

**1991 VALUATION ACTUARY  
SYMPOSIUM PROCEEDINGS**

**SESSION 4**

**Long-Term-Care Valuations**

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## **LONG-TERM-CARE VALUATIONS**

**MR. EDWARD MOHORIC:** For my portion, I am going to talk about three different areas with regard to long-term care (LTC). First I am going to briefly recount the minimum standards as set forth by the NAIC model and some of the issues that go along with the standards. Second, I am going to review the standards for the valuation actuary and talk about how they may apply to LTC. Third, I will move into cash-flow testing and how it applies to LTC.

### **Minimum Standards**

For considering statutory reserves, the NAIC passed the new Minimum Reserve Standards for Individual and Group Health Insurance Contracts in 1988. As it says in the title, it applies to all individual group policies and defines the standards for claim, premium, and contract reserves. It generally sets the minimum reserves equal to claim reserve plus the greater of (a) the gross unearned premium or (b) the net unearned premium plus the contract reserve.

This regulation tries to be reasonably consistent with the Standard Valuation Law, at least in the law's former form. The maximum interest rate allowed in health contracts is the whole life maximum, which is a number that is defined to move according to changes in Moody's Corporate Bond Index. This is currently 5.5% and has been 5.5% since 1986.

Mortality standards are defined, "as the mortality basis used shall be according to a table but without use of selection factors permitted by law for the valuation of whole life insurance issued on the same date as the health insurance contract." Currently, this means the 1980 CSO table. As we will get into later, there is some rationale as to why 1980 CSO may be inappropriate for long-term care.

One other interesting feature on the Minimum Reserve Regulation is the use of termination rates. For noncancellable disability, no termination rates are allowed. However, in developing this regulation, it was recognized that use of mortality only was often extremely conservative for health insurance reserves and that some element of lapsation should be

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considered. As such, for policies that are not noncancellable, a termination rate may be used not to exceed 8% and defined as the lesser of (a) 8% or (b) 80% of the termination rate assumed in the product (or the actual mortality rate, if greater).

As far as morbidity standards, standard tables are defined for several types of products, but with respect to LTC there is no standard table yet. Typical practice tends to be use of claim costs, possibly with a margin.

One recent change in this model regulation for LTC is a change from the standard health insurance practice of two-year, preliminary-term reserves to a one-year, preliminary-term reserve. We will look at some analysis later as the flow of profits can get extremely strange using a two-year preliminary term.

In having said all of this, individual states have not moved quickly to develop the new NAIC model. In fact, to my knowledge, only Wisconsin had adopted the new model regulation. Of course, only 11 states have adopted the old model which allows 1958 CSO mortality, two-year preliminary reserves, and 3.5% interest. Other states generally tend to not have much in the way of standards with the possible exception of specific standards for noncancellable disability-income reserves. As an example, in Pennsylvania the only regulation says that you must hold at least the gross unearned premium reserve (UPR).

I have prepared a sample development of LTC reserves under a number of assumptions. In Table 1, I show reserves using the assumptions in the NAIC model regulation. All told, at least in this example, the numbers work out fairly well, but I will caution you that in the development of assumptions for this example I used the 1980 CSO as the pricing mortality.

Table 2 shows development with a two-year, preliminary-term reserve. The key point I will make here is that the profits are fronted tremendously into the second and third calendar year after which the profits are fairly minimal, as the reserve increase is dramatic. It is not

**TABLE 1**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9339	0.00	0.00	0.00	-80.81	1
2	0.6636	81.59	54.15	54.15	91.36	2
3	0.5083	246.02	125.04	70.89	29.17	3
4	0.4065	413.11	167.94	42.90	25.16	4
5	0.3338	581.64	194.12	26.19	22.79	5
6	0.2783	749.88	208.67	14.54	22.29	6
7	0.2354	912.55	214.82	6.16	19.43	7
8	0.2012	1064.64	214.18	-0.64	15.59	8
9	0.1705	1206.33	205.62	-8.56	15.23	9
10	0.1430	1338.25	191.42	-14.20	14.37	10
11	0.1187	1461.72	173.55	-17.87	13.15	11
12	0.0973	1573.11	153.14	-20.41	11.76	12
13	0.0787	1668.05	131.34	-21.80	10.17	13
14	0.0628	1746.23	109.60	-21.75	8.56	14
15	0.0493	1806.18	88.97	-20.62	7.01	15
16	0.0380	1844.94	70.19	-18.78	5.57	16
17	0.0289	1862.88	53.84	-16.36	4.29	17
18	0.0216	1859.55	40.12	-13.72	3.23	18
19	0.0158	1828.32	28.91	-11.20	2.35	19
20	0.0114	1759.23	20.00	-8.91	1.64	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1980 CSO Male Age Last Birthday  
Reserves: 5.5% Interest  
1980 CSO Male Age Last Birthday  
NAIC Lapse

**TABLE 2**

**Sample Reserve Calculation  
Two-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9339	0.00	0.00	0.00	-80.81	1
2	0.6636	0.00	0.00	0.00	143.59	2
3	0.5083	84.94	43.17	43.17	51.99	3
4	0.4065	256.57	104.30	61.13	1.66	4
5	0.3338	430.28	143.61	39.31	5.53	5
6	0.2783	604.45	168.20	24.59	8.94	6
7	0.2354	773.38	182.06	13.86	9.07	7
8	0.2012	931.62	187.42	5.36	7.43	8
9	0.1705	1079.36	183.98	-3.44	8.36	9
10	0.1430	1217.21	174.11	-9.87	8.63	10
11	0.1187	1346.43	159.86	-14.24	8.41	11
12	0.0973	1463.35	142.46	-17.41	7.87	12
13	0.0787	1563.55	123.11	-19.34	7.02	13
14	0.0628	1646.73	103.35	-19.76	6.05	14
15	0.0493	1711.44	84.31	-19.05	5.03	15
16	0.0380	1754.78	66.76	-17.54	4.04	16
17	0.0289	1777.17	51.36	-15.40	3.12	17
18	0.0216	1778.26	38.37	-13.00	2.35	18
19	0.0158	1751.50	27.70	-10.67	1.70	19
20	0.0114	1687.06	19.18	-8.52	1.17	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
 Pricing Mortality: 1980 CSO Male Age Last Birthday  
 Reserves: 5.5% Interest  
 1980 CSO Male Age Last Birthday  
 NAIC Lapse

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unusual with two-year, preliminary-term reserves to actually show negative profits for several years, e.g., years four through 10 or 11.

For illustrative purposes only, Table 3 shows net level reserves. Naturally this increases the surplus strain, which is not something that is desirable for most companies but produces a pattern of profits that is maybe more typical of most life business.

In Table 4, I changed the pricing assumption to a 1979-81 population mortality, which is lower than the 1980 CSO Male mortality and may be closer to actual experience. In this case, you can see that the profits turn negative starting in year 17. This is because the reserves are assuming higher mortality than is actually happening and the reserve is proving to be somewhat inadequate by the late years.

