have been rather routine got delayed a few days or in the worst case got canceled all together. So it's very definitely a pain from a marketing perspective.

In addition, there were some other serious issues to deal with: confidentiality -- how to inform those testing positive and obligations with respect to counseling. What may have seemed like a very open-and-shut case from an actuarial viewpoint was very complex when viewed from the broader perspectives. I think it's worth mentioning, because the pricing and reserving issues that we're still grappling with do have broader ramifications than the most obvious financial ones. They may not have quite the social content as the underwriting issue. Nevertheless, there's a need to balance marketing, competition, policyholder equity, and other issues with the obvious need to preserve the long-term financial health of the enterprise.

Let me say a few words on the pricing side. What are the trends in pricing? The survey I mentioned earlier that the SOA did a little more than a year ago showed that about 40% of companies had reflected AIDS in their pricing mortality. The question in the survey was rather generally worded so that we didn't really find out if these companies had come up with different rates as the result of including AIDS in the mortality assumption. But at least we knew they had tried to quantify the financial impacts.

Many companies that I've worked with feel comfortable that testing materially eliminates the pricing risk. There are very few false negatives and to the extent that people become HIV positive after purchasing insurance, this risk will be offset by improved mortality overall. If we discount the likelihood of a heterosexual epidemic, I don't really feel uncomfortable with this point of view. But quite frankly I don't know, and I'm not sure that anyone does, how important is the caveat I just made, and can we ignore the small probability of a huge loss. It's really a classic question in risk analysis.

Related to that decision is the fact that pricing is as much a marketing function as it is an actuarial function. Whether we like it or not, we may make a recommendation to management and advocate a given set of rates with all the eloquence we can muster. But in the end we may see marketing considerations cut our margins below where we might like them. I think it's even true in the sober 1990s. If we really believe in a price hike or rates that don't match the competition, we had better come up with some pretty convincing data. And that's a real dilemma given the uncertainty which exists. It's really tough to go to management and say, we feel uncomfortable with the current rates, because there's a 5% probability of ruin even, if that ruin is ruin in a really big way.

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Let me just touch on the reserving side before we go on to John. I was quite frankly surprised when I saw the results of the SOA survey that approximately 10% of companies had either increased their reserves or allocated surplus to address the AIDS risk. In these days of tight surplus, it really takes some resolve to do this. I would urge you to take the very long perspective, because if you don't, who will? Decisions that we make must be based on the very long-term health of our companies.

With that thought, I'd like to turn it over to John, who's going to take us through an example and provide some concrete advice on how to deal with the issues.

MR. JOHN EDWARD HANRAHAN: My remarks are geared towards pricing and reserving for AIDS on individual life insurance policies. I'll try to give you a tool for analyzing what the cost will be within your own company based on your own experience.

Where do you start? The first steps we took at Prudential when we became aware of the AIDS epidemic were that we began to gather AIDS claim data and we began to underwrite for AIDS. Next we reviewed the available information about the epidemic and participated on the Society's Task Force on the Financial Implications of AIDS. Then, we began to do our first work on AIDS claim projections.

We started with the Cowell and Hoskins report and then with the Society's HIV Research Committee report and using these we began to project our individual life claims. Also, we began to reflect AIDS mortality in our pricing for both new and in-force business. Without a doubt, our chief underwriter and chief medical director were right on top of the situation. If that gives you the idea that we had our act together, that's good. I was trying to do that. But I have to confess that when we did our projections, we were estimating that our AIDS claims would be, five years down the road, somewhere between \$50 and \$150 million. So we still had a lot of work to do.

We did find our efforts had been very much worthwhile however. The need to underwrite and the value of it seemed more and more obvious. We reduced our new business testing limits dramatically in 1987 and 1988 and the resulting effect on AIDS claims was significant. Current claims are much lower than we originally projected with the bulk of the decrease coming from policies in their first few durations. The bad news is that the trend for older business is still sharply increasing as projected.

What I'm going to do is to retrace some of the steps we took to estimate claims for pricing and reserving. Last April at the Society's Hartford meeting, I was part of a panel on reserving for AIDS. I covered reserve factor developments and provided a worksheet that could be used to develop AIDS reserve factors. It's really a pretty simple worksheet and when I'm done I think you'll feel that way too. I view it as a useful tool for quantifying the AIDS epidemic. It's easily adaptable to fit the purpose and circumstances for your company or client. Since use of the worksheet to develop reserve factors was already published in the *Record*, I'm going to concentrate on using it to develop mortality rates for claim projections and pricing.

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Here are general steps for claim projections. First, model your in-force and new business, splitting them by males versus females, tested business versus untested, age group, etc. Second, you select assumptions for the basic mortality, excluding AIDS, lapse rates, and lapse-rate antiselection. You would use industry experience on AIDS mortality, modified to reflect your own experience, to get additional AIDS mortality. Then, you would run the worksheet to project AIDS claims.

