

**TRANSACTIONS OF SOCIETY OF ACTUARIES  
1985-87 REPORTS**

REPORT OF THE COMMITTEE ON ANNUITIES

GROUP ANNUITY MORTALITY

ABSTRACT

This report presents the 1985 and 1986 calendar-year experience of retired individuals who are covered under insured pension plans in the U.S. and Canada. The report includes the experience of contracts providing insurer-guaranteed annuity benefits to ongoing pension plans and the experience of contracts covering closed groups of lives for which purchases are made by a single payment at issue (single-premium close-out business); it also includes contracts that do not contain insurer guarantees of future payments (such as direct-payment benefits).

The total data reported in this study include all annuities for which a benefit, once commenced, is to continue for the future lifetime of the annuitant. In cases of joint and survivor status, only the mortality and income of the original annuitant are included. Annuities having benefits limited to a specific number of years and those for which a contingent annuitant is receiving 100 percent of the payments are excluded from the study.

Data collection is done during the six months in the year following the experience year. It is possible that deaths will be reported subsequent to the gathering of data. No adjustment is made to the study results for the lag in the reporting of deaths.

The report format is very similar to that of the Group Annuity Mortality Report of 1983 and 1984 calendar-year experience. However, we have included additional tables that demonstrate the effect of including contracts that do not contain insurer guarantees of benefit payments. We have also included tables that summarize year-by-year improvement in mortality since 1981.

Eight major pension insurers submitted data in sufficient detail to allow the committee to break the total experience into subsets based on a single parameter or a combination of parameters. The committee believes the following series of tables produced data cells small enough to be relatively homogeneous yet large enough to be credible and in a format that facilitates analysis.

## FORMAT OF STUDY

Table 1 summarizes 1985 calendar-year exposures and deaths in ten-year age groups. Male and female data are displayed by number of lives and amount of income. Table 2 displays similar data for calendar-year 1986.

Tables 3–33 make extensive use of actual-to-expected (A/E) mortality ratios as a tool to assist analysis. The mortality basis for expected deaths is the 1983 Group Annuity Mortality (GAM) Table without projection. Expected deaths for females are based on the female mortality tables (as opposed to the standard six-year age setback in male mortality tables) except for Table 15, which is based on male mortality with no age setback.

In Tables 3–14, total data are divided into classification groups based on a single parameter (retirement class, benefit class, survivor status, or years since retirement). Each table displays exposure and A/E ratio for each classification group and the total data in the study (equaling totals shown on Tables 1 and 2) by five-year age bracket. (By definition, the sum of exposures in all classification groups equals the total exposure.)

TABLE 1  
SUMMARY OF EXPOSURES AND ACTUAL DEATHS FOR CALENDAR-YEAR 1985

Attained Age	Males		Females		Total	
	Exposure	Deaths	Exposure	Deaths	Exposure	Deaths
	Lives					
Under 55 . . . . .	4,090.58	72.00	2,889.91	18.00	6,980.49	90.00
55–59 . . . . .	43,299.71	656.00	17,016.15	146.00	60,315.86	802.00
60–64 . . . . .	123,040.09	2,386.00	50,603.92	565.00	173,644.01	2,951.00
65–69 . . . . .	223,999.93	6,226.00	93,571.37	1,368.00	317,571.30	7,594.00
70–74 . . . . .	207,718.42	9,000.00	90,306.94	2,050.00	298,025.36	11,050.00
75–79 . . . . .	137,102.94	9,186.00	65,194.85	2,426.00	202,297.79	11,612.00
80–84 . . . . .	71,953.72	7,141.00	35,412.31	2,137.00	107,366.03	9,278.00
85–89 . . . . .	28,655.87	4,287.00	14,095.45	1,437.00	42,751.32	5,724.00
90–94 . . . . .	8,411.94	1,812.00	4,179.97	671.00	12,591.91	2,483.00
95 and over	1,546.10	435.00	820.77	163.00	2,366.87	598.00
Total . . . . .	849,819.30	41,201.00	374,091.64	10,981.00	1,223,910.94	52,182.00
	Income					
Under 55 . . . . .	\$ 22,510,570	\$ 271,869	\$ 7,071,025	\$ 27,204	\$ 29,581,595	\$ 299,073
55–59 . . . . .	149,280,514	1,879,891	33,677,648	245,156	182,958,162	2,125,047
60–64 . . . . .	515,932,443	7,929,740	100,363,680	935,838	616,296,123	8,865,578
65–69 . . . . .	750,353,166	17,696,842	153,458,823	2,146,723	903,811,989	19,843,565
70–74 . . . . .	539,241,946	21,199,820	119,725,450	2,716,678	658,967,396	23,916,498
75–79 . . . . .	297,026,875	18,120,016	70,803,175	2,507,577	367,830,050	20,627,593
80–84 . . . . .	133,110,608	11,912,989	32,975,778	1,818,671	166,086,386	13,731,660
85–89 . . . . .	46,183,121	6,260,526	11,629,437	1,118,046	57,812,558	7,378,572
90–94 . . . . .	11,629,754	2,560,193	3,008,300	505,322	14,638,054	3,065,515
95 and over	1,879,718	554,717	566,822	117,143	2,446,540	671,860
Total . . . . .	\$2,467,148,715	\$88,386,603	\$533,280,138	\$12,138,358	\$3,000,428,853	\$100,524,961

GROUP ANNUITY MORTALITY

TABLE 2

SUMMARY OF EXPOSURES AND ACTUAL DEATHS FOR CALENDAR-YEAR 1986

Attained Age	Males		Females		Total	
	Exposure	Deaths	Exposure	Deaths	Exposure	Deaths
Lives						
Under 55 . . .	4,508.94	55.00	3,150.48	21.00	7,659.42	76.00
55-59 . . . .	44,010.72	627.00	16,677.86	112.00	60,688.58	739.00
60-64 . . . .	122,620.42	2,163.00	50,381.10	476.00	173,001.52	2,639.00
65-69 . . . .	227,995.35	5,699.41	95,512.26	1,261.00	323,507.61	6,960.41
70-74 . . . .	216,055.50	8,098.29	93,727.78	1,966.00	309,783.28	10,064.29
75-79 . . . .	146,182.97	8,610.00	68,834.32	2,324.00	215,017.29	10,934.00
80-84 . . . .	78,070.67	7,153.00	38,836.55	2,108.00	116,907.22	9,261.00
85-89 . . . .	31,484.42	4,005.00	15,650.49	1,406.00	47,134.91	5,411.00
90-94 . . . .	9,097.10	1,678.00	4,672.65	690.00	13,769.75	2,368.00
95 and over	1,718.13	369.00	982.08	201.00	2,700.21	570.00
Total . . . .	881,744.22	38,457.70	388,425.57	10,565.00	1,270,169.79	49,022.70
Income						
Under 55 . . .	\$ 26,885,497	\$ 214,776	\$ 7,651,114	\$ 27,866	\$ 34,536,611	\$ 242,642
55-59 . . . .	172,318,459	2,139,148	35,791,423	224,253	208,109,882	2,363,401
60-64 . . . .	547,715,401	7,772,781	107,961,748	979,232	655,677,149	8,752,013
65-69 . . . .	816,789,612	17,580,327	168,786,460	2,025,283	985,576,072	19,605,610
70-74 . . . .	589,074,176	19,862,440	130,383,351	2,603,139	719,457,527	22,465,579
75-79 . . . .	325,559,878	17,588,343	78,319,638	2,552,233	403,879,516	20,140,576
80-84 . . . .	140,770,574	12,474,386	37,099,496	1,927,061	177,870,070	14,401,447
85-89 . . . .	51,774,558	6,125,317	13,281,005	1,252,345	65,055,563	7,377,662
90-94 . . . .	12,199,270	2,212,512	3,471,969	517,975	15,671,239	2,730,487
95 and over	1,942,123	407,429	680,069	140,572	2,622,192	548,001
Total . . . .	\$2,685,029,548	\$86,377,459	\$583,426,273	\$12,249,959	\$3,268,455,821	\$98,627,418

The amount of exposure provides a key to the credibility of the data in each classification age cell and for the classification group in total. Mortality ratios are extremely useful in highlighting significant differences between classifications. Caution is advised in drawing any conclusions for experience at the very low or at the very high ages because exposures are rather limited.

*Retirement Class*

Tables 3-8 display total study data grouped by retirement class for calendar-year 1985, calendar-year 1986, and calendar-years 1985 and 1986 combined. Retirement classes are defined as follows:

1. Retirement prior to normal retirement date (NRD). This class consists of employees who retired before the NRD under a plan.
2. Retirement on or after NRD. This class consists of employees who retired on or after the NRD specified by the plan. The data include the experience of employees who are receiving payments providing for automatic retirement at the NRD even if the employee is still employed.

3. Retirement under a plan having no stated NRD. This class consists of employees retired under a plan with no stated NRD or where available information does not permit determination of whether a retirement is normal, early, or late.
4. Past NRD, not receiving payments. This class consists of employees working past NRD under a plan that provides for purchase of annuities, and the contract allows the commencement of such annuities to be deferred beyond the NRD. After payments begin, the employee moves to class 2.

### *Benefit Class*

Tables 9 and 10 display total study data grouped by benefit class for calendar-years 1985 and 1986 combined. Benefit classes are defined as follows:

1. Life annuities. This class consists of employees selecting a form of benefit that does not include a certain period or refund feature.
2. Life and certain annuities. This class consists of employees selecting a form of benefit that guarantees a specified minimum number of payments.
3. Modified cash refund. This class consists of employees selecting a form of benefit that provides for a lump-sum death benefit equal to the excess of a specified initial amount over the sum of income payments received prior to death.

TABLE 3  
EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEAR 1985  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Past NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives										
Under 55 .....	2,276.21	3.16	546.83	7.54	1,263.62	4.35	3.92	0.00	4,090.58	4.01
55-59 .....	26,355.60	1.88	4,555.58	1.68	12,372.19	2.50	16.34	0.00	43,299.71	2.03
60-64 .....	79,114.53	1.53	14,727.14	1.76	29,026.19	1.89	172.23	0.95	123,040.09	1.64
65-69 .....	109,337.08	1.32	63,643.45	1.40	50,538.96	1.51	480.44	0.71	223,999.93	1.38
70-74 .....	81,007.64	1.23	74,463.43	1.28	51,756.86	1.45	490.49	0.74	207,718.42	1.30
75-79 .....	36,061.49	1.22	57,619.66	1.24	43,189.79	1.26	232.00	0.74	137,102.94	1.24
80-84 .....	13,576.75	1.18	34,647.32	1.13	23,618.65	1.13	111.00	1.03	71,953.72	1.14
85-89 .....	4,019.69	1.14	15,210.55	1.14	9,379.63	1.18	46.00	0.49	28,655.87	1.15
90-94 .....	905.04	1.16	4,569.67	1.17	2,914.23	1.18	23.00	1.35	8,411.94	1.17
95 and over .....	146.44	1.11	882.75	1.03	511.91	1.11	5.00	0.73	1,546.10	1.06
Total .....	352,800.47	1.28	270,866.38	1.22	224,572.03	1.31	1,580.42	0.80	849,819.30	1.26
Male Income										
Under 55 .....	\$ 12,153,723	2.34	\$ 2,620,080	4.31	\$ 7,721,045	2.93	\$ 15,722	0.00	\$ 22,510,570	2.74
55-59 .....	92,828,378	1.47	14,389,556	1.18	41,971,539	2.32	91,041	0.00	149,280,514	1.68
60-64 .....	311,739,449	1.17	66,414,180	1.34	137,494,996	1.60	283,818	0.21	515,932,443	1.31
65-69 .....	338,839,617	1.12	206,114,052	1.25	204,575,774	1.25	823,723	0.40	750,353,166	1.19
70-74 .....	196,520,908	1.14	186,962,895	1.11	154,622,724	1.36	1,135,419	1.08	539,241,946	1.19
75-79 .....	72,925,677	1.09	126,934,520	1.12	96,739,463	1.19	427,215	0.66	297,026,875	1.14
80-84 .....	22,169,280	1.03	67,639,045	0.98	42,988,814	1.11	313,469	0.66	133,110,608	1.03
85-89 .....	5,347,449	1.12	27,363,387	1.02	13,356,630	1.06	115,655	0.61	46,183,121	1.04
90-94 .....	1,010,270	1.10	7,303,097	1.23	3,279,330	1.19	37,057	1.17	11,629,754	1.21
95 and over .....	193,281	1.11	1,194,932	1.08	484,848	1.11	6,657	0.90	1,879,718	1.09
Total .....	\$1,053,728,032	1.13	\$706,935,744	1.11	\$703,235,163	1.26	\$3,249,776	0.75	\$2,467,148,715	1.16