Table 5 shows that this can be solved by using 1979-81 U.S. population and mortality in the reserves. This is more conservative and probably more appropriate, but does not appear to be allowed from a reading of the model regulation. There is also some sentiment for using an annuity table that would have even lower mortality than this and thus be more conservative. Again, the actual choice of mortality should be done with an eye towards a combination of conservatism, appropriateness and, where applicable, legality.

Table 6 shows the reserves assuming zero lapses, and the reserves in this case are higher in the early years, delaying profits. However, with LTC eventually the mortality becomes greater than the assumed lapse rate or 8%, and therefore, reserves become slightly lower.

Table 7 is the same as Table 1 except that it uses a lower interest rate and illustrates that in this case the interest-rate difference did not have a major bearing on the level of reserves. This may not be universally true.

Table 8 shows the impact of a 5% compounded cost of living adjustment built into the calculation and shows that the reserves become inadequate again after 17 years for the

**TABLE 3****Sample Reserve Calculation  
Net Level Reserves**

<u>Calendar Year</u>	<u>L<sub>x, t</sub></u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9339	78.99	73.76	73.76	-151.96	1
2	0.6636	237.82	157.83	84.06	67.84	2
3	0.5083	398.51	202.55	44.72	61.91	3
4	0.4065	561.32	228.19	25.64	47.41	4
5	0.3338	724.93	241.95	13.76	39.14	5
6	0.2783	887.57	246.98	5.03	34.92	6
7	0.2354	1044.32	245.84	-1.14	29.23	7
8	0.2012	1190.58	239.52	-6.33	23.31	8
9	0.1705	1326.53	226.11	-13.41	21.74	9
10	0.1430	1452.84	207.81	-18.30	19.80	10
11	0.1187	1570.87	186.51	-21.30	17.65	11
12	0.0973	1677.03	163.26	-23.25	15.43	12
13	0.0787	1766.99	139.13	-24.13	13.14	13
14	0.0628	1840.44	115.51	-23.62	10.93	14
15	0.0493	1895.88	93.39	-22.12	8.87	15
16	0.0380	1930.31	73.44	-19.95	7.02	16
17	0.0289	1944.02	56.18	-17.26	5.40	17
18	0.0216	1936.52	41.78	-14.40	4.06	18
19	0.0158	1901.05	30.06	-11.71	2.96	19
20	0.0114	1826.55	20.78	-9.29	2.08	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
 Pricing Mortality: 1980 CSO Male Age Last Birthday  
 Reserves: 5.5% Interest  
 1980 CSO Male Age Last Birthday  
 NAIC Lapse



**TABLE 4**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9406	0.00	0.00	0.00	-81.26	1
2	0.6792	81.50	55.36	55.36	91.87	2
3	0.5301	245.84	130.31	74.95	27.95	3
4	0.4333	412.94	178.93	48.62	22.72	4
5	0.3648	581.47	212.10	33.16	19.33	5
6	0.3128	749.72	234.49	22.39	18.08	6
7	0.2729	912.40	248.97	14.49	14.34	7
8	0.2411	1064.49	256.66	7.69	9.57	8
9	0.2118	1206.18	255.42	-1.25	9.04	9
10	0.1847	1338.11	247.16	-8.25	8.14	10
11	0.1599	1461.59	233.72	-13.44	6.91	11
12	0.1373	1572.99	216.01	-17.71	5.47	12
13	0.1169	1667.93	195.01	-20.99	3.85	13
14	0.0986	1746.12	172.22	-22.80	2.38	14
15	0.0823	1806.07	148.70	-23.51	1.19	15
16	0.0680	1844.85	125.39	-23.32	0.28	16
17	0.0555	1862.79	103.33	-22.06	-0.46	17
18	0.0447	1859.47	83.20	-20.12	-0.96	18
19	0.0356	1828.23	65.17	-18.04	-1.24	19
20	0.0280	1759.15	49.24	-15.93	-1.30	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1979-81 U.S. Population Mortality  
Reserves: 5.5% Interest  
1980 CSO Male Age Last Birthday  
NAIC Lapse

**TABLE 5**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9406	0.00	0.00	0.00	-81.26	1
2	0.6792	99.37	67.49	67.49	80.17	2
3	0.5301	302.08	160.12	92.63	11.78	3
4	0.4333	513.21	222.38	62.26	11.72	4
5	0.3648	732.23	267.09	44.71	11.34	5
6	0.3128	958.19	299.69	32.60	12.21	6
7	0.2729	1182.67	322.73	23.04	10.82	7
8	0.2411	1395.64	336.51	13.78	9.03	8
9	0.2118	1593.72	337.48	0.97	12.68	9
10	0.1847	1772.99	327.49	-9.99	15.75	10
11	0.1599	1932.21	308.98	-18.51	17.61	11
12	0.1373	2071.26	284.43	-24.55	17.50	12
13	0.1169	2188.48	255.88	-28.55	16.10	13
14	0.0986	2282.89	225.16	-30.72	14.42	14
15	0.0823	2353.93	193.81	-31.35	12.58	15
16	0.0680	2399.45	163.08	-30.73	10.69	16
17	0.0555	2419.38	134.20	-28.88	8.85	17
18	0.0447	2412.95	107.97	-26.23	7.16	18
19	0.0356	2375.38	84.67	-23.30	5.63	19
20	0.0280	2301.57	64.42	-20.25	4.27	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1979-81 U.S. Population Mortality  
Reserves: 5.5% Interest  
1979-81 U.S. Population Mortality  
NAIC Lapse

**TABLE 6**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9406	0.00	0.00	0.00	-81.26	1
2	0.6792	102.69	69.75	69.75	77.99	2
3	0.5301	308.36	163.45	93.70	10.92	3
4	0.4333	515.36	223.31	59.86	14.27	4
5	0.3648	723.91	264.05	40.74	15.24	5
6	0.3128	934.15	292.17	28.12	16.31	6
7	0.2729	1139.47	310.94	18.77	14.39	7
8	0.2411	1332.63	321.31	10.37	11.47	8
9	0.2118	1513.88	320.57	-0.74	13.23	9
10	0.1847	1683.70	310.99	-9.58	14.13	10
11	0.1599	1842.63	294.65	-16.34	14.32	11
12	0.1373	1985.59	272.67	-21.99	13.99	12
13	0.1169	2106.63	246.31	-26.36	13.13	13
14	0.0986	2204.77	217.45	-28.86	11.93	14
15	0.0823	2279.40	187.68	-29.78	10.50	15
16	0.0680	2328.41	158.25	-29.42	8.99	16
17	0.0555	2351.76	130.45	-27.80	7.46	17
18	0.0447	2348.73	105.10	-25.35	6.05	18
19	0.0356	2314.59	82.51	-22.59	4.74	19
20	0.0280	2244.24	62.82	-19.69	3.57	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1979-81 U.S. Population Mortality  
Reserves: 5.5% Interest  
1979-81 U.S. Population Mortality  
No Lapse