I don't know where anybody would get the industry experience for AIDS mortality and that's the heart of the problem. There isn't any published experience and if there was, its applicability even five years from now would be very suspect. However, the Society's Committee on HIV Research has been very helpful. They provided a projection of general population AIDS mortality rates, based on estimates of the population currently infected. They factored in rates of progression from HIV positive to death from AIDS. This is the best source I'm aware of for determining what the slope of the AIDS mortality claims will be. But still it is a U.S. population projection, not insured lives.

MR. R. NEIL VANCE: I'm with the New Jersey State Insurance Department. Could you talk a little bit more about how you model antiselection in lapses? Was that an important part of the modeling?

MR. HANRAHAN: Yes, and one of the things I'll discuss is exactly how we split the in-force into the two groups and reflect the antiselection and the lapses.

First, we wanted age-specific data. Second, we wanted to be able to reflect lapse-rate antiselection by the "at-risk" group. Third, we needed a method for estimating the percent of at-risk individuals in our in-force. Fourth, we wanted a process that would allow us to update our assumptions as more data became available. Finally, we wanted to consolidate this information into a single table of composite mortality rates. That will, hopefully, explain some of the contortions in getting to the final answer.

Okay, claim projection. You allocate your in-force and your new business to cells. The modeled cell shown on Chart 1 is for male, age 25, issued in 1989, and 100% untested. So it's going to show a pretty dramatic impact of AIDS.

You can select mortality and lapse rates appropriate for this cell and your needs. Those are entered in column C and column J. You decide what you think lapse rates on at risk individuals will be. That's entered in column N. Again there's quite a difference. We've shown high lapse rates for the non-at-risk group, and we've shown a level 2% lapse rate for the at-risk group. The final assumption we need is the AIDS mortality rate. We start with the Society's Task Force population mortality rates for the cell. There's a table that's published in the Society's report that's pretty easy to work with.

Next you adjust for your distribution of business by state. This was covered at the Hartford meeting and it was published in the *Record*, Volume 16, No. 2, page 875. For this example, the geographic distribution is slightly worse than average, so 1.05 is the factor that we use. The second adjustment, 0.80 in this example, reflects the lower representation of high-risk individuals in the insured population. The 0.80

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.		AIDS DEATHS @80%*1.05	LIFE TABLE RISK	LIFE TABLE RISK	SERVICE TABLE RISK	LAPSE RATES RISK	NON AIDS DEATHS IN SERVICE	LAPSE RATES RISK	NON AIDS DEATHS IN SERVICE	LAPSE RATES RISK	LAPSES RISK	AIDS		REMAINING		INSURED		SERVICE TABLE TOTALS	INSURED STAT PERCENT
			SOA AIDS RATES ^M	NON AIDS DEATHS											IN	INSURED	INSURED	AIDS STAT	INSURED	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	68	31	97,683	2,230	78,133	0.180	14,064	54	2,185	0.020	44	31	1,710	17.986	80,318	0.02129			
3	99,813	0.71	0.554	71	46	97,615	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	1.752	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	1.176	174	96	96,244	721	21,539	0.040	862	39	520	0.020	10	69	448	153.958	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	17,358	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	15,192	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	13,976	0.00654			
27	93,029	5.72	0.231	532	18	92,863	166	13,244	0.040	530	76	93	0.020	2	10	79	126.907	13,337	0.00596			
28	92,479	6.31	0.204	584	16	92,330	148	12,638	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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CHART 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	1989 Y.O.I.		NON AIDS DEATHS	AIDS DEATHS @80%*1.05	LIFE TABLE NOT @ RISK	LIFE TABLE NOT @ RISK	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	NON AIDS DEATHS IN SERVICE	SERVICE TABLE NOT @ RISK	LAPSE RATES NOT @ RISK	AIDS DEATHS IN SERVICE	REMAINING INSURED AIDS STAT	INSURED AIDS STAT	SERVICE TABLE TOTALS	INSURED AIDS PERCENT		
		BASIC MORTALITY RATES/M	SOA AIDS MORTALITY RATES/M																
32	89,743	9.28	0.147	833	11	89,650	93	10,410	0.040	416	97	46	0.020	1	6	40	137,923	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	139,397	9,937	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	140,987	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	144,540	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	83,375	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	189,921	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	24,583	126.68	0.008	3,127	0	24,582	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

(Continued)

CHART 1

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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 RATESM	1988 Y.O.L.		NON AIDS DEATHS @50M*1.05	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 O/SAM	SERVICE TABLE TOTALS	INSURED @ RISK PERCENT	
			SOA AIDS MORTALITY RATESM	DEATHS																
63	15,800	162.59	0.006	2,589	0	15,799	1	766	0.020	15	125	0	0.020	0	0	0	291.556	767	0.00008	
64	13,231	175.87	0.005	2,327	0	13,230	1	628	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	1,900	0	8,836	0	399	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	178	0.020	4	44	0	0.020	0	0	0	379.456	178	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	2248	SUM OF LAPSES AND DEATHS						97761	2248							
TOTAL				100000																100000

734

(Continued)

CHART 1

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AIDS -- AN ACTUARY'S RESPONSIBILITIES

comes from the SOA Report for issue years after 1983, but you should take into account any other information you have. Both of these adjustments are direct multiples in the formula for column F.