TABLE 4  
EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEAR 1985  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Past NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives										
Under 55 .....	1,769.94	4.09	480.52	2.86	637.45	2.87	2.00	0.00	2,889.91	3.65
55-59 .....	11,769.49	2.41	1,793.17	2.88	3,441.92	3.17	11.57	0.00	17,016.15	2.61
60-64 .....	33,015.76	2.00	7,240.57	2.38	10,310.10	1.94	37.49	0.00	50,603.92	2.04
65-69 .....	42,059.18	1.64	29,297.84	1.69	22,084.69	1.59	129.66	2.46	93,571.37	1.65
70-74 .....	29,271.09	1.28	35,462.70	1.49	25,385.15	1.39	188.00	2.64	90,306.94	1.40
75-79 .....	13,855.83	1.23	29,340.46	1.22	21,820.56	1.24	178.00	1.45	65,194.85	1.23
80-84 .....	5,472.75	1.15	17,007.61	1.20	12,779.95	1.15	152.00	1.28	35,412.31	1.17
85-89 .....	1,720.34	1.32	7,399.10	1.28	4,918.01	1.19	58.00	1.45	14,095.45	1.25
90-94 .....	383.25	1.28	2,411.74	1.28	1,371.98	1.17	13.00	1.15	4,179.97	1.24
95 and over .....	86.71	0.93	487.24	0.96	246.82	0.76	0.00	0.00	820.77	0.90
Total .....	139,404.34	1.41	130,920.95	1.31	102,996.63	1.27	769.72	1.56	374,091.64	1.32
Female Income										
Under 55 .....	\$ 4,519,854	2.08	\$ 805,765	3.67	\$ 1,741,308	2.26	\$ 4,098	0.00	\$ 7,071,025	2.30
55-59 .....	23,629,683	1.83	2,992,110	3.18	7,040,633	3.09	15,222	0.00	33,677,648	2.22
60-64 .....	65,968,260	1.66	11,294,696	2.25	23,050,480	1.57	50,244	0.00	100,363,680	1.71
65-69 .....	65,750,849	1.66	45,251,660	1.54	42,281,033	1.53	175,281	4.43	153,458,823	1.59
70-74 .....	35,932,967	1.24	46,091,154	1.50	37,442,025	1.46	259,304	2.90	119,725,450	1.41
75-79 .....	13,730,689	1.13	31,734,103	1.17	24,954,538	1.22	383,845	0.82	70,803,175	1.18
80-84 .....	4,075,899	0.95	16,909,780	1.06	11,743,520	1.13	246,579	1.94	32,975,778	1.08
85-89 .....	1,092,021	1.24	6,676,755	1.16	3,788,386	1.22	72,275	1.10	11,629,437	1.18
90-94 .....	234,871	1.07	1,854,171	1.38	907,804	1.20	11,454	1.91	3,008,300	1.30
95 and over .....	66,104	0.81	335,953	1.02	164,765	0.64	0	0.00	566,822	0.88
Total .....	\$215,001,197	1.38	\$163,946,147	1.28	\$153,114,492	1.31	\$1,218,302	1.65	\$533,280,138	1.32

TABLE 5

EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEAR 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Past NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives										
Under 55 . . . . .	2,698.14	2.01	451.59	4.85	1,356.38	3.69	2.83	0.00	4,508.94	2.78
55-59 . . . . .	26,587.42	1.60	5,152.02	2.32	12,255.05	2.42	16.23	0.00	44,010.72	1.91
60-64 . . . . .	78,254.26	1.40	16,667.65	1.58	27,562.36	1.72	136.15	1.20	122,620.42	1.50
65-69 . . . . .	102,377.36	1.14	75,832.66	1.29	49,121.65	1.40	663.68	0.90	227,995.35	1.25
70-74 . . . . .	73,960.31	1.10	89,910.95	1.08	51,601.50	1.23	582.74	0.78	216,055.50	1.12
75-79 . . . . .	33,839.19	1.07	68,854.38	1.05	43,221.73	1.16	267.67	1.19	146,182.97	1.09
80-84 . . . . .	12,956.14	0.99	39,865.46	1.04	25,136.07	1.10	113.00	1.11	78,070.67	1.05
85-89 . . . . .	3,738.30	0.99	17,501.78	0.95	10,196.84	1.01	47.50	1.57	31,484.42	0.98
90-94 . . . . .	855.33	1.15	5,044.55	0.98	3,176.22	1.00	21.00	1.54	9,097.10	1.00
95 and over . . . . .	134.90	0.58	979.65	0.77	596.58	0.91	7.00	1.65	1,718.13	0.80
Total . . . . .	335,401.35	1.12	320,260.69	1.06	224,224.38	1.18	1,857.80	1.08	881,744.22	1.11
Male Income										
Under 55 . . . . .	\$ 15,135,948	1.28	\$ 2,779,651	4.51	\$ 8,957,499	1.87	\$ 12,399	0.00	\$ 26,885,497	1.79
55-59 . . . . .	105,682,546	1.34	16,134,347	1.68	50,445,926	2.34	55,640	0.00	172,318,459	1.66
60-64 . . . . .	332,714,836	1.11	72,726,047	1.13	142,022,824	1.48	251,694	0.33	547,715,401	1.21
65-69 . . . . .	345,086,054	1.04	261,649,849	1.05	208,759,987	1.22	1,293,722	0.36	816,789,612	1.09
70-74 . . . . .	185,124,842	0.96	238,386,880	1.00	164,233,397	1.13	1,329,057	0.52	589,074,176	1.02
75-79 . . . . .	65,523,425	0.96	157,670,330	0.99	101,904,276	1.06	461,847	0.96	325,559,878	1.00
80-84 . . . . .	19,048,928	0.99	74,398,431	1.01	46,966,030	1.04	357,185	1.88	140,770,574	1.02
85-89 . . . . .	4,157,468	0.97	30,242,736	0.92	16,807,194	0.92	567,160	0.36	51,774,558	0.92
90-94 . . . . .	1,008,617	1.00	7,344,292	0.98	3,782,222	0.98	64,139	3.36	12,199,270	0.99
95 and over . . . . .	149,880	0.27	1,217,455	0.82	566,242	0.85	8,546	1.17	1,942,123	0.77
Total . . . . .	\$1,073,632,544	1.02	\$862,550,018	1.00	\$744,445,597	1.13	\$4,401,389	0.81	\$2,685,029,548	1.05

TABLE 6  
EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEAR 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Past NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives										
Under 55 .....	2,124.34	2.81	404.55	5.96	621.42	6.87	0.17	0.00	3,150.48	4.00
55-59 .....	11,525.12	2.10	1,936.50	1.87	3,195.34	1.92	20.90	0.00	16,677.86	2.04
60-64 .....	32,607.30	1.63	8,260.92	1.78	9,419.45	2.05	93.43	0.00	50,381.10	1.73
65-69 .....	39,721.23	1.36	35,092.93	1.68	20,471.11	1.39	226.99	2.00	95,512.26	1.49
70-74 .....	26,478.38	1.28	42,649.57	1.28	24,405.18	1.32	194.65	1.62	93,727.78	1.29
75-79 .....	12,826.03	1.06	34,686.64	1.10	21,158.24	1.16	163.41	0.59	68,834.32	1.11
80-84 .....	4,965.98	1.08	20,314.15	1.04	13,396.42	1.06	160.00	1.08	38,836.55	1.05
85-89 .....	1,587.33	1.10	8,713.86	1.10	5,291.30	1.11	58.00	0.85	15,650.49	1.10
90-94 .....	368.10	1.23	2,759.23	1.08	1,524.32	1.20	21.00	2.60	4,672.65	1.14
95 and over .....	82.41	0.70	597.66	0.94	302.01	0.93	0.00	0.00	982.08	0.91
Total .....	132,286.22	1.26	155,416.01	1.16	99,784.79	1.18	938.55	1.21	388,425.57	1.19
Female Income										
Under 55 .....	\$ 5,257,555	1.64	\$ 798,778	3.41	\$ 1,594,240	3.39	\$ 541	0.00	\$ 7,651,114	2.19
55-59 .....	25,471,071	1.73	3,365,859	3.74	6,936,827	1.65	17,666	0.00	35,791,423	1.90
60-64 .....	71,835,277	1.55	13,722,932	1.76	22,354,913	1.97	48,626	0.00	107,961,748	1.66
65-69 .....	68,684,169	1.29	58,021,213	1.64	41,730,382	1.13	350,696	1.23	168,786,460	1.37
70-74 .....	33,663,673	1.21	57,829,830	1.20	38,605,865	1.35	283,983	0.33	130,383,351	1.24
75-79 .....	11,788,244	1.07	39,978,669	1.04	26,239,446	1.16	313,279	0.63	78,319,638	1.08
80-84 .....	3,380,342	0.89	19,637,267	1.03	13,794,803	1.02	287,084	0.91	37,099,496	1.01
85-89 .....	895,372	1.22	7,772,732	1.20	4,544,726	1.09	68,175	1.10	13,281,005	1.16
90-94 .....	242,288	1.10	2,082,808	1.14	1,121,690	1.15	25,183	3.56	3,471,969	1.16
95 and over .....	58,828	0.52	424,623	0.98	196,618	0.86	0	0.00	680,069	0.89
Total .....	\$221,276,819	1.26	\$203,634,711	1.18	\$157,119,510	1.19	\$1,395,233	1.02	\$583,426,273	1.20



TABLE 7

EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Past NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives										
Under 55 .....	4,974.35	2.55	998.42	6.24	2,620.00	4.01	6.75	0.00	8,599.52	3.37
55-59 .....	52,943.02	1.74	9,707.60	2.02	24,627.24	2.46	32.57	0.00	87,310.43	1.97
60-64 .....	157,368.79	1.47	31,394.79	1.67	56,588.55	1.81	308.38	1.06	245,660.51	1.57
65-69 .....	211,714.44	1.23	139,476.11	1.34	99,660.61	1.46	1,144.12	0.82	451,995.28	1.32
70-74 .....	154,967.95	1.17	164,374.38	1.17	103,358.36	1.34	1,073.23	0.76	423,773.92	1.21
75-79 .....	69,900.68	1.15	126,474.04	1.13	86,411.52	1.21	499.67	0.98	283,285.91	1.16
80-84 .....	26,532.89	1.09	74,512.78	1.08	48,754.72	1.11	224.00	1.07	150,024.39	1.09
85-89 .....	7,757.99	1.07	32,712.33	1.04	19,576.47	1.09	93.50	1.04	60,140.29	1.06
90-94 .....	1,760.37	1.15	9,614.22	1.07	6,090.45	1.09	44.00	1.44	17,509.04	1.08
95 and over .....	281.34	0.85	1,862.40	0.89	1,108.49	1.00	12.00	1.25	3,264.23	0.92
Total .....	688,201.82	1.20	591,127.07	1.14	448,796.41	1.25	3,438.22	0.95	1,731,563.52	1.19
Male Income										
Under 55 .....	\$ 27,289,671	1.75	\$ 5,399,731	4.42	\$ 16,678,544	2.36	\$ 28,121	0.00	\$ 49,396,067	2.22
55-59 .....	198,510,924	1.40	30,523,903	1.44	92,417,465	2.33	146,681	0.00	321,598,973	1.67
60-64 .....	644,454,285	1.14	139,140,227	1.23	279,517,820	1.54	535,512	0.26	1,063,647,844	1.26
65-69 .....	683,925,671	1.08	467,763,901	1.14	413,335,761	1.24	2,117,445	0.38	1,567,142,778	1.14
70-74 .....	381,645,750	1.05	425,349,775	1.05	318,856,121	1.24	2,464,476	0.78	1,128,316,122	1.10
75-79 .....	138,449,102	1.03	284,604,850	1.05	198,643,739	1.12	889,062	0.82	622,586,753	1.07
80-84 .....	41,218,208	1.01	142,037,476	1.00	89,954,844	1.07	670,654	1.32	273,881,182	1.02
85-89 .....	9,504,917	1.05	57,606,123	0.97	30,163,824	0.98	682,815	0.40	97,957,679	0.98
90-94 .....	2,018,887	1.05	14,647,389	1.10	7,061,552	1.08	101,196	2.52	23,829,024	1.10
95 and over .....	343,161	0.72	2,412,387	0.94	1,051,090	0.97	15,203	1.05	3,821,841	0.93
Total .....	\$2,127,360,576	1.08	\$1,569,485,762	1.05	\$1,447,680,760	1.20	\$7,651,165	0.79	\$5,152,178,263	1.10

