

**II. MORTALITY UNDER STANDARD INDIVIDUALLY  
UNDERWRITTEN LIFE INSURANCE  
BETWEEN 1989 AND 1990 ANNIVERSARIES**

**ABSTRACT**

This study is the latest in continuing annual reports on intercompany mortality experience under standard individually underwritten life insurance. Nineteen companies contributed their data to this study, as listed in Appendix A. These are the same 19 companies that contributed to the 1988-89 study. However, due to changes in the list of contributing companies from year to year, direct comparisons with previous studies are affected to a minor degree.

The ratios in the report of actual to expected mortality are based on the 1975-80 Basic Tables. For purposes of comparison with previous reports, overall results are also given based on the 1965-70 Basic Table in Tables B, 1, and 2 for select experience (policy years 1-15) and in Tables B and 22 for ultimate experience (policy years 16 and over).

The overall mortality ratio in Tables B, 1, 2, and 5 for select experience between 1989 and 1990 anniversaries is 80.7%, down 1.9% from the 1988-89 study and continuing the ongoing trend. The improvement occurs for medical and paramedical business, although the ratio increased for nonmedical business.

The overall mortality ratio in Tables 7, 8, and 14 for select experience between 1985 and 1990 anniversaries is 83.5%, down 2.2% from the 1984-89 study. The improvement occurs for both males, down 1.9% to 83.4%, and females, down 3.2% to 84.3%.

The overall ratio of smoker to nonsmoker mortality in Tables 16 and 17 in policy years 1-10 for experience between 1989 and 1990 anniversaries is 2.62, up from 2.07 in the prior one-year study. For experience between 1985 and 1990 anniversaries, the overall ratio in Tables 18 and 19 is 2.25, up from 2.16 in the prior five-year study. (Both these increases are attributable largely to unusually high actual deaths among smokers at issue ages 40-49 in the medical experience from the 1989-90 study.)

The overall mortality ratio in Tables B and 22 for ultimate experience between 1989 and 1990 anniversaries is 84.0%, down 0.8% from the 1988-89 study. The comparable mortality ratios using expected deaths based on the 1980 CSO tables and the 1979-81 U.S. Population Tables are 63.9% and 64.1%, respectively.

**SPECIAL NOTES**

1. Tables 7-15 and 18-21 are five-year experience tables. The normal expectation with respect to these is that they represent the current year's experience and the prior four individual years', with perhaps a few minor adjustments to prior year's files. However, for this study a significant number of adjust-

ments and additions have been made to prior years' data as part of the data validations and cleanup of the current year's data.

2. A very large death claim has been included in the 1989-90 study. This has little effect in the overall study, but must be considered in the subdivisions of the data. It is especially significant in the cell in which it falls: Male, Medical, Smoker, Ages at Issue 45-49, Policy Year 1.

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## INTRODUCTION

This report covers the intercompany (U.S.) mortality experience by amount of life insurance under standard individually underwritten issues between 1989 and 1990 anniversaries. The report also combines experience between 1985 and 1990 anniversaries in order to provide a larger volume of data, so that broader comparisons of results can be made, particularly for males-females, for smokers-nonsmokers, and for medical-paramedical-non-medical issues.

The report is divided into four primary sections:

- I. Select experience (first 15 policy years) between 1989 and 1990 anniversaries for issues of 1975-1989 (Tables 1-6).
- II. Select experience (first 15 policy years) between 1985 and 1990 anniversaries for issues of 1975-1989 (Tables 7-15).
- III. Smoker-nonsmoker experience (first 10 policy years) between 1989 and 1990 anniversaries and between 1985 and 1990 anniversaries for issues of 1980-1989 (Tables 16-21).
- IV. Ultimate experience (policy years 16 and over) between 1989 and 1990 anniversaries and between 1985 and 1990 anniversaries for issues of 1974 and prior (Tables 22-25).