With this input, you can run the worksheet for each of your cells. Here's what the worksheet does. It splits the 100,000 lives into two groups – those who will die from AIDS, the at-risk group, and those who will die from all other causes. Next it creates service tables for each of these groups separately. This is necessary to allow use of different lapse rates for the at-risk group. Finally, it projects annual lapses and deaths for each group.

Now here's how to use the results. Projected claims come from column P. For the example, if you issued \$100 million in that age cell, you would expect \$19,000 of AIDS claims in the first year, \$31,000 in the second year, and so on. The starting value of column B should be the in-force or new business for each cell.

What about other ages, females and tested business, and actual experience? The SOA Task Force provided a lot of guidance in these areas. Population AIDS excess mortality rates by age and sex were included in their report. Also a method of deriving AIDS qx's for tested business was provided. To give you an idea of the effect of testing, column D would change to these rates for an otherwise identical cell. For the first policy year, instead of 0.230 per thousand, it will be 0. For policy year five, instead of 0.986, it will be 0.061. For policy year 10, 1.766 becomes 0.447, and in policy year 20, 0.663 becomes 0.479.

In addition, the recommended adjustment from population mortality to insured mortality drops to 0.60 in the absence of other information.

The final variable to factor in is your own AIDS claim experience. After projecting AIDS claims using recommended adjustments, you can compare your actual experience for the years you have it with the projected. That ratio could be used to adjust column F or column P (the results would be similar adjusting either) for all durations. You might have to use a composite adjustment for all cells since the amount of experience is likely to be limited.

This brings me to my last point on claim projection. It is desirable to monitor AIDS claims by duration, age, sex, and tested versus untested. Plan type might be a factor as well.

Once you've completed your AIDS claim projections and analysis, reflecting that in your reserves and pricing is relatively straightforward. Before we get into that, however, my presentation tips brochure suggests sighting a few significant statistics to maintain or perhaps gain your attention. Here's what I found.

AIDS accounted for more than \$220,000 million in ordinary life claims in 1989 or approximately 2% of the industry total. That's up from \$90 million or 0.95 in 1986. The Centers for Disease Control (CDC) reported a total of 168,000 AIDS cases through February of 1991. Approximately 10% of those were female. Of the total, 106,000 have died. Nearly 75% of AIDS victims are between 25 and 44. Homosexual or bisexual men and intravenous (IV) drug users of both sexes account for

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more than 86% of AIDS deaths to date. And in New York City, AIDS is the leading cause of death among males 25-44. Hopefully, if you haven't done so already, that will make you think some more about setting up AIDS reserves.

As I mentioned earlier, I have covered reserve factor development at last year's Hartford meeting, so I'll be very brief here. By isolating the insured at-risk deaths (column P and column Q), you can develop a life table. Chart 2 can be viewed as an appropriate life table for insuring known at-risk individuals only. Obviously the qx's are extremely high. From here it is a standard Commissioners Reserve Valuation Method (CRVM) reserve calculation with one more exception. The funding period should be limited due to the claim curve peaking so early. This is necessary to eliminate postfunding and negative reserves at some durations. In this case, 15 pay life was assumed. The standard reserve is then subtracted to arrive at the excess AIDS reserve. However, since the at-risk group represents a small fraction of the total in-force, the additional reserves applicable to the total in-force are the excess factors multiplied by the percentage of at-risk policyholders assumed in the in-force. Note that these percentages can be reviewed and adjusted over time as experience grows.

You can see the effect of the assumed lapse-rate antiselection by looking at the insured at-risk percent column. It grows for the first eight years until the high mortality starts to reduce the at-risk group while lapses in the non-at-risk group settle down.

One last note on reserving. The Actuarial Standards Board had drafted a proposed standard for reserving for AIDS. However, it has since decided that a standard is unnecessary. This is not because it is unnecessary to recognize AIDS, but rather because the Financial Reporting Recommendations, specifically Recommendation 7, already require it. An additional interpretation, 7D, was published last year to amplify and clarify this requirement. I think Ken will have a little more to say about that. It does not say you must hold reserves for AIDS, but you must consider the need and hold reserves if necessary.

Okay, now let's go back to the Chart 1 and move on to pricing. Are there any questions?

MR. ALAN W. FINKELSTEIN: Your 15 pay life AIDS reserve -- is this a CRVM?