TABLE 8

EXPERIENCE BY RETIREMENT CLASS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Prior to NRD		On/After NRD		No Stated NRD		Fast NRD With No Payment		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives										
Under 55 . . . . .	3,894.28	3.42	885.07	4.38	1,258.87	4.84	2.17	0.00	6,040.39	3.83
55-59 . . . . .	23,294.61	2.26	3,729.67	2.35	6,637.26	2.57	32.47	0.00	33,694.01	2.33
60-64 . . . . .	65,623.06	1.82	15,501.49	2.06	19,729.55	1.99	130.92	0.00	100,985.02	1.89
65-69 . . . . .	81,780.41	1.51	64,390.77	1.68	42,555.80	1.50	356.65	2.17	189,083.63	1.57
70-74 . . . . .	55,749.47	1.28	78,112.27	1.37	49,790.33	1.35	382.65	2.13	184,034.72	1.34
75-79 . . . . .	26,681.86	1.15	64,027.10	1.16	42,978.80	1.20	341.41	1.04	134,029.17	1.17
80-84 . . . . .	10,438.73	1.12	37,321.76	1.12	26,176.37	1.10	312.00	1.18	74,248.86	1.11
85-89 . . . . .	3,307.67	1.21	16,112.96	1.18	10,209.31	1.15	116.00	1.16	29,745.94	1.17
90-94 . . . . .	751.35	1.25	5,170.97	1.17	2,896.30	1.18	34.00	2.04	8,852.62	1.19
95 and over . . . . .	169.12	0.81	1,084.90	0.95	548.83	0.85	0.00	0.00	1,802.85	0.91
Total . . . . .	271,690.56	1.34	286,336.96	1.23	202,781.42	1.22	1,708.27	1.38	762,517.21	1.25
Female Income										
Under 55 . . . . .	\$ 9,777,409	1.85	\$ 1,604,543	3.54	\$ 3,335,548	2.80	\$ 4,639	0.00	\$ 14,722,139	2.24
55-59 . . . . .	49,100,754	1.78	6,357,969	3.48	13,977,460	2.38	32,888	0.00	69,469,071	2.05
60-64 . . . . .	137,803,537	1.61	25,017,628	1.98	45,405,393	1.77	98,870	0.00	208,325,428	1.69
65-69 . . . . .	134,435,018	1.47	103,272,873	1.60	84,011,415	1.33	525,977	2.38	322,245,283	1.48
70-74 . . . . .	69,596,640	1.22	103,920,984	1.33	76,047,890	1.40	543,287	1.57	250,108,801	1.32
75-79 . . . . .	25,518,933	1.10	71,712,772	1.10	51,193,984	1.19	697,124	0.73	149,122,813	1.13
80-84 . . . . .	7,456,241	0.92	36,547,047	1.04	25,538,323	1.07	533,663	1.38	70,075,274	1.04
85-89 . . . . .	1,987,393	1.23	14,449,487	1.18	8,333,112	1.15	140,450	1.10	24,910,442	1.17
90-94 . . . . .	477,159	1.08	3,936,979	1.25	2,029,494	1.17	36,637	2.99	6,480,269	1.23
95 and over . . . . .	124,932	0.67	760,576	1.00	361,383	0.76	0	0.00	1,246,891	0.89
Total . . . . .	\$436,278,016	1.32	\$367,580,858	1.22	\$310,234,002	1.25	\$2,613,535	1.32	\$1,116,706,411	1.25

TABLE 9  
 EXPERIENCE BY BENEFIT CLASS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Life		Life and Certain		Modified Cash Refund		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives								
Under 55 .....	6,262.24	2.82	1,222.96	5.24	1,114.32	4.35	8,599.52	3.37
55-59 .....	62,140.50	1.99	12,270.19	2.26	12,899.74	1.59	87,310.43	1.97
60-64 .....	161,059.52	1.60	39,967.93	1.58	44,633.06	1.45	245,660.51	1.57
65-69 .....	281,896.65	1.37	85,500.68	1.25	84,597.95	1.20	451,995.28	1.32
70-74 .....	254,671.21	1.27	89,403.14	1.15	79,699.57	1.10	423,773.92	1.21
75-79 .....	172,056.92	1.19	59,906.60	1.11	51,322.39	1.12	283,285.91	1.16
80-84 .....	100,349.45	1.10	25,490.11	1.07	24,184.83	1.09	150,024.39	1.09
85-89 .....	42,984.30	1.05	7,146.92	1.07	10,009.07	1.08	60,140.29	1.06
90-94 .....	13,079.23	1.08	1,491.38	1.06	2,938.43	1.13	17,509.04	1.08
95 and over .....	2,623.05	0.91	243.81	0.84	397.37	1.07	3,264.23	0.92
Total .....	1,097,123.07	1.21	322,643.72	1.16	311,796.73	1.14	1,731,563.52	1.19
Male Income								
Under 55 .....	\$ 36,068,848	1.79	\$ 4,619,039	4.95	\$ 8,708,180	2.69	\$ 49,396,067	2.22
55-59 .....	231,825,628	1.67	39,762,128	2.02	50,011,217	1.41	321,598,973	1.67
60-64 .....	712,568,399	1.25	150,129,114	1.37	200,950,331	1.19	1,063,647,844	1.26
65-69 .....	1,026,589,768	1.17	260,061,077	1.14	280,491,933	1.04	1,567,142,778	1.14
70-74 .....	703,526,611	1.15	228,404,781	1.05	196,384,730	0.98	1,128,316,122	1.10
75-79 .....	386,271,568	1.09	133,484,094	1.02	102,831,091	1.04	622,586,753	1.07
80-84 .....	186,635,442	1.02	46,661,115	1.07	40,584,625	1.01	273,881,182	1.02
85-89 .....	72,179,356	0.98	10,986,525	0.95	14,791,798	1.00	97,957,679	0.98
90-94 .....	18,667,647	1.10	1,650,404	0.93	3,510,973	1.17	23,829,024	1.10
95 and over .....	3,194,348	0.94	234,163	0.76	393,330	0.96	3,821,841	0.93
Total .....	\$3,377,527,615	1.12	\$875,992,440	1.09	\$898,658,208	1.04	\$5,152,178,263	1.10

TABLE 10  
EXPERIENCE BY BENEFIT CLASS FOR CALENDAR-YEARS 1985 AND 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Life		Life and Certain		Modified Cash Refund		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives								
Under 55 . . . . .	4,413.56	3.90	835.30	3.54	791.53	3.77	6,040.39	3.83
55-59 . . . . .	23,852.67	2.31	4,497.56	1.81	5,343.78	2.82	33,694.01	2.33
60-64 . . . . .	66,900.25	1.94	14,623.57	1.66	19,461.20	1.87	100,985.02	1.89
65-69 . . . . .	120,778.15	1.60	29,553.53	1.47	38,751.95	1.55	189,083.63	1.57
70-74 . . . . .	116,340.48	1.38	30,801.52	1.26	36,892.72	1.29	184,034.72	1.34
75-79 . . . . .	89,303.08	1.19	20,836.51	1.06	23,889.58	1.18	134,029.17	1.17
80-84 . . . . .	53,317.38	1.11	8,823.74	1.05	12,107.74	1.16	74,248.86	1.11
85-89 . . . . .	22,509.46	1.20	2,551.62	1.07	4,684.86	1.09	29,745.94	1.17
90-94 . . . . .	7,069.00	1.21	462.67	1.11	1,320.95	1.07	8,852.62	1.19
95 and over . . . . .	1,529.86	0.92	65.99	0.66	207.00	0.91	1,802.85	0.91
Total . . . . .	506,013.89	1.27	113,052.01	1.18	143,451.31	1.25	762,517.21	1.25
Female Income								
Under 55 . . . . .	\$ 10,202,287	2.49	\$ 1,922,212	1.96	\$ 2,597,640	1.47	\$ 14,722,139	2.24
55-59 . . . . .	48,439,386	1.96	9,444,468	1.11	11,585,217	3.24	69,469,071	2.05
60-64 . . . . .	140,106,821	1.63	28,773,994	1.67	39,444,613	1.90	208,325,428	1.69
65-69 . . . . .	205,552,791	1.47	50,711,944	1.48	65,980,548	1.49	322,245,283	1.48
70-74 . . . . .	156,640,536	1.29	43,539,793	1.27	49,928,472	1.47	250,108,801	1.32
75-79 . . . . .	99,689,026	1.15	23,133,566	1.01	26,300,221	1.14	149,122,813	1.13
80-84 . . . . .	51,566,801	1.05	7,977,327	0.95	10,531,146	1.08	70,075,274	1.04
85-89 . . . . .	19,834,280	1.18	1,800,584	1.18	3,275,578	1.14	24,910,442	1.17
90-94 . . . . .	5,328,416	1.27	402,835	0.80	749,018	1.16	6,480,269	1.23
95 and over . . . . .	1,093,143	0.90	41,599	0.47	112,149	0.89	1,246,891	0.89
Total . . . . .	\$738,453,487	1.24	\$167,748,322	1.20	\$210,504,602	1.34	\$1,116,706,411	1.25

*Survivor Status*

Tables 11 and 12 display total study data grouped by survivor status for calendar-years 1985 and 1986 combined. Survivor status is defined as follows:

1. Single life. This class consists of employees not electing a joint and survivor form of benefit.
2. Joint life. This class consists of employees electing a joint and survivor form of benefit, measuring the experience of the original annuitant (the employee). Contingent annuitant experience (exposures and deaths) are not included.

TABLE 11  
EXPERIENCE BY SURVIVOR STATUS FOR CALENDAR-YEARS 1985 AND 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Single Life		Joint Life		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives						
Under 55 . . .	5,833.25	3.19	2,766.27	3.73	8,599.52	3.37
55-59 . . . . .	61,545.18	1.78	25,765.25	2.42	87,310.43	1.97
60-64 . . . . .	167,868.19	1.57	77,792.32	1.56	245,660.51	1.57
65-69 . . . . .	325,518.45	1.34	126,476.83	1.26	451,995.28	1.32
70-74 . . . . .	334,370.15	1.23	89,403.77	1.14	423,773.92	1.21
75-79 . . . . .	246,025.61	1.17	37,260.30	1.09	283,285.91	1.16
80-84 . . . . .	133,079.49	1.10	16,944.90	1.02	150,024.39	1.09
85-89 . . . . .	53,762.39	1.07	6,377.90	0.97	60,140.29	1.06
90-94 . . . . .	16,227.29	1.09	1,281.75	1.01	17,509.04	1.08
95 and over . .	3,072.91	0.95	191.32	0.59	3,264.23	0.92
Total . . . . .	1,347,302.91	1.19	384,260.61	1.18	1,731,563.52	1.19
Male Income						
Under 55 . . .	\$ 30,459,512	2.30	\$ 18,936,555	2.10	\$ 49,396,067	2.22
55-59 . . . . .	205,970,057	1.41	115,628,916	2.13	321,598,973	1.67
60-64 . . . . .	636,263,141	1.24	427,384,703	1.27	1,063,647,844	1.26
65-69 . . . . .	959,191,490	1.16	607,951,288	1.11	1,567,142,778	1.14
70-74 . . . . .	790,485,993	1.14	337,830,129	1.02	1,128,316,122	1.10
75-79 . . . . .	494,066,409	1.09	128,520,344	0.97	622,586,753	1.07
80-84 . . . . .	224,643,864	1.05	49,237,318	0.91	273,881,182	1.02
85-89 . . . . .	80,516,158	1.00	17,441,521	0.89	97,957,679	0.98
90-94 . . . . .	20,654,226	1.09	3,174,798	1.12	23,829,024	1.10
95 and over . .	3,374,062	0.94	447,779	0.79	3,821,841	0.93
Total . . . . .	\$3,445,624,912	1.11	\$1,706,553,351	1.07	\$5,152,178,263	1.10

*Years Since Retirement*

Tables 13 and 14 display total study data grouped by years since retirement for calendar-years 1985 and 1986 combined. The table format highlights summarized results for "select periods" 0-1, 2-5, 6-10, and 11 and more years.