Each section subdivides experience by insurance issued subject to a medical examination (medical), insurance issued subject to a paramedical examination (paramedical), and insurance issued without a paramedical or medical examination (nonmedical).

## INDEX OF PRIMARY TABLES

Table	Exposure Period	Policy Years*	Medical, Paramedical, or Nonmedical	Male or Female	Smoker/ Nonsmoker	Mortality Ratios by
1 .....	1989-90	1-15	Combined	Combined	Combined	Issue age
2 .....	1989-90	1-15	Combined	Combined	Combined	Policy year
3 .....	1989-90	1-15	Separately	Combined	Combined	Issue age
4 .....	1989-90	1-15	Separately	Combined	Combined	Policy year
5 .....	1989-90	1-15	Separately	Combined	Combined	Issue age and policy year
6 .....	1989-90	1-15	Separately	Combined	Combined	Issue age and policy year
7 .....	1985-90	1-15	Combined	Separately	Combined	Issue age
8 .....	1985-90	1-15	Combined	Separately	Combined	Policy year
9 .....	1985-90	1-15	Separately	Separately	Combined	Issue age
10 .....	1985-90	1-15	Separately	Separately	Combined	Policy year
11 .....	1985-90	1-15	Medical	Separately	Combined	Issue age and policy year
12 .....	1985-90	1-15	Paramedical	Separately	Combined	Issue age and policy year
13 .....	1985-90	1-15	Nonmedical	Separately	Combined	Issue age and policy year
14 .....	1985-90	1-15	Combined	Separately	Combined	Issue age and policy year
15 .....	1985-90	1-15	Separately	Separately	Combined	Issue age and policy year
16 .....	1989-90	1-10	Separately	Combined	Separately	Issue age
17 .....	1989-90	1-10	Separately	Combined	Separately	Policy year
18 .....	1985-90	1-10	Separately	Combined	Separately	Issue age
19 .....	1985-90	1-10	Separately	Combined	Separately	Policy year
20 .....	1985-90	1-10	Combined	Separately	Separately	Issue age
21 .....	1985-90	1-10	Combined	Separately	Separately	Policy year
22 .....	1989-90	16 and over	Combined	Combined	Combined	Attained age
23 .....	1985-90	16 and over	Combined	Combined	Combined	Attained age
24 .....	1985-90	16 and over	Separately	Combined	Combined	Attained age
25 .....	1985-90	16 and over	Combined	Separately	Combined	Attained age

Appendix A - Names of the contributing companies and percentage of total 1989-90 exposures contributed by each company

\*Select (1-15); smoker-nonsmoker (1-10); ultimate (16 and over).

Most of the tables in this report show actual amounts of death claims (to the nearest \$1,000) and mortality ratios of actual-to-expected death claims based on the 1975-80 Basic Tables for Male and Female Lives. Tables B, 1, 2, and 22 also show mortality ratios based on the 1965-70 Basic Tables. In addition, Tables 1, 2, 7, 8, and 16-22 show amounts exposed to risk (to the nearest \$1,000,000), and Tables 1 and 2 show expected deaths (to the nearest \$1,000).

The 1989-90 select and ultimate experience is derived from the contributions of the same 19 companies that contributed to the 1988-89 study. The 1985-90 select and ultimate experience is derived from the contributions of 23 companies, 18 of which contributed data for the entire 1985-90 period. Note that 17 of these 18 companies are listed in the reports as having contributed to the underlying one-year studies, but one more company was able to contribute data retrospectively for inclusion in the

current five-year study. The 1989-90 smoker-nonsmoker experience is derived from the contributions of 17 companies, and the 1985-90 smoker-nonsmoker data are derived from the contributions of 18 companies. Appendix A gives the names and proportionate contributions of companies that contributed 1989-90 experience. Appendices B, C, and D, which are not published here but can be obtained from the Society Research Department, contain detailed medical, paramedical, and nonmedical experience, respectively, by ages at issue for each year of issue, for males and females separately, as well as data in smoker and nonsmoker categories.