MR. HANRAHAN: Yes, it is.

MR. FINKELSTEIN: Okay. And the interest rate of 8.16%, how is that determined?

MR. HANRAHAN: For 1989, that is the applicable federal rate. As in reserves, once you have made your assumptions and done the claim projection, you're pretty close to being done. Some of the conservatism appropriate for reserves may be reduced when you're pricing, but the same factors need to be considered. You may find yourself, as we did, in the position that most of your in-force has not been tested for AIDS but most of your new business was or will be. One approach is to assume that the ratio of actual experience to projected for untested business will apply to tested business as well. Then you start with the population-tested rates from the

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

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

age	ix	dx	AIDS		- Dx	- Nx	- Cx	- Mx	15 PL	STD CRVM	INSURED	MEAN	AVERAGE
			Qx'S/M	Dx					INSURED	RESERVE			
									80 CSO	MALE 25, 8.16%	PERCENT	PERCENT	EXCESS
									MEAN RESERVE				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	17.986	1581.0	1507.1	10580.8	27.348	751.011	66.01	3.64	0.02129	0.02334	1.46
27	1,679	45	26.553	1435.4	1362.5	9073.7	36.658	723.663	124.64	6.69	0.02539	0.02736	3.23
28	1,635	60	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	879.3	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	369.89	25.99	0.03717	0.03705	12.74
33	1,190	120	100.775	635.6	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	46.89	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	176.6	157.0	737.1	26.034	118.776	674.44	65.62	0.02293	0.02163	13.17
40	448	69	153.958	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	56.580	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	226.0	7.595	34.741	660.48	103.68	0.01265	0.01195	6.65
45	198	30	150.164	41.2	36.7	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	0.00946	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	0.00546	0.00524	2.43
53	61	8	124.854	6.8	6.1	30.0	0.811	4.406	654.93	198.35	0.00501	0.00481	2.19

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

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

age	ix	dx	AIDS		- Dx	- Nx	- Cx	- Mx	AIDS	STD CRVM	INSURED @RISK	MEAN PERCENT	AVERAGE MEAN EXCESS RESERVE
			Qx'S/M	Dx					INSURED MEAN RESERVE	80 CSO MALE 25, 8.16%			
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	8	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	0.468	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	140.967	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	155.961	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	219.856	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)

CHART 2

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CHART 2

(Continued)

SAMPLE CALCULATION INSURED AIDS MORTALITY TABLE FOR 1989 ISSUES: 8:16%													
$i = 0.0816$ $d = 0.0754437$ $\text{delta} = 0.0784414$ $v = 0.9245562$													
age	lx	dx	AIDS Cx'SM	Dx	- Dx	- Nx	- Cx	- Mx	AIDS INSURED MEAN RESERVE	STD CRVM RESERVE 80 CSO MALE 25, 8.16%	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	698.70	0.00014	0.00013	0.01
84	0	0	260.542	0.0	0.0	0.0	0.000	0.001	809.18	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	280.648	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	379.458	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

OPEN FORUM

Society's report, and put that in column D. Then use your actual-to-expected ratio for untested business times 60%, which is the recommended adjustment to go back to insured mortality, in place of the 80%, in column F.

Once you've settled in on your pricing assumptions, input them in column C, D, J, and N, and the formula in column F. Total mortality rates, including AIDS, are equal to column L plus column P divided by column S. You now have theoretical pricing mortality. After a quick check of the competition, the theory may change but hopefully not too much.

If you'll bear with me a little longer, I have a few caveats. The worksheet has a lot of simplifications, especially rates versus probabilities. Considering the uncertainty regarding the course of the epidemic, this seems appropriate. It's more important that you monitor your own claims experience and keep abreast of how this epidemic is proceeding. When you're reviewing your claims, be sure to consider your treatment of term and/or group conversions as far as durational analysis. Also, since not all AIDS claims are identified as such, keep an eye on your total claims by sex and age.

Based on our claims, the expected increase in the insured at-risk group after 1983 may have been overestimated. The task force recommended switching from 40-80% for issues after 1983, but our experience has been more level.

Finally, although I think all of us need to keep a sense of humor about ourselves and our work, I do not think that there's anything funny about AIDS itself -- it is deadly serious.

MR. LEROY PRUITT: Exactly how did you define an AIDS death?

MR. HANRAHAN: Primarily in those areas that do code for AIDS, as opposed to New York City, as the cause of death, we recognize those and some adjustment for most likely AIDS deaths, when recognized by the underwriting area.

MR. PRUITT: Okay, what about AIDS-infected persons with deaths from other problems?

MR. HANRAHAN: We won't recognize that.

MR. PRUITT: No suicides either?

MR. HANRAHAN: There's underreporting in general. The CDC estimates 10-20% underreporting, and there's also the fact that people may decide to end it a little sooner. But, no we don't have any facility for catching those.