TABLE 12  
 EXPERIENCE BY SURVIVOR STATUS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Single Life		Joint Life		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives						
Under 55 . . .	5,679.47	3.25	360.92	12.81	6,040.39	3.83
55-59 . . . . .	30,251.86	2.09	3,442.15	4.40	33,694.01	2.33
60-64 . . . . .	92,128.01	1.88	8,857.01	2.00	100,985.02	1.89
65-69 . . . . .	176,805.80	1.57	12,277.83	1.53	189,083.63	1.57
70-74 . . . . .	177,056.63	1.34	6,978.09	1.27	184,034.72	1.34
75-79 . . . . .	131,982.79	1.17	2,046.38	1.00	134,029.17	1.17
80-84 . . . . .	73,537.74	1.11	711.12	1.04	74,248.86	1.11
85-89 . . . . .	29,485.11	1.17	260.83	1.35	29,745.94	1.17
90-94 . . . . .	8,796.62	1.19	56.00	0.83	8,852.62	1.19
95 and over . .	1,795.44	0.91	7.41	1.16	1,802.85	0.91
Total . . . . .	727,519.47	1.25	34,997.74	1.47	762,517.21	1.25
Female Income						
Under 55 . . .	\$ 13,749,992	1.85	\$ 972,147	7.65	\$ 14,722,139	2.24
55-59 . . . . .	61,228,856	1.58	8,240,215	5.53	69,469,071	2.05
60-64 . . . . .	185,983,850	1.70	22,341,578	1.53	208,325,428	1.69
65-69 . . . . .	294,707,255	1.45	27,538,028	1.73	322,245,283	1.48
70-74 . . . . .	236,748,238	1.33	13,360,563	1.16	250,108,801	1.32
75-79 . . . . .	145,217,149	1.13	3,905,664	1.11	149,122,813	1.13
80-84 . . . . .	68,814,684	1.05	1,260,590	0.93	70,075,274	1.04
85-89 . . . . .	24,508,166	1.17	402,276	1.26	24,910,442	1.17
90-94 . . . . .	6,383,090	1.23	97,179	1.25	6,480,269	1.23
95 and over . .	1,239,448	0.88	7,443	1.20	1,246,891	0.89
Total . . . . .	\$1,038,580,728	1.24	\$78,125,683	1.52	\$1,116,706,411	1.25

### Male vs. Female

Table 15 displays a comparison of male and female mortality experience for calendar-years 1985 and 1986 combined. This table was developed by calculating total-study female expected deaths using male mortality (no age setback), recomputing female A/E mortality ratios, and comparing these female ratios to those for males.

### Guaranteed Status

Tables 16-21 display total study data grouped by guaranteed status for calendar-year 1985, calendar-year 1986, and calendar-years 1985 and 1986 combined. Guaranteed status is defined as follows:

1. Guaranteed. Future payments are guaranteed by insurer.
2. Nonguaranteed. Future payments are not guaranteed by insurer.

TABLE 13

EXPERIENCE BY YEARS SINCE RETIREMENT FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Years Since Retirement									
	0-1		2-5		6-10		11 and Over		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives										
Under 55 . . . .	4,397.93	3.98	3,113.63	2.54	874.10	3.38	213.86	2.53	8,599.52	3.37
55-59 . . . . .	40,761.22	2.08	43,187.05	1.83	2,722.46	2.69	639.70	2.27	87,310.43	1.97
60-64 . . . . .	81,672.12	1.49	117,270.71	1.55	43,675.68	1.69	3,042.00	2.48	245,660.51	1.57
65-69 . . . . .	66,427.77	1.31	230,516.90	1.25	121,454.34	1.36	33,596.27	1.59	451,995.28	1.32
70-74 . . . . .	16,431.22	1.30	68,344.58	1.17	238,577.02	1.16	100,421.10	1.34	423,773.92	1.21
75-79 . . . . .	8,261.16	1.23	20,095.27	1.18	48,280.78	1.11	206,648.70	1.16	283,285.91	1.16
80-84 . . . . .	3,972.08	1.21	8,675.11	1.13	9,993.23	1.01	127,383.97	1.09	150,024.39	1.09
85-89 . . . . .	1,702.67	0.98	2,970.09	1.07	3,096.25	0.96	52,371.28	1.07	60,140.29	1.06
90-94 . . . . .	425.55	1.18	794.42	1.11	788.33	0.88	15,500.74	1.09	17,509.04	1.08
95 and over . .	99.98	0.99	169.67	0.74	196.67	0.52	2,797.91	0.97	3,264.23	0.92
Total . . . . .	224,151.70	1.38	495,137.43	1.27	469,658.86	1.19	542,615.53	1.14	1,731,563.52	1.19
Male Income										
Under 55 . . . .	\$ 27,394,692	2.41	\$ 16,311,358	1.45	\$ 5,027,432	4.01	\$ 662,585	0.67	\$ 49,396,067	2.22
55-59 . . . . .	175,980,475	1.79	130,112,977	1.53	11,934,596	1.84	3,570,925	0.49	321,598,973	1.67
60-64 . . . . .	442,599,951	1.21	512,047,304	1.25	95,408,398	1.43	13,592,191	1.64	1,063,647,844	1.26
65-69 . . . . .	272,208,989	1.07	844,327,695	1.10	383,075,235	1.18	67,530,859	1.60	1,567,142,778	1.14
70-74 . . . . .	54,960,856	1.13	222,610,307	1.05	625,060,639	1.07	225,684,320	1.22	1,128,316,122	1.10
75-79 . . . . .	21,222,318	1.08	52,538,354	1.16	114,838,963	1.00	433,987,118	1.07	622,586,753	1.07
80-84 . . . . .	9,216,904	0.87	18,027,212	1.05	21,537,453	1.01	225,099,613	1.03	273,881,182	1.02
85-89 . . . . .	5,033,425	0.53	5,644,684	1.08	6,148,611	0.80	81,130,959	1.01	97,957,679	0.98
90-94 . . . . .	746,649	1.09	1,530,227	0.99	1,159,305	0.91	20,392,843	1.12	23,829,024	1.10
95 and over . .	216,342	0.79	311,744	0.57	268,177	0.55	3,025,578	1.03	3,821,841	0.93
Total . . . . .	\$1,009,580,601	1.16	\$1,803,461,862	1.13	\$1,264,458,809	1.09	\$1,074,676,991	1.08	\$5,152,178,263	1.10

TABLE 14

EXPERIENCE BY YEARS SINCE RETIREMENT FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Years Since Retirement									
	0-1		2-5		6-10		11 and Over		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives										
Under 55.....	2,397.40	4.76	2,684.49	3.53	736.17	2.71	222.33	0.00	6,040.39	3.83
55-59 .....	14,082.64	2.70	17,003.62	2.08	2,279.50	2.11	328.25	1.83	33,694.01	2.33
60-64 .....	31,711.86	1.77	47,238.89	1.86	19,830.97	2.12	2,203.30	1.95	100,985.02	1.89
65-69 .....	30,988.41	1.71	94,346.64	1.52	50,327.37	1.56	13,421.21	1.59	189,083.63	1.57
70-74 .....	9,257.78	1.40	33,624.46	1.38	98,084.16	1.29	43,068.32	1.41	184,034.72	1.34
75-79 .....	4,443.15	1.33	10,102.03	1.23	25,577.42	1.16	93,906.57	1.16	134,029.17	1.17
80-84 .....	2,118.19	1.24	4,474.60	1.14	6,839.22	0.93	60,816.85	1.12	74,248.86	1.11
85-89 .....	853.04	1.19	1,772.68	1.27	2,289.34	1.26	24,830.88	1.16	29,745.94	1.17
90-94 .....	261.30	1.32	566.58	1.24	560.41	1.14	7,464.33	1.18	8,852.62	1.19
95 and over....	79.28	0.46	116.00	0.78	151.33	0.68	1,456.24	0.97	1,802.85	0.91
Total .....	96,193.05	1.56	211,929.99	1.44	206,675.89	1.28	247,718.28	1.17	762,517.21	1.25
Female Income										
Under 55.....	\$ 6,371,520	2.31	\$ 6,186,658	2.08	\$ 1,880,510	2.95	\$ 283,451	0.00	\$ 14,722,139	2.24
55-59 .....	34,991,892	2.32	29,647,400	1.93	4,259,883	1.02	569,896	0.55	69,469,071	2.05
60-64 .....	83,193,263	1.34	95,789,456	1.94	25,593,853	1.91	3,748,856	1.31	208,325,428	1.69
65-69 .....	64,811,199	1.56	171,975,934	1.41	71,132,252	1.58	14,325,898	1.34	322,245,283	1.48
70-74 .....	15,784,285	1.33	55,965,834	1.34	131,700,808	1.29	46,657,874	1.39	250,108,801	1.32
75-79 .....	6,313,199	1.36	14,509,383	1.22	31,628,743	1.13	96,671,488	1.10	149,122,813	1.13
80-84 .....	2,791,162	0.92	5,346,438	1.17	8,078,556	0.91	53,859,118	1.06	70,075,274	1.04
85-89 .....	986,793	1.24	1,684,707	1.35	2,620,066	1.13	19,618,876	1.16	24,910,442	1.17
90-94 .....	182,847	1.39	536,747	1.10	663,655	1.51	5,097,020	1.20	6,480,269	1.23
95 and over....	82,609	0.17	99,718	0.82	176,300	0.74	888,264	1.02	1,246,891	0.89
Total .....	\$215,508,769	1.42	\$381,742,275	1.43	\$277,734,626	1.28	\$241,720,741	1.13	\$1,116,706,411	1.25



TABLE 15  
 COMPARISON OF MALE AND FEMALE MORTALITY EXPERIENCE  
 FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Exposure		A/E Ratio		Ratio of Female to Male Mortality
	Male	Female	Male*	Female	
Lives					
Under 55 .....	8,599.52	6,040.39	3.37	1.61	0.48
55-59 .....	87,310.43	33,694.01	1.97	1.03	0.52
60-64 .....	245,660.51	100,985.02	1.57	0.88	0.56
65-69 .....	451,995.28	189,083.63	1.32	0.69	0.53
70-74 .....	423,773.92	184,034.72	1.21	0.65	0.54
75-79 .....	283,285.91	134,029.17	1.16	0.65	0.56
80-84 .....	150,024.39	74,248.86	1.09	0.66	0.60
85-89 .....	60,140.29	29,745.94	1.06	0.73	0.69
90-94 .....	17,509.04	8,852.62	1.08	0.84	0.77
95 and over .....	3,264.23	1,802.85	0.92	0.76	0.83
Total .....	1,731,563.52	762,517.21	1.19	0.69	0.58
Income					
Under 55 .....	\$ 49,396,067	\$ 14,722,139	2.22	0.94	0.42
55-59 .....	321,598,973	69,469,071	1.67	0.91	0.54
60-64 .....	1,063,647,844	208,325,428	1.26	0.78	0.62
65-69 .....	1,567,142,778	322,245,283	1.14	0.65	0.57
70-74 .....	1,128,316,122	250,108,801	1.10	0.64	0.58
75-79 .....	622,586,753	149,122,813	1.07	0.63	0.59
80-84 .....	273,881,182	70,075,274	1.02	0.62	0.60
85-89 .....	97,957,679	24,910,442	0.98	0.73	0.75
90-94 .....	23,829,024	6,480,269	1.10	0.86	0.79
95 and over .....	3,821,841	1,246,891	0.93	0.76	0.82
Total .....	\$5,152,178,263	\$1,116,706,411	\$1.10	0.67	0.61

\*Expected deaths for both males and females using male mortality.