The following summary tables show some interesting trends. Table A shows the change in proportions of policies issued by type of underwriting and reflects the substantially decreased use of medical examinations and increased use of nonmedicals since 1980. However, there is a reversal of this trend for 1987-1989 issues, indicating that there may be more medicals and paramedicals used in connection with an increased use of blood testing.

TABLE A  
EXPOSURES FOR POLICY YEAR 1  
AS PERCENTAGE OF TOTAL EXPOSURES

Year of Issue	Medical	Paramedical	Nonmedical
1977.....	34.7%	28.9%	36.4%
1978 .....	35.1	28.5	36.4
1979 .....	35.1	30.5	34.4
1980 .....	38.2	32.5	29.3
1981 .....	33.1	30.6	36.3
1982 .....	29.2	25.1	45.7
1983 .....	24.7	23.5	51.8
1984 .....	22.5	25.3	52.2
1985 .....	20.8	27.1	52.1
1986 .....	15.7	27.3	57.0
1987 .....	17.1	30.9	52.0
1988 .....	17.2	36.1	46.7
1989 .....	19.0	37.2	43.8

Table B shows mortality ratios by exposure years since the introduction of the 1965-70 Basic Tables. The decrease in the ratios are a continuation of the trend that has continued almost without exception since these annual studies were started.

TABLE B  
 AGGREGATE MORTALITY RATIOS BASED ON 1965-70 SELECT BASIC TABLES  
 (NUMBERS IN PARENTHESIS ARE MORTALITY RATIOS  
 BASED ON THE 1975-80 BASIC TABLES)

Exposure Year	Policy Years 1-15				Policy Years 16 and Over
	Medical	Paramedical	Nonmedical	Combined	
1973-74.....	88.0%	84.1%	99.1%	89.9%	93.4%
1974-75.....	85.1	85.5	94.9	87.8	87.1
1975-76.....	80.9	81.4	88.5	82.3	85.0
1976-77.....	75.5	78.0	87.9	77.9	82.0
1977-78.....	75.0	80.5	85.9	77.4	80.5
1978-79.....	68.7	74.5	84.9	72.1	77.0
1979-80.....	69.8	80.3	82.9	73.3	77.1
1980-81.....	69.5	70.1	79.8	71.0	75.2
1981-82.....	67.8	73.2	79.2	70.7	72.8
1982-83.....	68.0	69.9	74.2	69.6	73.2
1983-84.....	68.6(93.6)	68.8(92.2)	70.8(89.6)	69.1(92.4)	71.2(91.8)
1984-85.....	66.2(90.5)	69.9(94.3)	72.4(92.5)	68.5(91.9)	71.0(91.1)
1985-86.....	61.2(83.7)	67.9(91.8)	72.0(92.4)	65.5(88.0)	70.0(89.8)
1986-87.....	57.8(79.1)	68.0(91.9)	71.5(92.0)	64.2(86.3)	71.0(90.8)
1987-88.....	61.0(83.5)	64.3(87.2)	67.2(86.5)	63.6(85.6)	67.5(86.3)
1988-89.....	60.1(82.3)	59.5(80.9)	65.3(85.0)	61.3(82.6)	66.6(84.8)
1989-90.....	56.9(78.0)	58.4(79.3)	66.4(86.6)	59.8(80.7)	66.2(84.0)

Table C shows the proportions of medical, paramedical, and nonmedical exposures in policy year 1 and and policy years 1-15 by issue age groups. This indicates that the use of nonmedical predominates at issue ages under 30 and that medicals still account for about half of the exposures (which are based on amount of insurance) at issue ages 50 and over.