MR. KENNETH A. LASORELLA: I'd like to first address the Gorski memo, being from Illinois. Larry Gorski, who's with the Illinois Insurance Department, has written a letter. In Illinois we are very much aware of his position on AIDS. Most of you are familiar with his letter, since most companies here probably do operate in Illinois. But it's worth discussing what he considers our responsibilities to be as actuaries.

AIDS -- AN ACTUARY'S RESPONSIBILITIES

The first step is choosing whether you should be setting up an AIDS reserve. How do you actually look at this? What he's suggesting is that the reserves, not the reserves plus appropriated surplus, or allocated surplus, have to make good and sufficient provision for all the unmatured obligations. So that is the first issue -- reserves. The focus is really on reserves. He underlines reserve in his memo.

The second part, maybe that is key here, is how do you test reserves? And Larry is really saying, let's not worry about whether actuarial standards come out on AIDS specifically. We still have the responsibility as actuaries when we sign the actuarial opinion to make sure that the reserves are adequate and sufficient. So that implies, from the standards we have, a gross premium valuation.

Now, one easy way to do that, I shouldn't say easy, but one way to actually check this out is to forecast your future AIDS claims, and basically present value those additional AIDS claims just the way John was talking about modeling these out. And you could present value those at some asset earnings rate similar to John's 8.16%. And now you'll have a decent estimate of the present value of the future extra AIDS claims. Now to find out if you legally really have to set up additional reserves, you could simply take a look at your gross premium profit margin. For example, let's suppose you knew, based on pricing and experience, that 5% of gross premiums was a profit margin on traditional business. As long as you could present value the 5% gross premiums, as profit margins, and that present value exceeded, at an asset earnings rate, the extra AIDS mortality risk, you would not have to hold an additional AIDS reserve, legally.

You still may wish to hold an AIDS reserve just to preserve the same relative degree of conservatism. So I am not suggesting that just because legally you don't have to, that you shouldn't.

The other issue here in the Gorski letter is whether you're qualified. I would stick to the actuarial standards and opinions and just make sure that you have some knowledge and data so you'll be able to actually assess the AIDS risk properly. Most companies, by the way, have probably not done that. I would venture to say most actuaries have probably signed the opinion, taken a look at what the past AIDS claims were, and as long as they weren't significant at this point, probably did not attempt to quantify this or hold an extra AIDS reserve. I think very few companies are actually holding AIDS reserves or have a decent quantification at this point, although more and more are trying to model the risk.

Almost all the models we're talking about start with some assumption as far as how many at-risk individuals will eventually become infected and we're currently dealing with about four million. The Society of Actuaries Committee on HIV research has a type of S curve that you'll find in the Cowell and Hoskins report. The only difference is they do vary one parameter. This is called the negative exponential or S curve. They just vary a parameter so that you can fit the data a little better. So they end up freezing future new infections, making it constant rather than having it die out. But the assumption is still that it's based on four million people ultimately. So that's something that should be borne in mind, that we're not talking about projecting claims into the heterosexual community at all. When we make the assumption of four million, it really comes from about roughly 800,000 IV drug abusers, 100% of

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the sexually active homosexual population (assumed to be about 3% of the sexually active male population), and 20% of the other at-risk group, the bisexuals (also assumed to be 3% of the sexually active male population). And that adds up to about four million.

I'd like to then just move on to address one assumption, the assumption of moving from general population AIDS mortality, to insured population AIDS mortality. In the SOA report it's recommended that 40% be used for pre-1984 untested business and then 80% be used for post-1983. Pre-1984, there really wasn't much antiselection. Very few people had even heard of AIDS. By 1984, there was a lot of publicity and more companies were exposed to antiselection. For tested business, 60% is what is recommended.

Now it's important to know roughly where this 80% comes from. And actually what it comes from roughly is an attempt to remove the IV drug abusers. In other words, it's probably a fairly valid assumption that IV drug abusers would not be applying for insurance or at least would not be accepted. And roughly 20% of the reported AIDS cases were IV drug abusers at the time. For a company writing debit business or monthly debit ordinary-type business, it's probably not true. Probably a lot of the claims do come from IV drug abusers. And so it depends on the market.

It's worthwhile looking to see what those percentages are (see Table 1). For males, 63% of the cases over the last year came from male homosexual or bisexual contact. But another 6% came from people who might be a combination. They might be a homosexual or bisexual, but they're also IV drug abusers. And then an additional 20% comes from the group that would be exclusively IV drug abusers. So just looking at the 6% and the 20% already we have 26% from the IV drug-abusing male population.