**TABLE 7**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9406	0.00	0.00	0.00	-101.16	1
2	0.6792	157.75	107.15	107.15	137.55	2
3	0.5301	482.15	255.57	148.42	32.35	3
4	0.4333	824.16	357.12	101.55	33.13	4
5	0.3648	1181.46	430.95	73.83	31.61	5
6	0.3128	1550.97	485.09	54.14	31.10	6
7	0.2729	1926.88	525.81	40.72	25.09	7
8	0.2411	2303.92	555.50	29.70	16.63	8
9	0.2118	2681.50	567.82	12.32	16.75	9
10	0.1847	3059.84	565.18	-2.64	15.95	10
11	0.1599	3440.50	550.16	-15.01	14.26	11
12	0.1373	3816.80	524.13	-26.03	11.84	12
13	0.1169	4179.90	488.71	-35.42	8.79	13
14	0.0986	4526.44	446.43	-42.28	5.78	14
15	0.0823	4849.88	399.32	-47.12	3.23	15
16	0.0680	5139.17	349.29	-50.03	1.14	16
17	0.0555	5388.63	298.90	-50.39	-0.68	17
18	0.0447	5589.12	250.09	-48.80	-2.08	18
19	0.0356	5715.33	203.73	-46.36	-2.95	19
20	0.0280	5729.74	160.38	-43.35	-3.27	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1979-81 U.S. Population Mortality  
Pricing Morbidity: 5% Compounded COLA  
Reserves: 5.5% Interest  
1980 CSO Male Age Last Birthday  
NAIC Lapse

**TABLE 8**

**Sample Reserve Calculation  
One-Year, Preliminary-Term Reserves**

<u>Calendar Year</u>	<u>Lx, t</u>	<u>Active Life Reserves Per Policy Issued</u>	<u>Active Life Reserves Per Policy In force</u>	<u>Change in Active Life Reserve</u>	<u>Statutory Pretax Profit</u>	<u>Calendar Year</u>
1	0.9339	0.00	0.00	0.00	-80.81	1
2	0.6636	88.97	59.05	59.05	86.64	2
3	0.5083	267.42	135.92	76.88	23.76	3
4	0.4065	446.94	181.69	45.77	23.18	4
5	0.3338	626.04	208.94	27.25	22.76	5
6	0.2783	802.78	223.39	14.44	23.46	6
7	0.2354	971.95	228.81	5.42	21.20	7
8	0.2012	1128.79	227.09	-1.72	17.64	8
9	0.1705	1273.58	217.08	-10.00	17.55	9
10	0.1430	1407.08	201.26	-15.82	16.76	10
11	0.1187	1530.69	181.74	-19.52	15.46	11
12	0.0973	1640.88	159.74	-22.00	13.88	12
13	0.0787	1733.40	136.49	-23.25	12.04	13
14	0.0628	1808.07	113.48	-23.01	10.15	14
15	0.0493	1863.50	91.80	-21.68	8.31	15
16	0.0380	1896.82	72.17	-19.63	6.60	16
17	0.0289	1908.42	55.15	-17.01	5.07	17
18	0.0216	1897.90	40.95	-14.21	3.79	18
19	0.0158	1858.65	29.39	-11.55	2.74	19
20	0.0114	1780.89	20.25	-9.15	1.90	20

Pricing Lapses: 25%, 20%, 15%, 12%, 10%, 8%, 6%  
Pricing Mortality: 1980 CSO Male Age Last Birthday  
Reserves: 3.5% Interest  
1980 CSO Male Age Last Birthday  
NAIC Lapse

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same reason as before: The 1980 CSO mortality is inappropriate in this case. The purpose of this table is to show you the impact that the magic of compound inflation can have on the reserves. In this case, in year two, the reserve is 90% greater than for a non-inflated product. By year 20 the reserve is \$5,700 per policy issued and is 325% greater than the reserve for a level policy.

### **Application of Valuation Actuary Requirements**

The application of valuation actuary requirements (i.e., cash-flow testing) will affect every company with assets above a certain level. If you have above \$500 million of assets, valuation actuary work will need to be done every year. Above \$100 million of assets will require valuation actuary work only every third year, depending on whether or not your surplus is deemed sufficient. Under \$100 million of assets will not need valuation actuary work unless your surplus is deemed insufficient.

The valuation actuary opinion will apply to all health products as well as life products. It says that reserves must be considered in light of assets and that cash-flow testing must consider economic scenarios, must consider the use of the mandatory securities valuation reserve (MSVR), and must disclose any reliances. To many health actuaries this is uncharted territory and "boldly going where no health actuary has gone before."

What does cash-flow testing involve? It involves looking at the actual assets that are currently owned and allocated to your health or LTC block. It involves determining the actual interest that you earn from your assets and the timing of asset maturities and other plan rollovers. This can be done on either an exact or a modeled basis. It involves doing something a little bit different than just assuming 8% interest. It involves making assumptions for reinvestments at various scenarios. Cash-flow testing involves projecting experience under a number of economic scenarios. It also, if you do more than just LTC business, can and should involve aggregating several lines of business together. You may find that one line of business will act as a buffer to another so risks are offset, or you may find that your risk is multiplicative and all lines move in the same direction. The Actuarial

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Opinion and Memorandum Regulation recommends using as a minimum the seven interest scenarios stated in the New York Regulation 126 with interest rates increasing or decreasing in six of the scenarios.

### **Application of Cash-Flow Testing to LTC**

In life insurance, much of the interest-rate-scenario projections are done stochastically where random changes in interest rates are combined with appropriate movement to lapses and other factors to give a number of solutions. However, most of the life analysis is interest-rate driven. If the interest environment changes, credited rates of interest change, and as credited rates change, lapses will vary as people move their annuities or universal life to companies that have a more competitive rate. For LTC, I do not think stochastic testing is as important. This is partially because of the softness of the assumptions that would be used (at least with current knowledge) and partially because the interest rate, although important in terms of reserve adequacy, is for an independent variable LTC and is not generally related to lapses or other factors.

In considering any cash-flow testing, thought must be given to interconnecting relationships. Certainly life insurance interest rates and lapse rates interact. In LTC, one of the more important issues will be lapse and morbidity. With higher lapse rates, it is likely that the morbidity on the remaining lives will be worse. Ranges of variations should be tested. Interest should be tested to measure how much of a decrease in interest rates can be absorbed before an additional reserve is required for adequacy.

An additional complicating factor for health insurance in general is the use of rate increases combined with achieving minimum loss ratio targets. If, for instance, lapses are high and morbidity worsens, the company will want to take rate increases, but it is also possible that lifetime loss ratios will not achieve the minimum standards. Table 9 shows how higher lapse rates can create a lower aggregate loss ratio even if the loss ratio in each given year remains the same. In doing cash-flow projections and measuring the impact of premium increase, consideration should also be given to not only minimum loss ratio but also to

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additional lapse upon implementing rate increases, and potential delays in getting rate increases approved by the state regulatory authorities.