TABLE C  
 EXPOSURES AS PERCENTAGE OF TOTAL EXPOSURES FOR 1989-90 EXPERIENCE

Ages at Issue	Policy Year 1			Policy Years 1-15		
	Medical	Paramedical	Nonmedical	Medical	Paramedical	Nonmedical
0-9.....	3.0%	1.5%	95.5%	3.9%	1.8%	94.3%
10-19.....	3.2	4.9	92.0	4.3	4.4	91.3
20-29.....	4.4	17.7	77.9	6.1	14.4	79.5
30-39.....	13.7	42.4	44.0	17.1	36.8	46.1
40-49.....	30.6	52.2	17.2	32.5	47.8	19.7
50-59.....	47.1	43.2	9.7	46.7	43.5	9.9
60-69.....	58.1	35.1	6.8	56.4	37.6	6.0
70 and over.....	64.7	29.5	5.8	65.0	29.8	5.3
All Ages.....	19.0%	37.2%	43.8%	20.5%	32.2%	47.3%

It would be desirable for the comparisons of medical, paramedical, and nonmedical experience to be based on strictly comparable policies, but such comparisons are not possible. Medically underwritten business generally includes larger amounts of insurance issued to persons at higher socioeconomic levels than nonmedical and paramedical business. However, medical business also includes policies issued to individuals within nonmedical or paramedical amount limits who were not acceptable on these bases because of medical histories. Similarly, paramedical policies include persons not acceptable on a nonmedical basis. In addition, there are considerable variations in amount limits and proportions of medical, nonmedical, and paramedical policies among contributing companies. In this comparison and throughout this report, the difference in the mix of companies from that in previous studies may account for some of the differences in the 1989-90 and 1985-90 mortality ratios.

Note also that some of the more recent nonmedical issues are likely based on applications with limited medical history even though such simplified underwritten cases are ordinarily excluded from this study. In addition, nonmedical issues over age 50 often arise from business issued under pension trust and salary allotment plans. So-called policyholders' nonmedical, issued on the basis of a medical examination with the previous 6 or 12 months, is also included in nonmedical issues for some companies.

#### 1. 1989-90 SELECT EXPERIENCE (MALES AND FEMALES COMBINED)

The experience between 1989 and 1990 anniversaries during the first 15 policy years presented in Tables 1-6 represents exposures of \$912 billion and actual deaths of \$1,342 million. For the 1988-89 experience, these amounts were \$891 billion and \$1,299 million, respectively. As previously mentioned, the same 19 companies contributed data for both 1988-89 and 1989-90.

The experience for the first 15 policy years is compared by issue-age group in Table 1 and by policy year in Table 2. Separate data for medical, paramedical, and nonmedical are shown by issue age group in Table 3 and by policy year in Table 4. Tables 5 and 6 present the data by issue-age and policy-year groupings for each underwriting classification.

TABLE 1

1989-90 EXPERIENCE BY ISSUE AGE  
 MALE AND FEMALE LIVES COMBINED; MEDICAL, PARAMEDICAL, NONMEDICAL COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1965-70 AND 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Exposure	1975-80		Mortality Ratio	
		Actual Deaths	Expected Deaths	1975-80 Basic Tables	1965-70 Basic Tables
0-9 .....	\$ 47,696	\$ 12,504	\$ 17,375	72.0%	35.6%
10-14 .....	13,499	6,141	8,471	72.5	72.0
15-19 .....	21,851	15,912	18,072	88.0	87.1
20-24 .....	55,594	31,555	36,162	87.3	74.6
25-29 .....	127,656	77,029	89,613	86.0	72.7
30-34 .....	178,095	111,202	164,333	67.7	52.3
35-39 .....	171,015	158,478	227,307	69.7	54.2
40-44 .....	123,104	172,048	237,374	72.5	52.9
45-49 .....	75,025	191,956	227,176	84.5	63.3
50-54 .....	45,821	172,356	197,214	87.4	58.5
55-59 .....	29,468	177,176	194,085	91.3	68.6
60-64 .....	15,579	121,655	136,181	89.3	61.1
65-69 .....	5,793	61,254	79,155	77.4	59.2
70 and over.....	2,007	32,820	31,067	105.6	75.6
Total .....	\$912,209	\$1,342,093	\$1,663,592	80.7%	59.8%