TABLE 1
AIDS Cases
February 2, 1990 to January 1991

Category	Male	Female
Male/Homosexual/Bisexual	63%	
Male Homosexual/Bisexual and IV Drug Abuse	6	
IV Drug Abuse	20	48%
Heterosexual Contact	3	34
Other	8	18

And I might add that still close to 90% of the cases are currently male as opposed to female. For females 48% comes from a drug-abusing population. Roughly half. And you can see the heterosexual community really has only a very small percent. Three percent for male. We have to bear in mind that with only 10% of the cases being female, we're talking about 34% of a very small number, and a lot of that has to do with prostitution.

So you can see, by using 80%, it's a very conservative assumption if your intent is really to remove IV drug abusers. Now besides removing IV drug abusers, you

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probably also want to consider, let's call it a lack of insurable interest, in the at-risk group. So you probably still want to use something smaller.

The reason why I'm going into that is because I have one forecast here. You don't have to worry about reading the numbers. I'll just tell you what the bottom line is. This is essentially a model that's similar to what John would be doing here with different age groups and forecasting out additional AIDS claims. We're talking about roughly 300 million for this particular company and that's using the assumptions that we took a look at, the SOA assumptions.

What I'm finding is that a lot of our clients are experiencing a lower mortality and that's mainly because of the assumption there of IV drug abuse. In addition to that, I think it comes from the fact that we operate in suburban areas. Many companies operate in suburban areas or in regions that have more favorable mortality than, say, the inner cities at least. So they might be part of the Standard Metropolitan Statistical Area (SMSA), but nevertheless be at the outskirts. Or we might deal with up-scale markets so the mortality or the AIDS risk there is a lot lower.

The last thing I'd like to bring up has to do with variability. Does anybody remember the formula for a standard deviation? Oh, sorry that was almost humor. Let's look at Table 2. When we're referring to claims, they are just the cumulative AIDS claims. This was done at the end of 1989. So if we went for a five-year period up to 1993 we have 2.8 million for this particular company. But 1998, five years later, a 10-year forecast would give us \$9 million; \$2.8-9 million mainly because of 1994, 1995, and 1996, three big years. Going out 20 years to the year 2008, it comes out to \$16 million. So the first issue is how far out do you go? As an actuary do you feel comfortable using a 20-year forecast (or 25-year forecast) and telling management to increase reserves by X dollars, when there's so much uncertainty? There may be a cure around the corner; zidovudine (AZT) or other drugs like AZT might prolong life substantially. Just yesterday I got an update on that watching "L.A. Law," but I won't get into the statistics. There are always new developments taking place so the question is, Can we just take only the data that we know now, ignore future changes in behavior or lifestyles, and go out with a 20-year forecast, a nice conservative forecast, and then set up extra reserves?

Note that on a present-value basis, some of it goes away. This is at a discount rate of 9%, so it's the extra AIDS claims at 9%. Now we're talking about \$2 million going up to \$7 million, depending on a five-year or 20-year forecast.

TABLE 2
Projected AIDS Claims
(in \$ millions)

Through Year	Cumulative AIDS Claims	Present Value @9%
1993	2.8	2.1
1998	9.0	5.2
2008	16.2	7.2

Referring to Table 3, there's a section called the cumulative after-tax statutory book losses. If we go back to the Anderson method, a book profit would be your

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statutory earnings minus the after-tax investment income on your surplus because you want to find out what the book of business actually earns. A way to test or find out how much this AIDS risk is really worth is to run out a statutory model without any AIDS assumption, just with normal mortality, and then compute the statutory after-tax, after-dividends, if you're a mutual company, book profit. Since you're ignoring investment income at an after-tax rate on surplus, it's a pure book profit. Present value that book profit at an after-tax rate of interest and that will give you an approximate idea of what the business is worth. It's like valuing a block of business. Now go back and use John's method for adding extra mortality for AIDS, for example, and rerun the model. You would have a value of the business worth substantially less than under the first run without the extra AIDS claims. The difference in the two present values of book profits would essentially be an extra AIDS reserve. But this is an AIDS reserve that takes Federal Income Tax into account because you're going to get some relief there. It also takes your dividend formula into account. It even takes a look at future losses as far as profit since when someone dies prematurely because of an AIDS claim, that means that you're no longer going to have the future book profits that you would have had. So it takes everything into account. You run the model with and you run it without and you compare the results. So that's another approach. It's much less conservative of course. But now we're talking about numbers between 700,000 and 3 million.

TABLE 3
Projected AIDS Claims
(in \$ millions)

Through Year	Cumulative After-Tax Statutory Book Losses	Present Value @6%
1993	0.9	0.7
1998	2.8	1.9
2008	5.2	3.0

To sum it up, depending on which method you use, the least conservative method could give you a number of 700,000 and the most conservative method here could give you 16 million using the same data and roughly the same assumptions. And that's all I have as far as the actual presentation.

MR. WARREN M. COHEN: Just a general question to the panel. To what extent in doing our projections do we feel comfortable taking into account nonguaranteed elements in products at least for many of our products the costs of insurance (COIs), dividends, riders, and other nonguaranteed elements to change them and use those for margins in our projection.