**TABLE 9**

**Sample Lapse/Minimum Loss Ratio Issues**

	<u>Expected</u>			<u>Actual</u>		
	<u>Premium</u>	<u>Claims</u>	<u>Loss Ratio</u>	<u>Premium</u>	<u>Claims</u>	<u>Loss Ratio</u>
1	100	20	20%	100	20	20%
2	80	30	38	70	27	38
3	60	40	67	50	34	67
4	50	50	100	40	40	100
5	<u>40</u>	<u>60</u>	<u>150</u>	<u>30</u>	<u>45</u>	<u>150</u>
	330	200	61%	290	166	57%

Table 10 measures the impact of interest if, in fact, different rates are earned. It illustrates how much of the revenue on LTC is from interest and how critical an item is to overall profitability.

**TABLE 10**

**Interest Impact  
20 Years**

Premium: \$1,643

	<u>Rate</u>	<u>Interest</u>	<u>% of Premium</u>	<u>% of Revenue</u>
1	5.5%	\$344	21%	17%
2	6.5	407	25	20
3	7.5	469	29	22
4	8.5	532	32	24
5	9.5	595	36	27

In doing valuation actuary work, you must also consider any relevant benefit features in the product. This can include inflation protection and the impact of nonforfeiture values. It also includes treatment of what up until now has been more of an ancillary benefit of home health care and adult day care, but which may broaden in the future. Waiver of premium is another item that should be considered. If a large percentage of the in-force block is on claim, the impact of a waiver-of-premium benefit lessens your ability to effectively take rate



## LONG-TERM-CARE VALUATIONS

increases. Another concern and issue is the potential for regulators to broaden benefit definitions beyond something that was anticipated in original pricing. For example, although new products do not have three-day hospital gatekeeping, a significant amount of many companies' in force does have this restriction. Yet regulators, in some instances, are trying to apply the new NAIC standards (which prohibit gatekeeping) to policies already in force. Clearly, this is both a rating issue and a reserving issue.



## **LONG-TERM CARE VALUATIONS**

**MR. BARTLEY L. MUNSON:** I will discuss, to varying degrees, the Society of Actuary's Task Force on Valuation Methods for LTC Insurance, various NAIC and federal interests, LTC reserves related to other products, and a word or two about reserves currently held by LTC insurers.

My goals are:

1. To introduce this product at what is the first, but surely will not be the last, session for LTC at a Valuation Actuary Symposium; and
2. To paint a context in which we can contemplate this union of LTC and the valuation actuary.

### **Stakeholders**

There are many stakeholders. I have identified the following six groups:

1. The actuarial profession and we individual professionals. Clearly, the reserve that we hold on LTC affects the design of the product, and vice versa. Clearly, the reserve we hold affects the solvency of the enterprise for which we work as we price the LTC product. The future of LTC insurance is unclear, but surely it will reflect either favorably or embarrassingly on us individually and on our profession. To a considerable extent, it is in our hands to decide which it will be.
2. The NAIC. I'll say a bit more about this later, but suffice to say that the NAIC has been very active on the subject of LTC insurance. The NAIC model act and model regulation have been in place several years. There is a large and growing Advisory Committee, now numbering nearly 50 interested persons. Lately the NAIC has been focusing especially on nonforfeiture values, which are very much related, of course, to reserves.
3. State Regulators. These, you might suggest, are closely related to the NAIC, and of course that is true. But not as much as we might like or we might think. We would like more consistency and action by the individual states in adopting the model act and model regulation. On the other hand, many states are impatient and want to move ahead in a more aggressive -- but not necessarily sound -- way than what the

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- models are permitting or will some day permit. Several states are individually perplexed over what to do with LTC regulation, especially nonforfeiture benefits.
4. Federal regulators. Many bills have been introduced in Congress lately. They tend to attempt to clarify the tax position (generally in a favorable manner to the insurance industry and consumer) and in the process often tie them to certain minimum standards in the product. Those standards usually include nonforfeiture benefits and some attempt to define what they should be, even in the absence of standardized reserve tables.
  5. Consumer organizations. These groups very actively are urging certain benefits and improvements in the product, such as nonforfeiture benefits, upgrades from old to newer (better, presumably) products by using the "accumulated equity," and rate stabilization. While the members of these organizations are not actuaries, many of us are working with them, and even the consumer organizations realize that these types of issues have much to do with the future solvency of the insurance enterprises.
  6. Consumers. Individual horror stories are shared in Congress. Articles such as one in the June 1991 issue of *Consumer Reports* lament the consumer's plight. Even our parents, friends or other family members, as they consider LTC insurance, reveal to us the difficulties of choosing a product that is expensive, prefunded with level premiums, and has the potential of increasing rates down the road.

### **Society of Actuaries Task Force on Valuation Methods for LTC Insurance**

This task force was recently formed. As it's chair, I reported to the SOA Board of Governors on October 20, 1991, regarding the staffing of the Task Force.

Our charge is as follows:

This task force will develop recommendations for the valuation of long-term care insurance products, incorporating, as appropriate, an interim method, available data, the valuation actuary concept, and methodologies suitable for the type of product being valued and its underwriting characteristics.

## LONG-TERM-CARE VALUATIONS

The membership of the Task Force is as found in Table 11. The Task Force was selected to represent a varied background, each having experience with valuation with LTC insurance or other related experience to bring to our efforts. While I'm open to adding a couple of people to plug holes that may be perceived, I do want to keep it small enough so we can nearly always have 100% attendance at our meetings and get our task completed as soon as possible. I suspect that will run at least a couple of years. We will discuss that at our first meeting in November 1991.

Since we have not yet met, it would be presumptuous of me to speak for what our major issues seem to be. However, in my opinion, they would include at least the following nine points:

1. We must balance the need for regulators, and others, to have an early and fast result, probably in the form of a table or tables, according to their anticipation, with the essential need to be responsible and provide answers that are professionally acceptable.
2. There is a great lack of data on which to base any reserve methods.
3. We must integrate this new product, with its challenges, with the Valuation Actuary concept and direction.
4. There are a significant variety of benefits that impact on the reserves. These include such major elements as nursing home care, home health care, and home care that is not necessarily medically required.
5. There are a variety of benefit triggers currently in the market, and these would impact the level of reserves.
6. We need to consider the impact of gender and marital status.
7. This is a somewhat unique product, in that it not only has multiple decrements to consider but also the insured may go in and out of claim status, at different amounts of benefit, in different sites, and with other elements such as inflation in benefits compounding the challenge.

TABLE 11

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## LONG-TERM-CARE VALUATIONS

8. This effort must be coordinated within the profession, including with various elements of the Society of Actuaries. Fortunately, we have five members on our task force who are also on the SOA LTC Experience Study Committee.
9. We must coordinate with the various stakeholders I identified earlier. We must keep them informed of our progress. At the same time, we must not mislead them to believe we have early, easy-to-apply answers.

### **Actuarial Standards Board (ASB)**

The ASB two-and-a-half years ago perceived a need to develop standards of practice for our profession in this LTC field. Our ASB Task Force on LTC Insurance developed such a standard as nine of us labored on it from 1989 until summer 1991.

Actuarial Standard of Practice (ASP) No. 18 was adopted by the ASB in July 1991. It will be distributed, in final printed booklet form, with the November 1991 issue of the *Actuarial Update*.