TABLE 16  
EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEAR 1985  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives						
Under 55.....	2,939.36	4.12	1,151.22	3.75	4,090.58	4.01
55-59.....	25,730.20	1.93	17,569.51	2.19	43,299.71	2.03
60-64.....	80,209.18	1.62	42,830.91	1.68	123,040.09	1.64
65-69.....	165,832.16	1.36	58,167.77	1.45	223,999.93	1.38
70-74.....	166,630.11	1.26	41,088.31	1.47	207,718.42	1.30
75-79.....	115,187.62	1.21	21,915.32	1.37	137,102.94	1.24
80-84.....	61,876.06	1.12	10,077.66	1.21	71,953.72	1.14
85-89.....	24,921.04	1.15	3,734.83	1.15	28,655.87	1.15
90-94.....	7,493.61	1.17	918.33	1.17	8,411.94	1.17
95 and over.....	1,378.60	1.09	167.50	0.81	1,546.10	1.06
Total.....	652,197.94	1.23	197,621.36	1.40	849,819.30	1.26
Male Income						
Under 55.....	\$ 13,835,833	3.58	\$ 8,674,737	1.43	\$ 22,510,570	2.74
55-59.....	78,227,280	1.83	71,053,234	1.51	149,280,514	1.68
60-64.....	281,928,366	1.33	234,004,077	1.28	515,932,443	1.31
65-69.....	486,681,176	1.21	263,671,990	1.17	750,353,166	1.19
70-74.....	385,706,318	1.15	153,535,628	1.29	539,241,946	1.19
75-79.....	226,315,498	1.13	70,711,377	1.16	297,026,875	1.14
80-84.....	104,926,139	1.05	28,184,469	0.93	133,110,608	1.03
85-89.....	36,585,426	1.07	9,597,695	0.94	46,183,121	1.04
90-94.....	9,234,450	1.24	2,395,304	1.09	11,629,754	1.21
95 and over.....	1,557,797	1.16	321,921	0.79	1,879,718	1.09
Total.....	\$1,624,998,283	1.16	\$842,150,432	1.17	\$2,467,148,715	1.16

TABLE 17  
 EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEAR 1985  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives						
Under 55 . . . . .	1,965.79	3.61	924.12	3.76	2,889.91	3.65
55-59 . . . . .	10,721.62	2.76	6,294.53	2.34	17,016.15	2.61
60-64 . . . . .	35,505.88	2.17	15,098.04	1.75	50,603.92	2.04
65-69 . . . . .	71,544.20	1.66	22,027.17	1.59	93,571.37	1.65
70-74 . . . . .	74,231.74	1.40	16,075.20	1.38	90,306.94	1.40
75-79 . . . . .	55,453.68	1.23	9,741.17	1.19	65,194.85	1.23
80-84 . . . . .	30,415.40	1.15	4,996.91	1.29	35,412.31	1.17
85-89 . . . . .	12,251.93	1.24	1,843.52	1.32	14,095.45	1.25
90-94 . . . . .	3,670.30	1.22	509.67	1.42	4,179.97	1.24
95 and over . . . . .	726.77	0.92	94.00	0.70	820.77	0.90
Total . . . . .	296,487.31	1.31	77,604.33	1.38	374,091.64	1.32
Female Income						
Under 55 . . . . .	\$ 4,750,922	1.96	\$ 2,320,103	2.98	\$ 7,071,025	2.30
55-59 . . . . .	18,883,105	2.49	14,794,543	1.87	33,677,648	2.22
60-64 . . . . .	61,824,221	1.97	38,539,459	1.28	100,363,680	1.71
65-69 . . . . .	107,751,486	1.65	45,707,337	1.45	153,458,823	1.59
70-74 . . . . .	90,883,533	1.47	28,841,917	1.24	119,725,450	1.41
75-79 . . . . .	54,937,229	1.25	15,865,946	0.92	70,803,175	1.18
80-84 . . . . .	25,488,843	1.11	7,486,935	0.97	32,975,778	1.08
85-89 . . . . .	8,980,137	1.22	2,649,300	1.07	11,629,437	1.18
90-94 . . . . .	2,438,043	1.34	570,257	1.13	3,008,300	1.30
95 and over . . . . .	480,672	0.94	86,150	0.60	566,822	0.88
Total . . . . .	\$376,418,191	1.37	\$156,861,947	1.16	\$533,280,138	1.32

TABLE 18  
 EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEAR 1986  
 EXPECTED MORTALITY BASIS--1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives						
Under 55 . . . . .	2,889.34	2.69	1,619.60	2.94	4,508.94	2.78
55-59 . . . . .	25,522.41	1.76	18,488.31	2.12	44,010.72	1.91
60-64 . . . . .	76,827.79	1.54	45,792.63	1.43	122,620.42	1.50
65-69 . . . . .	163,309.14	1.25	64,686.21	1.25	227,995.35	1.25
70-74 . . . . .	168,173.51	1.13	47,881.99	1.10	216,055.50	1.12
75-79 . . . . .	120,071.56	1.07	26,111.41	1.15	146,182.97	1.09
80-84 . . . . .	65,523.03	1.06	12,547.64	1.01	78,070.67	1.05
85-89 . . . . .	26,711.74	0.98	4,772.68	0.99	31,484.42	0.98
90-94 . . . . .	7,933.28	1.02	1,163.82	0.86	9,097.10	1.00
95 and over . . . . .	1,504.22	0.83	213.91	0.59	1,718.13	0.80
Total . . . . .	658,466.02	1.10	223,278.20	1.15	881,744.22	1.11
Male Income						
Under 55 . . . . .	\$ 15,349,517	2.42	\$ 11,535,980	0.97	\$ 26,885,497	1.79
55-59 . . . . .	87,567,185	1.44	84,751,274	1.89	172,318,459	1.66
60-64 . . . . .	290,769,310	1.24	256,946,091	1.18	547,715,401	1.21
65-69 . . . . .	523,465,041	1.08	293,324,571	1.10	816,789,612	1.09
70-74 . . . . .	415,115,759	1.03	173,958,417	1.00	589,074,176	1.02
75-79 . . . . .	245,720,585	0.98	79,839,293	1.07	325,559,878	1.00
80-84 . . . . .	110,472,232	1.04	30,298,342	0.94	140,770,574	1.02
85-89 . . . . .	41,589,946	0.91	10,184,612	0.93	51,774,558	0.92
90-94 . . . . .	10,017,770	0.97	2,181,500	1.08	12,199,270	0.99
95 and over . . . . .	1,606,577	0.84	335,546	0.47	1,942,123	0.77
Total . . . . .	\$1,741,673,922	1.03	\$943,355,626	1.07	\$2,685,029,548	1.05

TABLE 19  
 EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEAR 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives						
Under 55.....	2,109.17	4.02	1,041.31	3.97	3,150.48	4.00
55-59.....	10,241.26	1.89	6,436.60	2.28	16,677.86	2.04
60-64.....	34,460.75	1.80	15,920.35	1.58	50,381.10	1.73
65-69.....	71,102.57	1.55	24,409.69	1.29	95,512.26	1.49
70-74.....	75,508.79	1.31	18,218.99	1.18	93,727.78	1.29
75-79.....	57,387.91	1.11	11,446.41	1.11	68,834.32	1.11
80-84.....	32,739.63	1.05	6,096.92	1.06	38,836.55	1.05
85-89.....	13,346.10	1.09	2,304.39	1.15	15,650.49	1.10
90-94.....	4,037.48	1.13	635.17	1.21	4,672.65	1.14
95 and over....	859.08	0.92	123.00	0.87	982.08	0.91
Total.....	301,792.74	1.19	86,632.83	1.19	388,425.57	1.19
Female Income						
Under 55.....	\$ 5,057,399	1.84	\$ 2,593,715	2.91	\$ 7,651,114	2.19
55-59.....	19,586,163	1.69	16,205,260	2.16	35,791,423	1.90
60-64.....	65,133,717	1.69	42,828,031	1.62	107,961,748	1.66
65-69.....	117,342,331	1.36	51,444,129	1.40	168,786,460	1.37
70-74.....	99,217,101	1.25	31,166,250	1.23	130,383,351	1.24
75-79.....	60,895,278	1.09	17,424,360	1.06	78,319,638	1.08
80-84.....	29,159,214	1.02	7,940,282	1.00	37,099,496	1.01
85-89.....	10,409,396	1.15	2,871,609	1.20	13,281,005	1.16
90-94.....	2,777,623	1.14	694,346	1.22	3,471,969	1.16
95 and over....	569,649	0.95	110,420	0.59	680,069	0.89
Total.....	\$410,147,871	1.19	\$173,278,402	1.24	\$583,426,273	1.20

TABLE 20

EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Male Lives						
Under 55 . . . . .	5,828.70	3.41	2,770.82	3.27	8,599.52	3.37
55-59 . . . . .	51,252.61	1.85	36,057.82	2.15	87,310.43	1.97
60-64 . . . . .	157,036.97	1.58	88,623.54	1.55	245,660.51	1.57
65-69 . . . . .	329,141.30	1.31	122,853.98	1.34	451,995.28	1.32
70-74 . . . . .	334,803.62	1.19	88,970.30	1.27	423,773.92	1.21
75-79 . . . . .	235,259.18	1.14	48,026.73	1.25	283,285.91	1.16
80-84 . . . . .	127,399.09	1.09	22,625.30	1.10	150,024.39	1.09
85-89 . . . . .	51,632.78	1.06	8,507.51	1.06	60,140.29	1.06
90-94 . . . . .	15,426.89	1.10	2,082.15	1.00	17,509.04	1.08
95 and over . . . . .	2,882.82	0.96	381.41	0.69	3,264.23	0.92
Total . . . . .	1,310,663.96	1.17	420,899.56	1.27	1,731,563.52	1.19
Male Income						
Under 55 . . . . .	\$ 29,185,350	2.97	\$ 20,210,717	1.17	\$ 49,396,067	2.22
55-59 . . . . .	165,794,465	1.63	155,804,508	1.72	321,598,973	1.67
60-64 . . . . .	572,697,676	1.28	490,950,168	1.22	1,063,647,844	1.26
65-69 . . . . .	1,010,146,217	1.14	556,996,561	1.13	1,567,142,778	1.14
70-74 . . . . .	800,822,077	1.09	327,494,045	1.14	1,128,316,122	1.10
75-79 . . . . .	472,036,083	1.05	150,550,670	1.11	622,586,753	1.07
80-84 . . . . .	215,398,371	1.05	58,482,811	0.94	273,881,182	1.02
85-89 . . . . .	78,175,372	0.99	19,782,307	0.94	97,957,679	0.98
90-94 . . . . .	19,252,220	1.10	4,576,804	1.08	23,829,024	1.10
95 and over . . . . .	3,164,374	1.00	657,467	0.63	3,821,841	0.93
Total . . . . .	\$3,366,672,205	1.09	\$1,785,506,058	1.12	\$5,152,178,263	1.10

TABLE 21  
 EXPERIENCE BY GUARANTEED STATUS FOR CALENDAR-YEARS 1985 AND 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	Guaranteed		Nonguaranteed		Total	
	Exposure	A/E Ratio	Exposure	A/E Ratio	Exposure	A/E Ratio
Female Lives						
Under 55.....	4,074.96	3.82	1,965.43	3.87	6,040.39	3.83
55-59.....	20,962.88	2.34	12,731.13	2.31	33,694.01	2.33
60-64.....	69,966.63	1.98	31,018.39	1.66	100,985.02	1.89
65-69.....	142,646.77	1.61	46,436.86	1.43	189,083.63	1.57
70-74.....	149,740.53	1.36	34,294.19	1.27	184,034.72	1.34
75-79.....	112,841.59	1.17	21,187.58	1.15	134,029.17	1.17
80-84.....	63,155.03	1.10	11,093.83	1.17	74,248.86	1.11
85-89.....	25,598.03	1.16	4,147.91	1.23	29,745.94	1.17
90-94.....	7,707.78	1.17	1,144.84	1.31	8,852.62	1.19
95 and over....	1,585.85	0.92	217.00	0.80	1,802.85	0.91
Total.....	598,280.05	1.25	164,237.16	1.28	762,517.21	1.25
Female Income						
Under 55.....	\$ 9,808,321	1.90	\$ 4,913,818	2.94	\$ 14,722,139	2.24
55-59.....	38,469,268	2.08	30,999,803	2.02	69,469,071	2.05
60-64.....	126,957,938	1.83	81,367,490	1.46	208,325,428	1.69
65-69.....	225,093,817	1.50	97,151,466	1.42	322,245,283	1.48
70-74.....	190,100,634	1.35	60,008,167	1.23	250,108,801	1.32
75-79.....	115,832,507	1.17	33,290,306	0.99	149,122,813	1.13
80-84.....	54,648,057	1.06	15,427,217	0.98	70,075,274	1.04
85-89.....	19,389,533	1.18	5,520,909	1.14	24,910,442	1.17
90-94.....	5,215,666	1.24	1,264,603	1.18	6,480,269	1.23
95 and over....	1,050,321	0.94	196,570	0.59	1,246,891	0.89
Total.....	\$786,566,062	1.27	\$330,140,349	1.20	\$1,116,706,411	1.25

*Summary Comparison*

Tables 22–25 display a quick summary of results for both calendar years included in the current study (1985 and 1986). The table format highlights total exposures and A/E mortality ratios summarized for the major data cells for each year in the study, and the change in A/E ratios between the two study years. These tables provide a quick overview of the data included in the study and an indication of variability of data by calendar year.