MR. LASORELLA: One problem with the COI charges has to do with the interest rate problem that we had about probably seven years ago or so when interest rates were moving up rapidly and all companies knew that they should basically change the credited rates, we'll say. And I remember a period in universal life when I would say the treasuries went down 3% in value, in yield, and yet the credited rates only went down 50 basis points. Most companies were reluctant to lower the rates simply because the competitors weren't lowering the rates. So the question here is that if you recognize that you could, you have a legal, say right, to raise the COI charges,

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are you really going to raise the COI charges if other companies aren't raising theirs sufficiently? How are you going to respond to the marketing pressures? So I think you have to build this into your model, along with adjusted lapse rates. If you could do that accurately, that's certainly a legitimate way of projecting claims.

MR. BEHAN: Just to layer another thought on that, that consideration that Ken just went through makes sense if your underwriting and your antiselection are comparable to the rest of the industry. Of course, if your underwriting is not as strong or you have more antiselection than the rest of the industry, then your costs are going to be out of line. And you might find that even if the industry moved you still wouldn't be able to recover keeping with the competition.

MR. THOMAS P. EDWALDS: Ken, when you are showing those ratios of the insured population mortality, AIDS mortality, to the general population, the post-1984 numbers seem pretty solid based on the data you had. But it seemed to me that pre-1984 ratio of 40% was kind of optimistic. And just because when people bought the insurance nobody knew about AIDS doesn't mean that they couldn't have caught it later. So why is that 40% justified?

MR. LASORELLA: Yes, actually I've been finding that the 40% is actually slightly conservative. Okay, for the companies that I've been doing some consulting with, I've been using probably closer to 30, and yet they've been coming out better than the 30% in general. A few companies haven't. But one particular company wrote a lot of disability business on dentists and the medical profession did have some bad experience. But again, this is before dentists started wearing surgical gloves and all that. So I think there might be a change even there and that was only slightly higher than the forecast. So what I've been trying to advise companies to do is to not worry so much about the accuracy of the numbers as much as the pattern. Once the pattern is established, then you could hook onto this pattern at some reasonable percentage, say perhaps 60% of forecasted. So much of the actuarial research that we've done here really helps to establish a pattern. And then it's up to the company to really analyze their own data.

I might also add that it's very difficult to know exactly how many AIDS claims a company is experiencing. Some gentleman just mentioned suicide before as one cause of death that would be very difficult to trace to AIDS. Some types of cancer and pneumonia you could assume would be an AIDS claim, but even there it's a guess.

MR. HANRAHAN: I'm not sure if it was totally clear, but the 40% is for issues of 1983 and prior. And I think, part of the idea behind the 40% and 80% was trying to get a guess at what the high-risk group representation would be in insured groups. And part of the reason it jumps so much is that with the awareness of AIDS, there was a feeling that there would be antiselection against insurers to try to buy insurance that would be a bargain if you're in that high-risk group. That didn't exist, in the preawareness period.

MR. GORDON H. LEAVITT: I'm with Savings Bank Life Insurance of New York. We're heavily concentrated in the metropolitan area so we have a lot of experience. You expect that might result in a lot of intelligence, but I'm not quite sure. As

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somebody has mentioned, in New York many, many claims are coded as natural causes, claims that you find out later on are AIDS claims, but the city hospitals are encouraged to code them as natural causes. So I started out trying to do a study based on coded causes of death and I found that it was hopeless. So I did another study on deaths at young male ages, say ages up to 39, and I found that the trend of that was up in the middle 1980s but since then has fallen off, which leads me to suspect that the trend, at least in the New York area, is going down. I should say I did the study on claims excluding suicides, homicides, and accidents, that is, all unnatural causes. And that seems to show a decrease or perhaps leveling off in the last few years.

MR. LASORELLA: Could you comment on your testing limits though?

MR. LEAVITT: Essentially unchanged. We sell mostly small policies and we haven't tested small policies. Another thing I might mention is that the gay life-style certainly has changed in the last five years. And it's unreasonable to suspect that it would stay the same for 20 years given the AIDS epidemic. And I would be very reluctant to do a model office study that shows the same trends for going out 20 years.

MR. HANRAHAN: I wanted to comment on your earlier point that we have noticed there was a bit of slowing in 1989, and some of that may be attributable to physicians recognizing the disease and prescribing drugs that are delaying death. So I think with a longer period, you may find you're more comfortable with your numbers or that instead claims are just delayed a little bit, not gone away.

MR. LEAVITT: An important thing now, of course, is the saliva test coming on which we intend to adopt as soon as we can because that means you can examine many more people than you can with the blood test. And it is not nearly as negative an element in selling insurance.

You said that the ratio of female claims is about the same as before? I've assumed that the rate on male claims will be a good indication of the overall rate. Is that a fair assumption?