In general, the 29 sometimes lengthy responses we received to our exposure draft pointed out that the standard was longer and contained more "educational matter" than normally would be desirable. We reflected on that, but as a task force we agreed with the ASB's view that such would be appropriate for a new and emerging field. The standard will be on the examination syllabus for the SOA. It will need to be updated, as the products mature. When it is rewritten, over the years, it is likely the educational elements will be reduced. Currently, the task force is in hibernation.

Several methods for determining claim reserves are described, and reserve standards for contract reserves refer to the NAIC model and state statutes. As those laws and regulations develop, and as our profession's standards for reserves become articulated, one might expect this section of the ASP to be one that undergoes significant revisions.

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### **Society of Actuaries LTC Experience Committee**

This committee has been in existence for many years, with Sam Gutterman as chairperson.

The charge of the committee is:

**This Committee is concerned with the development and gathering of experience associated with long-term care. This may include experience from long-term-care insurance, continuing care retirement communities and public data.**

The committee last met on October 22, 1991, at the SOA Annual Meeting in Toronto, where we discussed the status of the first intercompany experience study and a variety of other issues. While sometimes it seems the whole world is waiting breathlessly for the publication of that first study, I think it is important to share a few characteristics of our effort in that regard. In total, the effort is appropriate and considerable, but the results will be disappointing for those who expect a large, useful volume of data. Here's why:

1. Seven companies contributed to the 1984-89 study.
2. Fifteen companies -- the original seven plus eight more -- promise to contribute 1990 experience.
3. Confidentiality of company data is maintained. For example, only one of the seven contributors is a group writer, and thus group experience will not be shown separately. Policy durations longer than five years are omitted. These are necessary parameters to the study, but they reduce its usefulness.
4. Almost all of the experience is in the first three policy years. For example, 57% of the exposure is in the first policy year. Less than 5% is beyond year three.
5. The data are not as homogeneous as one would like. They include different benefit triggers, different benefits, different amounts and site of care, etc.
6. There are not as many records as one would like, particularly after one weeds out the inevitable erroneous coding. This is always found in intercompany studies. It's found, probably to a greater extent, with a product that is new for the companies and their initial records, and that is new for the collection on an intercompany basis.



## LONG-TERM-CARE VALUATIONS

The relevance of all of this to LTC insurance valuation is obvious. We need reliable data. We won't have these. We will do the best we can with the data available from this intercompany study and other sources, and will appropriately describe the limitations of any methods or tables that we produce.

### **NAIC Model LTC Regulation**

This model, according to its January 1991 version, has a Section 15 called "Reserve Standards" that is devoted, for the most part, to reserves of LTC riders on life insurance. It suggests the reserves should be based on a multiple decrement model, or if certain conditions are met, single decrement approximations may be substituted. In the development of these reserves, the model says: "Due regard shall be given to the applicable policy provisions, marketing methods, administrative procedures and all other considerations," and it then goes on to list 19 such considerations. Importantly, for these writers the model concludes: "Any applicable valuation morbidity table shall be certified as appropriate as a statutory valuation table by a member of the American Academy of Actuaries."

As to the more typical stand-alone LTC products, this NAIC LTC model regulation merely states that "reserves shall be determined in accordance with . . .," and here the model says the state should site the law referring to minimum health insurance reserves, "the NAIC version of which requires reserves 'using a table established for reserve purposes by a qualified actuary and acceptable to the Commissioner.'"

### **NAIC Minimum Reserve Standards for Individual and Group Health Insurance Contracts**

This is the NAIC model that theoretically guides the basis for LTC reserves in the various states, as it does other types of health insurance products.

Suffice it to say that, with regard specifically to LTC, the only change that has been made in the model was one adopted in June 1991. It indicates that, unlike other health products, the reserve method to be used for LTC is a one-year full preliminary term, not two.

## **1991 SYMPOSIUM FOR THE VALUATION ACTUARY**

The other addition to that model was to add to the "Glossary of Technical Terms Used" a definition of LTC insurance. For the convenience of the reader, it follows in its entirety:

### **APPENDIX B. GLOSSARY OF TECHNICAL TERMS USED**

**LONG-TERM CARE INSURANCE:** Any insurance policy or rider advertised, marketed, offered or designed to provide benefits for not less than twelve (12) consecutive months for each covered person on an expense incurred, indemnity, prepaid or other basis, for one or more necessary or medically necessary diagnostic, preventive, therapeutic, rehabilitative, maintenance or personal care services, provided in a setting other than an acute care unit of a hospital. Such term also includes a policy or rider which provides for payment of benefits based upon cognitive impairment or the loss of functional capacity. Long-term care insurance may be issued by insurers; fraternal benefit societies; nonprofit health, hospital, and medical service corporations; prepaid health plans; health maintenance organizations or any similar organization to the extent they are otherwise authorized to issue life or health insurance. Long-term care insurance shall not include any insurance policy which is offered primarily to provide basic Medicare supplement coverage, basic hospital expense coverage, basic medical-surgical expense coverage, hospital confinement indemnity coverage, major medical expense coverage, disability income or related asset-protection coverage, accident only coverage, specified disease or specified accident coverage, or limited benefit health coverage.

### **NAIC (and State) Interests**

I'd like to touch a bit further on the particular interests in our subject as held by the state stakeholders.

Obviously, the state regulators are interested in the solvency of the insurance enterprise. They are equally interested in equity and consumer fairness. As regulators, and others, look at pricing, insurers sometimes are criticized because LTC premiums are too high, and thus the buyer is being gouged. More often, there seems to be concern that premiums are too low and companies are attempting to buy market shares; this produces concerns about solvency and more frequently expressed concerns about companies' intent to raise premiums. This leads to regulatory concern about "rate stabilization," a growing buzzword in LTC regulatory discussions. This, in turn, leads to discussion of lapse rates, a discussion that is often more confused than enlightening.

## **LONG-TERM-CARE VALUATIONS**

I briefly cite these subjects not to be critical of regulators or our profession but to point out that this is a field crying loudly for actuarial expertise and pricing and valuation stability.

Perhaps the current most visible debate in LTC products is nonforfeiture benefits. Sometimes an analogy is drawn to life insurance, but this is not a perfect analogy, by any means. Regulators realize there are no reserve standards that are really helpful for LTC, and therefore what can they base nonforfeiture benefits on, they ask. They turn to a return of a percent of the premium or an arbitrarily defined scale of reduced paid-up values. They are concerned about the form nonforfeiture benefits should take, how much the benefit should be, how it should be defined, and whether there should be options. All of that is within the more major questions of whether there even should be nonforfeiture benefits, and if so, should they be mandatorily offered to the buyer or included in the product.

In this environment it will be extremely difficult to produce actuarial valuation tables and/or methods that are responsible and still timely for the needs of the regulators.

### **Federal Interests**

We have heard a great deal about solvency of life insurers lately, and there is probably more to come. Within that context, we should realize that LTC is a likely future focus, for several reasons:

1. It is a product that involves a considerable amount of prefunding, not unlike life insurance.
2. It is sold primarily to the elderly, a market that is very difficult to treat with complete disclosure and understanding and that is given special attention by regulators and elected officials.
3. Some LTC carriers have little or no experience with prefunded products. The need to consider invested assets in relation to longer-term liabilities is a new and foreign concept to them.