TABLE 22  
SUMMARY OF GROUP ANNUITY MORTALITY EXPERIENCE BY MALE LIVES  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1985		1986		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	849,819	1.26	881,744	1.11	-0.15
By Retirement Class					
Prior to NRD	352,800	1.28	335,401	1.12	-0.16
On/After NRD	270,866	1.22	320,261	1.06	-0.16
No Stated NRD	224,572	1.31	224,224	1.18	-0.13
Past NRD/No Payment	1,580	0.80	1,858	1.08	0.28
By Benefit Class					
Life	530,692	1.31	566,431	1.12	-0.19
Life and Certain	163,652	1.22	158,992	1.10	-0.12
Modified Cash Refund	155,475	1.15	156,322	1.12	-0.03
By Survivor Class					
Single Life	671,920	1.26	675,383	1.11	-0.15
Joint Life	177,899	1.27	206,361	1.11	-0.16
By Years Since Retirement					
0-1	107,693	1.40	116,459	1.36	-0.04
2-5	246,614	1.35	248,523	1.19	-0.16
6-10	233,636	1.28	236,023	1.10	-0.18
11+	261,876	1.22	280,739	1.07	-0.15
By Attained Age					
Under 55	4,091	4.01	4,509	2.78	-1.23
55-59	43,300	2.03	44,011	1.91	-0.12
60-64	123,040	1.64	122,620	1.50	-0.14
65-69	224,000	1.38	227,995	1.25	-0.13
70-74	207,718	1.30	216,055	1.12	-0.18
75-79	137,103	1.24	146,183	1.09	-0.15
80-84	71,954	1.14	78,071	1.05	-0.09
85-89	28,656	1.15	31,484	0.98	-0.17
90-94	8,412	1.17	9,097	1.00	-0.17
95 and over	1,546	1.06	1,718	0.80	-0.26
Comparison of Female/ Male		0.58		0.59	0.01



TABLE 23

SUMMARY OF GROUP ANNUITY MORTALITY EXPERIENCE BY MALE INCOME  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1985		1986		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	\$2,467,148,715	1.16	\$2,685,029,548	1.05	-0.11
By Retirement Class					
Prior to NRD	\$1,053,728,032	1.13	\$1,073,632,544	1.02	-0.11
On/After NRD	706,935,744	1.11	862,550,018	1.00	-0.11
No Stated NRD	703,235,163	1.26	744,445,597	1.13	-0.13
Past NRD/No Payment	3,249,776	0.75	4,401,389	0.81	0.06
By Benefit Class					
Life	\$1,605,451,771	1.19	\$1,772,075,844	1.05	-0.14
Life and Certain	432,272,641	1.15	443,719,799	1.03	-0.12
Modified Cash Refund	429,424,303	1.07	469,233,905	1.02	-0.05
By Survivor Class					
Single Life	\$1,691,877,852	1.17	\$1,753,747,060	1.06	-0.11
Joint Life	775,270,863	1.15	931,282,488	1.01	-0.14
By Years Since Retirement					
0-1	\$ 465,598,764	1.20	\$ 543,981,837	1.12	-0.08
2-5	870,636,031	1.21	932,825,831	1.06	-0.15
6-10	616,875,037	1.16	647,583,772	1.02	-0.14
11+	514,038,883	1.13	560,638,108	1.04	-0.09
By Attained Age					
Under 55	\$ 22,510,570	2.74	\$ 26,885,497	1.79	-0.95
55-59	149,280,514	1.68	172,318,459	1.66	-0.02
60-64	515,932,443	1.31	547,715,401	1.21	-0.10
65-69	750,353,166	1.19	816,789,612	1.09	-0.10
70-74	539,241,946	1.19	589,074,176	1.02	-0.17
75-79	297,026,875	1.14	325,559,878	1.00	-0.14
80-84	133,110,608	1.03	140,770,574	1.02	-0.01
85-89	46,183,121	1.04	51,774,558	0.92	-0.12
90-94	11,629,754	1.21	12,199,270	0.99	-0.22
95 and over	1,879,718	1.09	1,942,123	0.77	-0.32
Comparison of Female/ Male		0.60		0.61	0.01

TABLE 24

SUMMARY OF GROUP ANNUITY MORTALITY EXPERIENCE BY FEMALE LIVES  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1985		1986		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	374,404	1.32	388,426	1.19	-0.13
By Retirement Class					
Prior to NRD	139,404	1.41	132,286	1.26	-0.15
On/After NRD	130,921	1.31	155,416	1.16	-0.15
No Stated NRD	102,997	1.27	99,785	1.18	-0.09
Past NRD/No Payment	770	1.56	939	1.21	-0.35
By Benefit Class					
Life	245,360	1.35	260,654	1.19	-0.16
Life and Certain	57,373	1.23	55,679	1.13	-0.10
Modified Cash Refund	71,359	1.30	72,092	1.21	-0.09
By Survivor Class					
Single Life	358,354	1.31	369,165	1.18	-0.13
Joint Life	15,737	1.71	19,260	1.28	-0.43
By Years Since Retirement					
0-1	46,876	1.62	49,317	1.49	-0.13
2-5	103,937	1.53	107,993	1.37	-0.16
6-10	103,676	1.35	103,000	1.21	-0.14
11+	119,603	1.23	128,115	1.11	-0.12
By Attained Age					
Under 55	2,890	3.65	3,150	4.00	0.35
55-59	17,016	2.61	16,678	2.04	-0.57
60-64	50,604	2.04	50,381	1.73	-0.31
65-69	93,571	1.65	95,512	1.49	-0.16
70-74	90,307	1.40	93,728	1.29	-0.11
75-79	65,195	1.23	68,834	1.11	-0.12
80-84	35,412	1.17	38,837	1.05	-0.12
85-89	14,095	1.25	15,650	1.10	-0.15
90-94	4,180	1.24	4,673	1.14	-0.10
95 and over	821	0.90	982	0.91	0.01

TABLE 25

SUMMARY OF GROUP ANNUITY MORTALITY EXPERIENCE BY FEMALE INCOME  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1985		1986		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	\$533,280,138	1.32	\$583,426,273	1.20	-0.12
By Retirement Class					
Prior to NRD	\$215,001,197	1.38	\$221,276,819	1.26	-0.12
On/After NRD	163,946,147	1.28	203,634,711	1.18	-0.10
No Stated NRD	153,114,492	1.31	157,119,510	1.19	-0.12
Past NRD/No Payment	1,218,302	1.65	1,395,233	1.02	-0.63
By Benefit Class					
Life	\$351,447,405	1.30	\$387,006,082	1.19	-0.11
Life and Certain	82,979,552	1.24	84,768,770	1.16	-0.08
Modified Cash Refund	98,853,181	1.43	111,651,421	1.27	-0.16
By Survivor Class					
Single Life	\$497,616,457	1.30	\$540,964,271	1.19	-0.11
Joint Life	35,663,681	1.58	42,462,002	1.46	-0.12
By Years Since Retirement					
0-1	\$ 99,508,987	1.48	\$115,999,782	1.37	-0.11
2-5	182,899,420	1.54	198,842,855	1.34	-0.20
6-10	135,913,460	1.39	141,821,166	1.18	-0.21
11 +	114,958,271	1.15	126,762,470	1.11	-0.04
By Attained Age					
Under 55	\$ 7,071,025	2.30	\$ 7,651,114	2.19	-0.11
55-59	33,677,648	2.22	35,791,423	1.90	-0.32
60-64	100,363,680	1.71	107,961,748	1.66	-0.05
65-69	153,458,823	1.59	168,786,460	1.37	-0.22
70-74	119,725,450	1.41	130,383,351	1.24	-0.17
75-79	70,803,175	1.18	78,319,638	1.08	-0.10
80-84	32,975,778	1.08	37,099,496	1.01	-0.07
85-89	11,629,437	1.18	13,281,005	1.16	-0.02
90-94	3,008,300	1.30	3,471,969	1.16	-0.14
95 and over	566,822	0.88	680,069	0.89	0.01

## COMMITTEE ON ANNUITIES

Tables 26–29 display a comparison of results for the 1983–84 mortality study with those for the 1985–86 mortality study. The table format highlights total exposures and A/E mortality ratios summarized for the major data cells for each study, and the change in A/E ratios between the two study periods. The tables provide a quick overview of both studies and an indication of possible mortality trends.

TABLE 26  
COMPARISON OF 1985–86 WITH 1983–84 GROUP ANNUITY MORTALITY EXPERIENCE  
BY MALE LIVES  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1983-84		1985-86		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	1,512,482	1.20	1,731,564	1.19	- 0.01
By Retirement Class					
Prior to NRD	573,675	1.25	688,202	1.20	- 0.05
On/After NRD	543,688	1.15	591,127	1.14	- 0.01
No Stated NRD	391,879	1.23	448,796	1.25	0.02
Past NRD/No Payment	3,240	0.86	3,438	0.95	0.09
By Benefit Class					
Life	956,743	1.20	1,097,123	1.21	0.01
Life and Certain	300,487	1.21	322,644	1.16	- 0.05
Modified Cash Refund	255,251	1.20	311,797	1.14	- 0.06
By Survivor Class					
Single Life	1,222,884	1.20	1,347,303	1.19	- 0.01
Joint Life	289,597	1.20	384,261	1.18	- 0.02
By Years Since Retirement					
0-1	199,879	1.24	224,152	1.38	0.14
2-5	430,277	1.28	495,137	1.27	- 0.01
6-10	442,823	1.23	469,659	1.19	- 0.04
11+	439,502	1.15	542,616	1.14	- 0.01
By Attained Age					
Under 55	6,170	2.93	8,600	3.37	0.44
55-59	73,738	1.99	87,310	1.97	- 0.02
60-64	218,014	1.59	245,661	1.57	- 0.02
65-69	416,958	1.29	451,995	1.32	0.03
70-74	370,940	1.23	423,774	1.21	- 0.02
75-79	236,571	1.18	283,286	1.16	- 0.02
80-84	125,234	1.07	150,024	1.09	0.02
85-89	48,611	1.09	60,140	1.06	- 0.03
90-94	13,811	1.10	17,509	1.08	- 0.02
95 and over	2,364	1.01	3,264	0.92	- 0.09
Comparison of Female/ Male		0.57		0.58	0.01

TABLE 27  
 COMPARISON OF 1985-86 WITH 1983-84 GROUP ANNUITY MORTALITY EXPERIENCE  
 BY MALE INCOME  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1983-84		1985-86		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	\$3,989,717,228	1.12	\$5,152,178,263	1.10	-0.02
By Retirement Class					
Prior to NRD	\$1,572,646,039	1.11	\$2,127,360,576	1.08	-0.03
On/After NRD	1,262,542,377	1.09	1,569,485,762	1.05	-0.04
No Stated NRD	1,148,060,009	1.18	1,447,680,760	1.20	0.02
Past NRD/No Payment	6,468,803	0.79	7,651,165	0.79	0.00
By Benefit Class					
Life	\$2,566,026,090	1.12	\$3,377,527,615	1.12	0.00
Life and Certain	752,781,155	1.14	875,992,440	1.09	-0.05
Modified Cash Refund	670,909,983	1.07	898,658,208	1.04	-0.03
By Survivor Class					
Single Life	\$2,832,954,369	1.12	\$3,445,624,912	1.11	-0.01
Joint Life	1,156,762,859	1.09	1,706,553,351	1.07	-0.02
By Years Since Retirement					
0-1	\$ 793,289,015	1.08	\$1,009,580,601	1.16	0.08
2-5	1,337,958,908	1.17	1,803,461,862	1.13	-0.04
6-10	1,094,693,373	1.12	1,264,458,809	1.09	-0.03
11+	763,775,932	1.10	1,074,676,991	1.08	-0.02
By Attained Age					
Under 55	\$ 31,171,393	2.04	\$ 49,396,067	2.22	0.18
55-59	231,967,666	1.65	321,598,973	1.67	0.02
60-64	842,139,514	1.23	1,063,647,844	1.26	0.03
65-69	1,242,993,091	1.14	1,567,142,778	1.14	0.00
70-74	878,131,797	1.14	1,128,316,122	1.10	-0.04
75-79	464,268,103	1.10	622,586,753	1.07	-0.03
80-84	209,552,958	0.99	273,881,182	1.02	0.03
85-89	69,887,761	1.04	97,957,679	0.98	-0.06
90-94	16,923,445	1.10	23,829,024	1.10	0.00
95 and over	2,681,500	1.01	3,821,841	0.93	-0.08
Comparison of Female/ Male		0.59		0.61	0.02