MR. LASORELLA: Yes, it's approximately the same. However, there are more female claims now than say four years ago. I think originally the female claims were approximately 5-6% of the total claims, whereas now we're talking about roughly 11%, between 11% and 12% I think. So there has been a slight trend, but it's been very slow and gradual over about an eight-year period.

MR. LEAVITT: I would second the idea that IV drug users are not insurance buyers, they're people that don't think about tomorrow. So that would cut out a big portion of the population claims.

MR. CONWILL: I'd like to make one comment on your very first point, which is a real good one, that even if you're having trouble getting a handle on the actual AIDS claims, that actual to expected analysis of overall mortality is extremely useful.

MS. TIA GOSS MCINTOSH: I have a technical question. When you sight the male/female ratios, does that include children?

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MR. LASORELLA: The children population is very small as far as AIDS goes, but normally I would say we're not trying to get that refined. So when we talk about 11%, it's kind of a rough number. So it could be 11.7 or it could be 10.2, something like that. But it's around 11.

MS. MCINTOSH: Maybe a better question, then, is what percentage of the total claims are children? I ask that only because you would expect 50% of the children to be female.

MR. HANRAHAN: Right off the bat, I know that there are claims. We group them by age group and zero to 19 is very, very small. There was a publication that estimated that about 80,000 women of child-bearing age were infected and that they had delivered around 2,000 children who would become infected with AIDS. It's not automatic that the children will be born with AIDS. I think it's about a third of the children born to infected mothers will permanently have the HIV virus. So it gives you a rough idea of what kind of numbers we're talking about. How soon they die after birth and so on, I'm not that certain.

MR. CONWILL: I have some numbers here from the CDC through March 1991 and at that time, about 170,000 AIDS cases had been diagnosed and of them, only about 3,000 were children younger than age 13.

MR. LASORELLA: Yes, that's what I have here.

MR. EDWALDS: The comment that was made about doing the actual to expected mortality study I think is a real good one. It seems to me that because of the difficulty of identifying what the actual cause of death is, from the perspective of insurers, it doesn't really matter. You know we're going to pay the claim for that regardless of the cause. So what we really want to know is what our expected claims experience is going to be. But from the perspective of individual companies, it will take us too long to have enough credible experience to be able to say. Is anyone aware if the SOA has sponsored industrywide data gatherings so that this trend could be better monitored?

MR. HANRAHAN: The ACLI and HIAA have been conducting a joint survey of AIDS-related claims. They have data from 1986 up to 1989. It's broken down by individual life, group life, individual health, and group/accident health.

There's a bit of lag on gathering data. They're looking at AIDS claim mortality and at what percent they are of the total claims. As far as looking at the trend and what the total claims have been, then you start introducing the exposure changes, you know, the amount of exposure increase and so on. Obviously the Society does do intercompany studies on claim costs. But there's a bit of a lag.

MR. BEHAN: Steve Conwill who's on the panel had a number of pretty thought-provoking questions. So I've asked him to just pick out his best and give you one more question from our side.

MR. CONWILL: Someone had mentioned nonguaranteed elements earlier. And I think the whole issue of either guaranteed or nonguaranteed elements and

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nonparticipating products or participating products is very interesting. The question I had is concerning dividend practices. As we go about revising our experience mortality over the next decade or longer, we are likely to see a bulge in the mortality of males in say the age 30-50 range. The question that comes up is, does the knowledge that this bulge is coming from AIDS claims affect our course of action in any way? Should we simply allocate AIDS claims to those ages for which the claims arise or can we change our notion of dividend class in response to the epidemic? In particular, whether or not it's AIDS that we're talking about, can we spread AIDS claims more broadly in the dividend calculation than we might otherwise have done?

MR. LEAVITT: I thought about that question. But right now I don't really know what percentage of your claims are really AIDS claims and you can't really isolate it. I've had a little bit of correspondence with the Society Mortality Committee. I wanted some statistics about claims of the young male ages, the most recent experience. It gets published at such a late date compared with the actual experience that it's hard to get very recent data. They said they are doing a study on AIDS claims but I believe they're using the coded cause of death, which means I don't believe the results will be extremely valuable. Does anyone here on the Mortality Committee have any comments about that? Or is there any chance of getting a more recent study at young male ages? Is there anybody here who's on the committee or has recently been on the committee?

MR. HANRAHAN: I've got a couple of comments. I'm involved in a Society Task Force studying valuation mortality and we are trying to gather more current data. Jack Luff hasn't jumped to the podium just yet. He works at the Society and has been involved in at least the distribution and the assembly of the intercompany mortality studies.

The most recent experience we have gets up into the 1987 policy year. He'll be releasing 1988 and I think 1989 fairly soon. That does show that the male 25-44 age group has not shown the mortality improvement that the rest of the age groups have shown.