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As mentioned earlier, in 1991 there have been several bills that have been introduced that would seek tax clarification of LTC insurance and would introduce minimum benefit standards that must be achieved if that tax treatment is to be realized.

One of those bills is S.846: Long-Term Care Insurance Consumer Protection Act, introduced by Senator Pryor. The interest of the federal government in this whole matter of consumer equity and nonforfeiture benefits is perhaps best summarized in the material that Senator Pryor's staff released with the bill. Those three paragraphs relating to nonforfeiture benefits are as follows:

Requires each policy to contain a nonforfeiture benefit which conforms to one of the 3 nonforfeiture models developed by the National Association of Insurance Commissioners (NAIC). At least one of the models identified by the NAIC must be a reduced paid-up model whereby policyholders would be guaranteed a specified percentage of benefits after a certain vesting period. Similar to a whole life policy or a home mortgage, a nonforfeiture benefit for long-term care insurance would assure that a policyholder did not have to forfeit vested equity in a policy should the policy lapse.

**Why Needed:** Because long-term care policies are typically held for 10 or 20 years before their benefits are used, the possibility of a policy lapsing during this period is significant. For example, assuming a conservative lapse rate of 10 percent per year, only 7 percent of policies purchased at age 65 are still in force at age 85, when they are most likely to need the coverage.

When a long-term care insurance policy lapses, the policyholder forfeits a significant amount of equity which has been built-up to pre-fund future needs. Individuals often pay into long-term care insurance policies for 10, 15, 20 years or more only to find that a premium increase suddenly makes the policy unaffordable. When this happens, policyholders surrender years of equity and are left with no long-term care protection whatsoever.

## LONG-TERM-CARE VALUATIONS

### Reserve Patterns -- LTC Insurance versus Life Insurance

It is instructive to compare the patterns and magnitudes of reserves that one finds for LTC insurance with those on a more familiar product, like permanent whole life insurance. There are an infinite number of comparisons we can make, but consider the following:

#### Assume

Reasonable plan design and reserve parameters, as follows:

Life Insurance:	Plan	Whole Life Paid up at 95 \$1,000 Death Benefit 1980 CSO
vs.		
Long-Term Care:	Plan	20-Day Elimination Period Nursing Home (NH) Benefit = \$10 per day Home Health Care (HHC) Benefit = \$10 per day
	Mortality	1983 Table "a"
	Interest	5.5%
	Method	One-Year Full Preliminary Term (FPT)
	and	Maximum Benefit Period of either a) 2 Years or b) Lifetime

#### Results

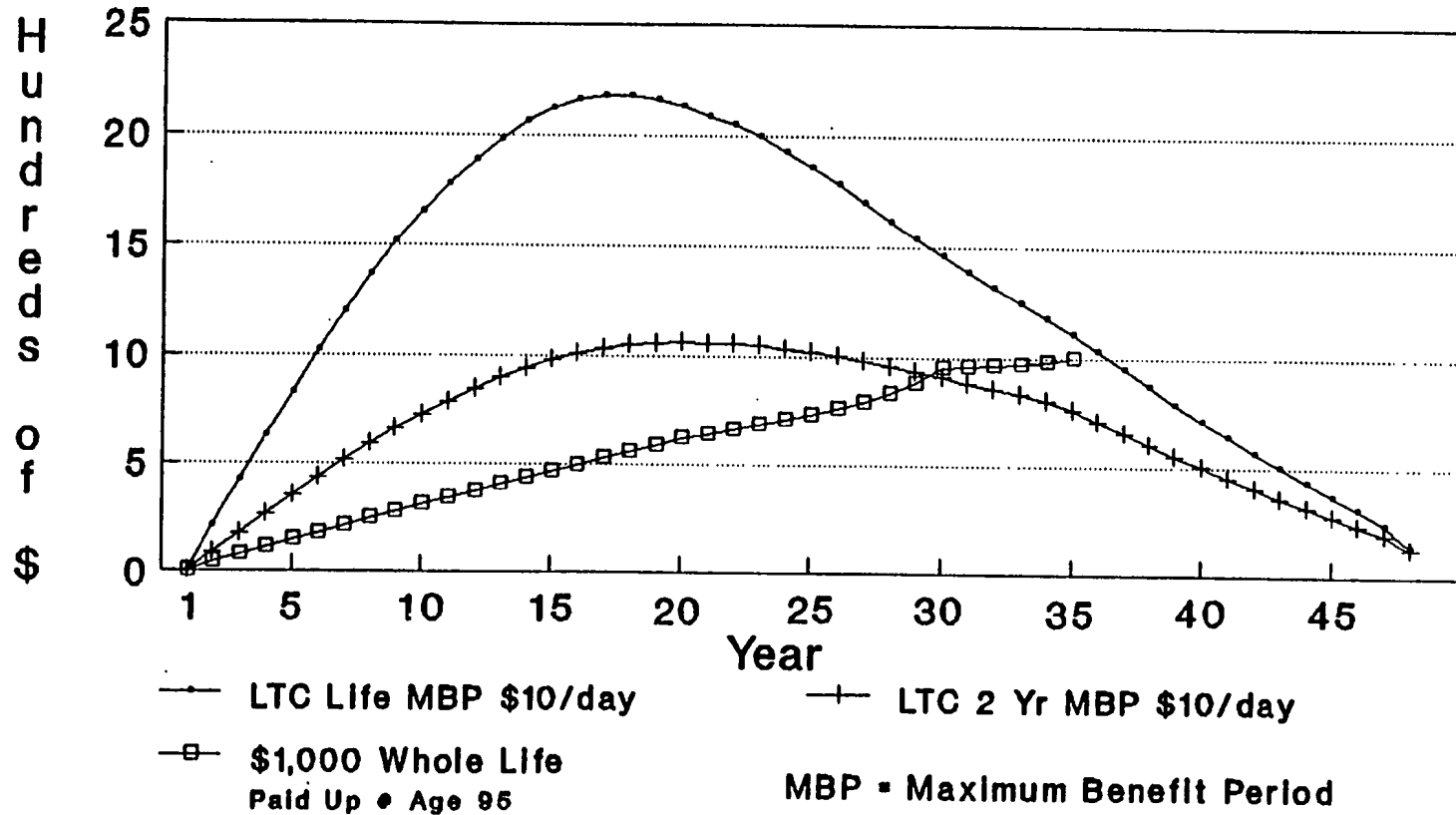
The resulting patterns (and, less importantly, magnitudes) of resulting contract reserves are shown in Chart 1.

#### **Effect of Mortality Assumption**

Actuaries working in LTC insurance are frequently heard to discuss rightfully the lack of good morbidity data. I have commented on that already. We also must recognize the importance of using appropriate mortality assumptions, and I thought it might be interesting to share some results from a simple model office that reveal how important that can be.