TABLE 28

COMPARISON OF 1985-86 WITH 1983-84 GROUP ANNUITY MORTALITY EXPERIENCE  
BY FEMALE LIVES  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1983-84		1985-86		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	649,664	1.24	762,517	1.25	0.01
By Retirement Class					
Prior to NRD	222,472	1.39	271,691	1.34	-0.05
On/After NRD	247,283	1.20	286,337	1.23	0.03
No Stated NRD	178,353	1.20	202,781	1.22	0.02
Past NRD/No Payment	1,557	1.09	1,708	1.38	0.29
By Benefit Class					
Life	427,961	1.25	506,015	1.27	0.02
Life and Certain	104,114	1.22	113,052	1.18	-0.04
Modified Cash Refund	117,589	1.23	143,451	1.25	0.02
By Survivor Class					
Single Life	624,177	1.23	727,519	1.25	0.02
Joint Life	25,487	1.58	34,998	1.47	-0.11
By Years Since Retirement					
0-1	82,931	1.52	96,193	1.56	0.04
2-5	183,480	1.38	211,930	1.44	0.06
6-10	192,015	1.26	206,676	1.28	0.02
11+	191,237	1.17	247,718	1.17	0.00
By Attained Age					
Under 55	4,967	3.95	6,040	3.83	-0.12
55-59	30,088	2.51	33,694	2.33	-0.18
60-64	90,608	1.78	100,985	1.89	0.11
65-69	170,727	1.54	189,084	1.57	0.03
70-74	158,926	1.31	184,035	1.34	0.03
75-79	108,844	1.13	134,029	1.17	0.04
80-84	56,019	1.10	74,249	1.11	0.01
85-89	21,929	1.17	29,746	1.17	0.00
90-94	6,407	1.14	8,853	1.19	0.05
95 and over	1,149	0.92	1,803	0.91	-0.01

TABLE 29  
COMPARISON OF 1985-86 WITH 1983-84 GROUP ANNUITY MORTALITY EXPERIENCE  
BY FEMALE INCOME  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

	1983-84		1985-86		Change in A/E Ratios
	Exposure	A/E Ratio	Exposure	A/E Ratio	
Total	\$840,023,063	1.26	\$1,116,706,411	1.25	-0.01
By Retirement Class					
Prior to NRD	\$303,313,930	1.39	\$ 436,278,016	1.32	-0.07
On/After NRD	278,217,894	1.21	367,580,858	1.22	0.01
No Stated NRD	256,046,990	1.23	310,234,002	1.25	0.02
By Benefit Class					
Life	\$539,022,652	1.25	\$ 738,453,487	1.24	-0.01
Life and Certain	143,921,328	1.28	167,748,322	1.20	-0.08
Modified Cash Refund	157,079,083	1.26	210,504,602	1.34	0.08
By Survivor Class					
Single Life	\$791,352,948	1.25	\$1,038,580,728	1.24	-0.01
Joint Life	48,670,115	1.44	78,125,683	1.52	0.08
By Years Since Retirement					
0-1	\$165,004,636	1.36	\$ 215,508,769	1.42	0.06
2-5	281,069,498	1.42	381,742,275	1.43	0.01
6-10	231,440,213	1.22	277,734,626	1.28	0.06
11+	162,508,716	1.18	241,720,741	1.13	-0.05
By Attained Age					
Under 55	\$ 11,785,424	2.71	\$ 14,722,139	2.24	-0.47
55-59	52,022,071	2.24	69,469,071	2.05	-0.19
60-64	157,614,255	1.73	208,325,428	1.69	-0.04
65-69	251,833,246	1.49	322,245,283	1.48	-0.01
70-74	191,400,180	1.24	250,108,801	1.32	0.08
75-79	106,948,152	1.10	149,122,813	1.13	0.03
80-84	47,137,716	1.10	70,075,274	1.04	-0.06
85-89	16,355,631	1.18	24,910,442	1.17	-0.01
90-94	4,138,505	1.15	6,480,269	1.23	0.08
95 and over	787,883	0.93	1,246,891	0.89	-0.04

Tables 30-33 and Charts I-IV depict the overall A/E ratios by age group for each calendar year 1981-86. Also shown is the year-to-year improvement in mortality. This is determined by taking the ratio of A/E ratios from one year to the next. An arithmetic average of these ratios gives an indication of the average improvement in mortality from 1981 to 1986.

#### PRINCIPAL OBSERVATIONS

Comparing 1983-84 calendar-year data against 1985-86 calendar-year data did not reveal any distortions, major trends, or unreasonable results for total experience or experience by class. Males exhibited only slight mortality improvement over the two-year period for studies based on lives and income. Female data showed virtually no improvement in mortality from 1983-84 to 1985-86.

Both male and female exposures have increased significantly over the 1983-84 study, in terms of both number of lives and annual income. With annual income increasing at a greater pace, however, the result is higher average income per life. This could be the result of new retirements under existing contracts, or the addition of new contracts, to the data file.

The overall male mortality ratio based on number of lives improved by 0.01 (1985-86 A/E ratio of 1.19 versus 1983-84 A/E ratio of 1.20); the mortality ratio based on income improved by 0.02. The reason for the difference between the life and income ratios is that most of the mortality improvement occurred in the group comprising those who have previously retired early, and attained age group 70-74; these are the exposures with the highest average incomes.

The overall female mortality ratio based on number of lives deteriorated by 0.01 (1985-86 A/E ratio of 1.25 versus 1983-84 A/E ratio of 1.17); the mortality ratio based on income improved by 0.01. By and large, female mortality deteriorated; this is offset by the higher relative income exposure for single lives, which showed slight improvement in mortality.

Male A/E ratios were lower when based on income than on number of lives for almost every attained age group in every study. This feature of the data (also observed in the 1983-84 calendar-year study) would tend to support the notion that higher income (and presumably higher socioeconomic status) exhibits slightly better mortality. Female A/E ratios are virtually identical based on lives and income (for total exposure). Comparisons vary by age group.



TABLE 30  
 SUMMARY OF MORTALITY IMPROVEMENT FOR MALE LIVES  
 FOR CALENDAR-YEARS 1981 TO 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	A/E Ratio						Annual Improvement Factors					Arithmetic Average
	1986	1985	1984	1983	1982	1981	1986 to 1985	1985 to 1984	1984 to 1983	1983 to 1982	1982 to 1981	
Under 55 . . . . .	2.78	4.01	3.06	2.78	4.06	3.56	0.306	-0.311	-0.100	0.314	-0.139	0.014
55-59 . . . . .	1.91	2.03	1.92	2.07	2.12	2.22	0.059	-0.058	0.070	0.028	0.042	0.028
60-64 . . . . .	1.50	1.64	1.57	1.61	1.65	1.60	0.088	-0.047	0.024	0.028	-0.032	0.012
65-69 . . . . .	1.25	1.38	1.28	1.31	1.32	1.32	0.099	-0.085	0.029	0.008	0.000	0.010
70-74 . . . . .	1.12	1.30	1.23	1.24	1.25	1.26	0.137	-0.058	0.007	0.008	0.008	0.020
75-79 . . . . .	1.09	1.24	1.16	1.20	1.16	1.17	0.123	-0.064	0.032	-0.042	0.013	0.013
80-84 . . . . .	1.05	1.14	1.07	1.06	1.06	1.11	0.077	-0.061	-0.007	-0.001	0.045	0.011
85-89 . . . . .	0.98	1.15	1.09	1.08	1.07	1.07	0.149	-0.058	-0.003	-0.010	-0.007	0.014
90-94 . . . . .	1.00	1.17	1.11	1.08	1.03	1.09	0.146	-0.059	-0.024	-0.050	0.050	0.013
95 and over . . . . .	0.80	1.06	1.01	1.01	0.82	0.96	0.244	-0.047	0.002	-0.231	0.142	0.022
Total . . . . .	1.11	1.26	1.19	1.21	1.20	1.22	0.120	-0.062	0.014	-0.008	0.015	0.016

TABLE 31  
SUMMARY OF MORTALITY IMPROVEMENT FOR MALE INCOME  
CALENDAR-YEARS 1981 TO 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	A/E Ratio						Annual Improvement Factors					Arithmetic Average
	1986	1985	1984	1983	1982	1981	1986 to 1985	1985 to 1984	1984 to 1983	1983 to 1982	1982 to 1981	
Under 55.....	1.79	2.74	2.23	1.81	2.27	2.25	0.347	-0.229	-0.233	0.202	-0.009	0.015
55-59.....	1.66	1.68	1.58	1.73	1.79	1.95	0.012	-0.066	0.090	0.033	0.079	0.030
60-64.....	1.21	1.31	1.20	1.27	1.35	1.36	0.073	-0.091	0.057	0.063	0.006	0.022
65-69.....	1.09	1.19	1.11	1.19	1.16	1.22	0.087	-0.078	0.070	-0.024	0.048	0.021
70-74.....	1.02	1.19	1.15	1.14	1.13	1.21	0.143	-0.035	-0.014	-0.001	0.063	0.031
75-79.....	1.00	1.14	1.09	1.12	1.09	1.15	0.115	-0.044	0.028	-0.025	0.049	0.025
80-84.....	1.02	1.03	0.98	1.01	1.03	1.09	0.007	-0.054	0.038	0.012	0.055	0.012
85-89.....	0.92	1.04	1.03	1.04	1.09	1.07	0.123	-0.012	0.009	0.049	-0.025	0.029
90-94.....	0.99	1.21	1.13	1.06	1.09	1.06	0.176	-0.070	-0.058	0.019	-0.023	0.009
95 and over....	0.77	1.09	0.92	1.13	0.72	1.07	0.292	-0.179	0.180	-0.572	0.330	0.010
Total.....	1.05	1.16	1.10	1.14	1.13	1.19	0.100	-0.053	0.029	-0.003	0.045	0.024

TABLE 32  
SUMMARY OF MORTALITY IMPROVEMENT FOR FEMALE LIVES  
FOR CALENDAR-YEARS 1981 TO 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	A/E Ratio						Annual Improvement Factors					Arithmetic Average
	1986	1985	1984	1983	1982	1981	1986 to 1985	1985 to 1984	1984 to 1983	1983 to 1982	1982 to 1981	
Under 55 . . . . .	4.00	3.65	4.91	2.81	2.74	4.87	-0.095	0.256	-0.750	-0.023	0.437	-0.035
55-59 . . . . .	2.04	2.61	2.46	2.58	2.38	2.71	0.219	-0.060	0.045	-0.085	0.122	0.048
60-64 . . . . .	1.73	2.04	1.68	1.91	1.73	1.92	0.153	-0.219	0.124	-0.103	0.099	0.011
65-69 . . . . .	1.49	1.65	1.53	1.56	1.46	1.53	0.096	-0.074	0.017	-0.070	0.046	0.003
70-74 . . . . .	1.29	1.40	1.34	1.29	1.15	1.26	0.078	-0.046	-0.039	-0.121	0.093	-0.007
75-79 . . . . .	1.11	1.23	1.15	1.10	1.06	1.05	0.095	-0.064	-0.046	-0.039	-0.012	-0.013
80-84 . . . . .	1.05	1.17	1.09	1.12	1.02	1.04	0.103	-0.082	0.028	-0.099	0.020	-0.006
85-89 . . . . .	1.10	1.25	1.19	1.15	1.08	1.05	0.118	-0.049	-0.036	-0.063	-0.026	-0.011
90-94 . . . . .	1.14	1.24	1.20	1.06	0.99	1.10	0.082	-0.032	-0.133	-0.070	0.095	-0.012
95 and over . . . . .	0.91	0.90	0.87	0.98	0.79	0.95	-0.020	-0.034	0.116	-0.242	0.170	-0.002
Total . . . . .	1.19	1.32	1.24	1.24	1.14	1.20	0.102	-0.062	-0.006	-0.085	0.046	-0.001