# CHART 1

## Reserve Patterns LTC Insurance vs. Life Insurance Issue Age 65



## LONG-TERM-CARE VALUATIONS

It is not necessary to consider the exact specifications on which this simple model office was based, but in order to become fairly comfortable with the results, consider the following assumptions:

1. Fairly typical LTC insurance plan (60-day elimination; four-year maximum benefit period; nursing home coverage; home health care covered at 75% of nursing home daily amount; etc.)
2. Reasonable pricing assumptions (two of five activities of daily living; commissions; other expenses; interest rate declining by year; etc.)
3. A model office, with \$10,000,000 of new premium in year one, increasing \$1,000,000 per year to \$15,000,000 per year for year six and following; issue ages distributed between 30 and 75; etc.

Model office results are shown for two cases:

1. Case 1 – Mortality according to 1983a Individual Annuity Table
2. Case 2 – Mortality according to 1980 CSO Table

All other assumptions are identical in both cases.

Results are summarized in Table 12 (with fields different between the two cases highlighted by the shaded screening).

**TABLE 12**

**Model Office Results (000 Omitted)**

Year	Premium	Benefits	Expenses	Stat Reserve	Increase Stat Reserve	Stat Underwriting Income	Interest Income	Stat Income Pre-Tax	Stat Tax	Stat Net Income	Stat Surplus
<b>Case 1 = 1983a Individual Annuity Mortality Table</b>											
1	\$10,000	\$1,282	\$6,751	\$0	\$0	\$1,968	\$222	\$2,190	\$1,024	\$1,165	\$1,165
2	19,416	2,874	8,594	8,804	8,804	(857)	885	28	3,246	(3,218)	(2,053)
5	48,266	9,798	14,170	84,191	33,429	(9,131)	5,365	(3,766)	4,418	(8,184)	(21,856)
10	92,146	28,925	20,746	361,884	67,504	(25,030)	21,997	(3,034)	7,077	(10,110)	(73,046)
15	122,611	55,161	26,396	744,364	79,834	(38,781)	46,493	7,712	10,203	(2,491)	(103,903)
20	142,771	85,948	31,843	1,134,942	75,091	(50,112)	75,313	25,201	13,252	11,949	(75,363)

**Case 2 = 1980 CSO Mortality Table**

1	\$10,000	\$1,282	\$6,751	\$0	\$0	\$1,968	\$222	\$2,190	\$1,024	\$1,165	\$1,165
2	19,416	2,874	8,594	6,938	6,938	1,009	885	1,895	3,246	(1,352)	(186)
5	48,266	9,798	14,170	66,110	26,206	(1,908)	5,365	3,457	4,418	(961)	(3,775)
10	92,146	28,925	20,746	283,359	52,654	(10,180)	21,997	11,816	7,077	4,740	5,480
15	122,611	55,161	26,396	581,032	61,864	(20,811)	46,493	25,682	10,203	15,479	59,429
20	142,771	85,948	31,843	882,600	57,546	(32,567)	75,313	42,745	13,252	29,494	176,979



## **RESERVES CURRENTLY HELD BY LTC INSURANCE CARRIERS**

**MS. HELEN HOFMANN:** I will review how we reserve our LTC products at Bankers Life and Casualty and discuss some of the issues we have had to face in this respect.

### **Company Background**

We have been selling LTC since late 1985, about six years. Bankers historically has and continues to market heavily in the senior citizen market. Prior to our introduction of the LTC products, we sold nursing home policies and riders with our Medicare supplement products. As a result, we already had experience on policies and riders covering skilled nursing care, intermediate care and custodial care benefits (about \$70 million of exposed premium since inception). Today we have data on LTC products on an exposure base of over \$300 million of premium since inception.

Like most other companies, our LTC products have evolved over the past six years. Initially, the average benefit period on policies purchased from us was three years. Our benefits were similar in some respects to the nursing home policies sold with Medicare supplement products. For example, in the early years we required a three-day prior hospitalization stay to receive benefits. Later, we offered "no prior hospitalization" as a benefit option. Today, no policies are sold with the prior hospitalization requirement.

The definition of care has changed from one of medical necessity to one more along the lines of disability. Initially, we didn't offer inflation benefits. Today, we do. The home health benefits have been expanded. Finally, today, we underwrite very differently than we did initially.

All of these changes in the product have had impact on our claim cost assumptions and experience.

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### **Active Life Reserves**

For active life reserves, we use a 3.5% interest rate. That is currently the maximum interest rate permitted by Illinois (we are an Illinois company).

We reserve current products on a one-year, preliminary-term basis. I believe the use of one-year preliminary term for LTC products is prevalent in the industry today even though technically, two-year preliminary term is the minimum reserve requirement for health products in most states today. One-year preliminary term is generally required to maintain adequate reserves. We consider our net GAAP reserves (GAAP reserves net of deferred acquisition costs) a good proxy for a gross premium valuation for testing reserve adequacy. A comparison of our net GAAP reserves to one-year and two-year, preliminary term statutory reserves shows that one-year, preliminary-term reserves are required to meet tests of adequacy. This is because the benefit reserve very quickly exceeds the acquisition expense reserve. The benefit reserve is very high on LTC due to the steep claim cost curve.

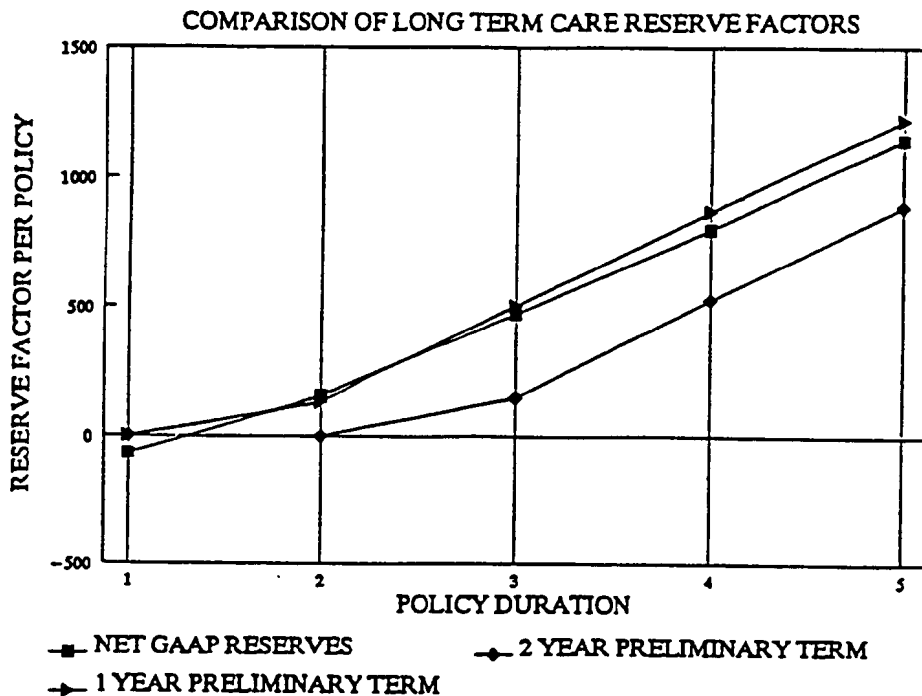
Chart 2 is an example of how net GAAP reserve factors on a block of LTC business compare to one- and two-year, preliminary-term statutory reserve factors:

The two-year, preliminary-term factors fall well below the GAAP net reserve factors, whereas the one-year, preliminary-term factor generally exceeds the net GAAP reserves.