TABLE 33

SUMMARY OF MORTALITY IMPROVEMENT FOR FEMALE INCOME  
FOR CALENDAR-YEARS 1981 TO 1986  
EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

Attained Age	A/E Ratio						Annual Improvement Factors					Arithmetic Average
	1986	1985	1984	1983	1982	1981	1986 to 1985	1985 to 1984	1984 to 1983	1983 to 1982	1982 to 1981	
Under 55 .....	2.19	2.30	3.49	1.75	2.73	5.80	0.046	-0.341	-0.988	-0.358	0.529	0.057
55-59 .....	1.90	2.22	1.86	2.70	2.01	2.70	0.143	-0.190	0.309	-0.344	0.257	0.035
60-64 .....	1.66	1.71	1.69	1.78	1.63	2.17	0.027	-0.009	0.049	-0.090	0.248	0.045
65-69 .....	1.37	1.59	1.57	1.38	1.44	1.72	0.139	0.011	-0.136	0.035	0.167	0.039
70-74 .....	1.24	1.41	1.25	1.23	1.19	1.35	0.120	-0.133	0.012	-0.036	0.123	0.012
75-79 .....	1.08	1.18	1.12	1.09	1.04	1.06	0.081	0.057	0.025	-0.051	0.026	-0.005
80-84 .....	1.01	1.08	1.08	1.13	1.01	1.11	0.060	0.001	0.043	-0.120	0.089	0.015
85-89 .....	1.16	1.18	1.23	1.12	1.09	1.17	0.019	0.037	-0.101	-0.029	0.073	0.000
90-94 .....	1.16	1.30	1.17	1.14	1.13	1.13	0.110	0.117	-0.023	-0.011	0.002	-0.008
95 and over....	0.89	0.88	0.79	1.12	0.78	0.83	-0.009	0.122	0.295	-0.425	0.057	-0.041
Total .....	1.20	1.32	1.26	1.24	1.18	1.34	0.090	-0.041	-0.016	-0.054	0.122	0.020

CHART I  
 SUMMARY OF MORTALITY IMPROVEMENT FOR MALE LIVES  
 FOR CALENDAR-YEARS 1981 TO 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

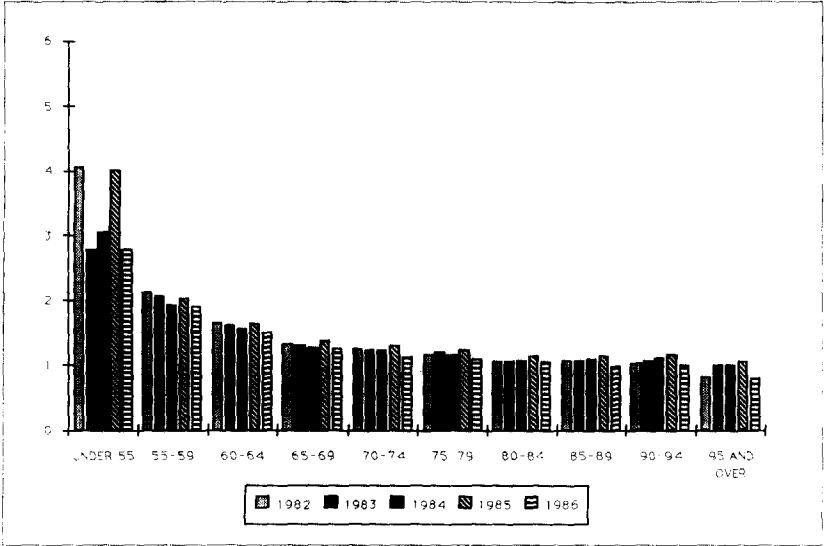


CHART II  
 SUMMARY OF MORTALITY IMPROVEMENT FOR MALE INCOME  
 FOR CALENDAR-YEARS 1981 TO 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

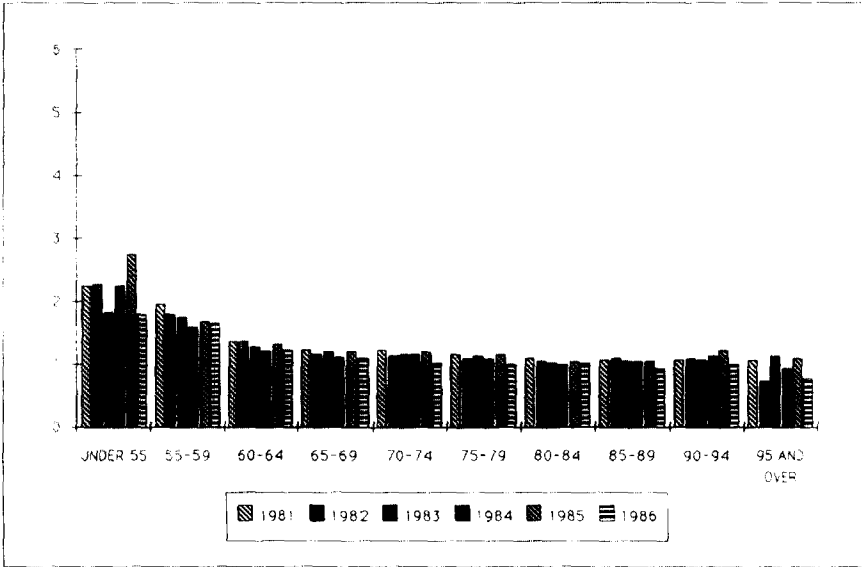


CHART III  
 SUMMARY OF MORTALITY IMPROVEMENT FOR FEMALE LIVES  
 FOR CALENDAR-YEARS 1981 TO 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY

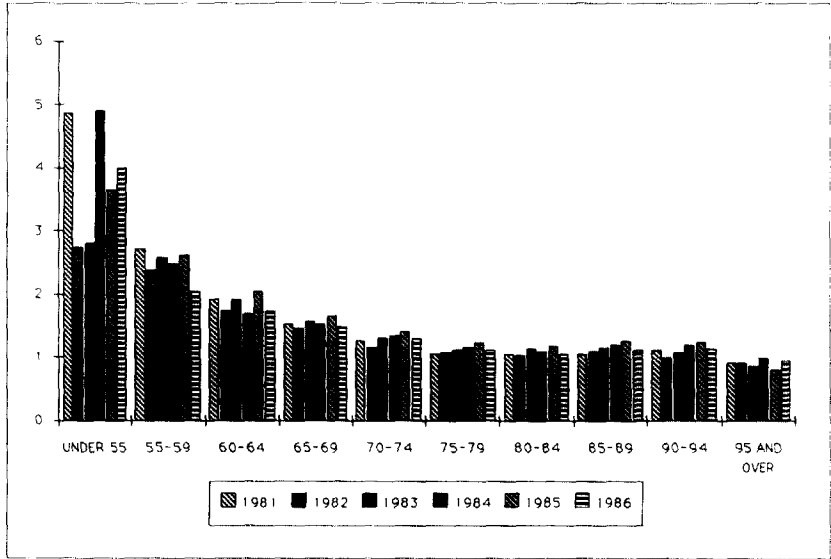
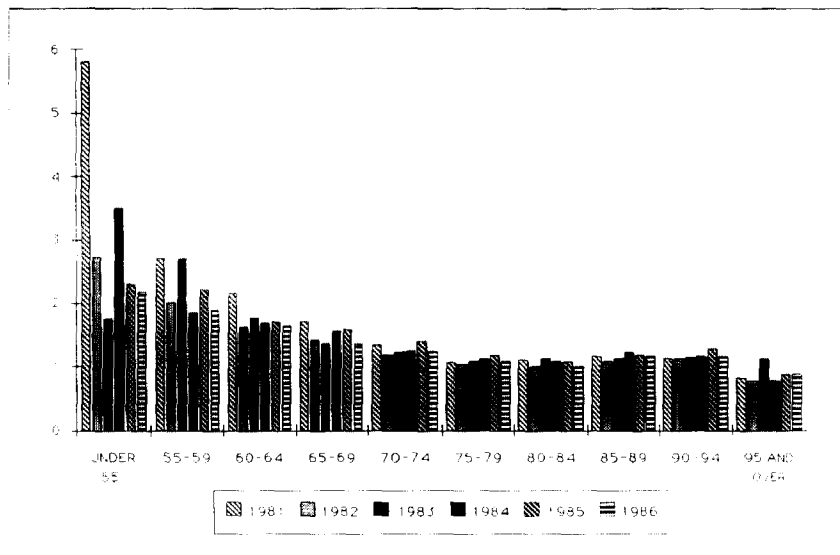


CHART IV  
 SUMMARY OF MORTALITY IMPROVEMENT FOR FEMALE INCOME  
 FOR CALENDAR-YEARS 1981 TO 1986  
 EXPECTED MORTALITY BASIS—1983 GROUP ANNUITY MORTALITY





Almost 40 percent of male and female exposures is in the "prior to NRD" retirement class. The mixture of exposure varies with attained age: The percentage of exposure in the "prior to NRD" class rapidly decreases with increasing attained ages. The pattern of exposure indicates greater availability and higher utilization of early retirement options for the current generation of retirement.

The "on/after NRD" retirement class continues to exhibit marginally better mortality over the "prior to NRD" and "no stated NRD" retirement classes; however, the "prior to NRD" class has shown some relative improvement for the 1985-86 study period.

When the data are analyzed by benefit class, about 65 percent of exposure arises from life-only annuities, and the remainder is certain and life or refund annuities. The split generally holds for both males and females and does not vary by attained age.

Mortality ratios for life-only annuities are somewhat higher than those for certain and life or refund annuities. Mortality ratios by attained age group exhibit some variability: A/E ratios for life-only annuities exceed A/E ratios for certain and life annuities at some attained age cells; the reverse is true at other attained age cells.

Exposure for annuitants selecting joint life forms of benefits is still a relatively small percentage of the total study exposure. The 1985-86 data show a large increase in the selection of joint life benefits by new retirees for both male and female annuitants. Even with increased activity, less than 50 percent of males elect joint life benefits and less than 10 percent of females elect joint life benefit forms.

Overall, there is not much difference between mortality levels for single life and joint life benefit forms. There are differences by attained age (which were also observed in the 1983-84 study): Male joint life benefit forms have lower mortality ratios for ages 65 and over and have higher mortality ratios for ages 64 and under. The higher ratios at low attained ages are probably due to a small amount of antiselection in those choosing a survivor form of benefit.

When exposure is analyzed by duration (measured by years since retirement), there appears to be some evidence of select period of adverse mortality. Mortality ratios in duration 0-1 have worsened significantly since the 1983-84 study and are higher than mortality ratios at the higher durations.

Results of comparing the absolute level of female mortality to that of male mortality are similar to those of the 1983-84 study: females experience about

50 to 60 percent of the mortality rates of males for attained ages under 85, with the percentages slowly increasing at higher attained ages.

The effect of including both guaranteed and nonguaranteed payments in the study is a somewhat worsened overall mortality ratio compared to that covering guaranteed payments only.

Mortality has improved in three of the five years from 1981 to 1986 for male lives and income, and in two of the five years for female lives and income. Overall, mortality has improved by an average of 1.7 percent per year based on male lives and 2.3 percent per year based on male income. Mortality has improved by 0.2 percent per year based on female lives and by 2.2 percent per year based on female income. Assuming mortality improvement is expected to occur, it is also expected that there would be year-by-year variance. Such variance might be due to a lag in reporting or due to acceptable statistical differences given limited exposure. However, over the last five years, mortality has improved.

#### CONTRIBUTING COMPANIES

The following companies have contributed experience for the investigation covered by this report.

Aetna Life Insurance Company

CIGNA

John Hancock Mutual Life Insurance Company

Pacific Mutual Life Insurance Company

Principal Mutual Life Insurance Company

Prudential Insurance Company of America

Sun Life Assurance Company of Canada

Travelers Insurance Company