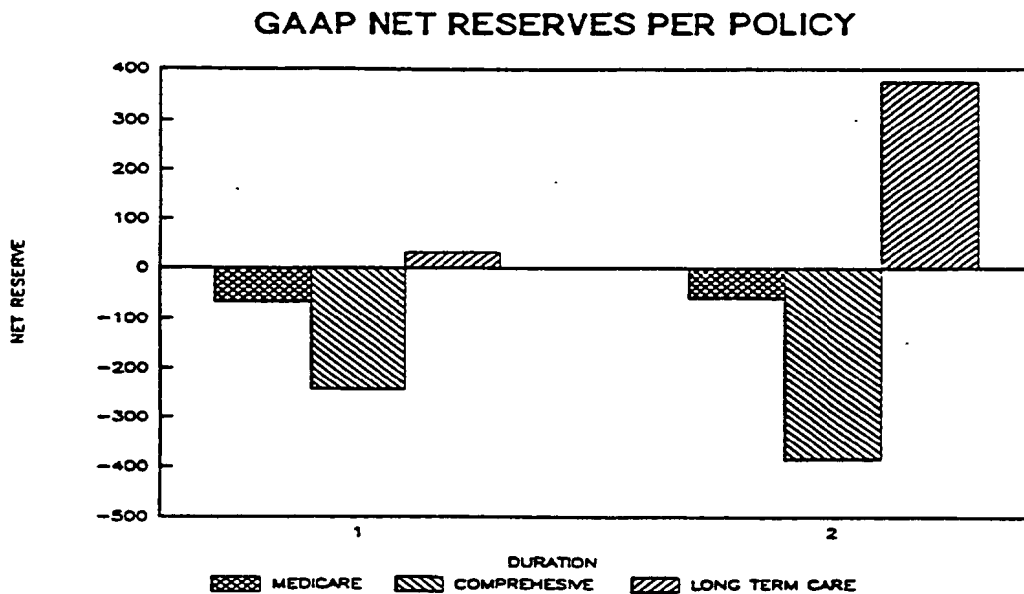
Chart 3 is a comparison of LTC net GAAP reserves to the net GAAP reserves of other major health products we sell. Reserves for LTC are much higher than other health products. The net GAAP reserve is negative for blocks of health business other than LTC after both one and two years. However, the net GAAP reserve for LTC is very close to zero after one year and very positive after two years. A two-year, preliminary-term reserve that begins at zero after two policy years would be inadequate for LTC.

# LONG-TERM-CARE VALUATIONS

## CHART 2



## CHART 3



## **1991 SYMPOSIUM FOR THE VALUATION ACTUARY**

Our claim cost assumptions have varied as a result of the various product features that evolved over time, as described earlier. However, we also have carefully monitored our actual claim costs against the claim costs assumed in our reserves. As a result, we have already used three generations of claim-cost curves in the reserving of our products. The impact of even relatively small shifts in the claim-cost assumptions can have a large impact on reserves.

Regarding the persistency assumption, we assume no lapses on a statutory basis. Only terminations due to mortality are used.

### **Claim Reserves**

As on our active life reserves, we use a 3.5% interest-rate assumption. When we cover GAAP reserves, we will discuss the importance of the interest-rate assumption on the claim reserves. We have used several different methodologies for our claim reserves.

When we first offered the product, the best information we had regarding claims was the data that had been used in the pricing of the product since no additional data were yet available. These data were a combination of (1) the experience we had on nursing home policies and riders on our Medicare supplement products and (2) the 1985 Nursing Home Survey. In addition, the majority of the liability was for claims incurred but not reported (IBNR), so we used a loss ratio approach.

As more experience became available on these products, we attempted to use a lag-factor approach. Many of the claims were still IBNR. This approach did not work out well for us. The data on which we based our lag factors fluctuated quite a bit, since the number of claims was small, and the size of the claims fairly large. In addition, the reported claims to which we were applying these lag factors experienced large variations from period to period.

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We are now using a tabular approach for our reported claims, and this has worked out fairly well. This is similar to the approach typically used for disability-income claim reserves. Given an incurred date, an elimination period, a benefit period and an assumed termination rate for claims, we are able to calculate a reserve for each reported claim. This reserve remains fairly stable from reporting period to reporting period.

For IBNR claims, we currently are using a percentage of earned premium. This percentage is based on past experience. For example, for claims incurred in the second quarter of 1991, we estimate the amount of claims that will be reported the first quarter following, second quarter following, etc., based on the past experience. Table 13 is an example of the development of these ratios. Given that the IBNR is expected to vary by quite a bit from period to period, this method has proven to be relatively stable for us.

**TABLE 13**  
**3/91 IBNR/Earned Premium (Percent)**

<u>Reported Quarter</u>	<u>Incurred Quarter</u>				
	<u>4Q89</u>	<u>1Q90</u>	<u>2Q90</u>	<u>3Q90</u>	<u>4Q90</u>
3Q90	4.7	11.4	18.4		
4Q90	1.2	3.4	12.3	21.8	
1Q91	0.4	1.6	3.2	13.9	21.4
Diagonal Average (most recent 3 qtrs.)	0.4	1.1	3.8	12.6	20.5
Accumulated Sum	0.4	1.5	5.3	17.9	38.4

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### **Tax Reserves**

The interest rate used is the rate required for tax reserving. Since our policies are generally guaranteed renewable, they qualify as life insurance reserves, so the interest rate depends on the issue date of the policy.

The two-year, preliminary-term method is used even though statutory reserves are based on one-year, preliminary term. The claim costs used are the same as those used in our statutory reserves, a requirement for health tax reserves for which there is no standard table.

### **GAAP Reserves**

The interest-rate assumption is based on the current interest rate whereas the statutory reserves are based on the 3.5% interest rate. For the claim reserves for most health products (except for disability income), the selection of an interest rate is not significant because the liability has a short duration. For LTC, the interest assumption becomes important because of the potential duration of the claim, particularly as we offer and sell longer benefit periods. For example, the difference between using an 8% interest rate and a 3.5% rate is \$3 to \$3.5 million on a \$55 million claim reserve.

The claim costs used are the same as those used for statutory reserves except an adjustment for underwriting selection is made on a GAAP basis.

Actual persistency that is different from the assumption used in GAAP reserves can cause more fluctuations in the GAAP financial results than would otherwise be expected. This is because the impact of the timing of the lapses in conjunction with the steep loss curve can cause large variations in the reserves. Few policies were sold in the past with nonforfeiture benefits. (They have not been a popular feature to date.) When the reserve is released and not offset by the payment of nonforfeiture benefits, the impact on financial results can be significant, if persistency varies from the original assumption. Changes in persistency rates can be further exacerbated by exchange programs offered to policyholders

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as new policy features emerge. It is very important to run projections of the GAAP results under different persistency assumptions in advance in order to be prepared for the range of results that can occur.