TABLE 2

1989-90 EXPERIENCE BY POLICY YEAR  
 MALE AND FEMALE LIVES COMBINED; MEDICAL, PARAMEDICAL, NONMEDICAL COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1965-70 AND 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Policy Year	Exposure	Actual Deaths	Expected Deaths	Mortality Ratio	
				1975-80 Basic Tables	1965-70 Basic Tables
1 .....	\$187,341	\$ 141,829	\$ 166,498	85.2%	60.6%
2 .....	151,697	110,259	177,497	62.1	44.7
3 .....	121,379	140,224	186,282	75.3	54.7
4 .....	97,884	131,151	169,943	77.2	56.9
5 .....	72,742	115,511	146,140	79.0	60.6
6 .....	63,066	124,939	143,572	87.0	65.1
7 .....	58,820	112,900	148,179	76.2	56.4
8 .....	40,266	86,277	106,680	80.9	60.0
9 .....	28,612	77,238	80,733	95.7	71.8
10 .....	21,898	54,946	67,379	81.5	61.2
11 .....	17,914	51,947	60,471	85.9	65.8
12 .....	15,356	66,497	56,264	118.2	91.0
13 .....	13,431	46,763	53,300	87.7	67.6
14 .....	11,618	43,103	51,567	83.6	64.6
15 .....	10,178	38,503	49,079	78.5	60.7
Total .....	\$912,209	\$1,342,093	\$1,663,592	80.7%	59.8%

TABLE 3  
 MEDICAL, PARAMEDICAL, NONMEDICAL 1989-90 EXPERIENCE BY ISSUE AGE  
 MALE AND FEMALE LIVES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issuc	Medical		Paramedical		Nonmedical	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
0-9 .....	\$ 377	52.0%	\$ 0	0.0%	\$ 12,126	74.2%
10-14 .....	350	70.6	50	14.7	5,741	75.2
15-19 .....	475	62.2	719	82.4	14,717	89.5
20-24 .....	1,286	71.1	2,043	60.4	28,226	91.1
25-29 .....	4,695	60.9	11,895	73.9	60,439	91.9
30-34 .....	13,320	49.1	31,375	61.1	66,505	77.5
35-39 .....	43,018	74.3	58,262	61.7	57,197	76.2
40-44 .....	48,992	60.4	77,171	71.8	45,884	93.9
45-49 .....	85,418	91.4	74,401	75.1	32,136	92.7
50-54 .....	83,065	83.1	71,173	89.4	18,117	102.3
55-59 .....	88,161	85.4	72,137	94.5	16,876	116.5
60-64 .....	62,423	79.5	52,807	105.0	6,424	87.8
65-69 .....	35,265	68.8	22,194	90.7	3,777	109.7
70 and over.....	20,619	98.5	11,427	130.4	709	52.1
Total .....	\$487,471	78.0%	\$485,659	79.3%	\$368,882	86.6%

TABLE 4  
 MEDICAL, PARAMEDICAL, NONMEDICAL 1989-90 EXPERIENCE BY POLICY YEAR  
 MALE AND FEMALE LIVES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Policy Year	Medical		Paramedical		Nonmedical	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
1 .....	\$ 60,133	124.2%	\$39,914	59.6%	\$ 41,780	81.7%
2 .....	23,257	43.1	50,531	67.9	36,470	74.3
3 .....	38,823	65.1	55,633	73.7	45,767	89.5
4 .....	36,903	67.0	53,943	80.9	40,304	83.6
5 .....	29,652	64.5	46,588	80.1	39,191	93.4
6 .....	38,532	84.4	49,345	88.2	37,061	88.2
7 .....	33,227	64.4	42,344	79.8	37,328	85.8
8 .....	29,367	72.4	32,052	86.6	24,856	85.4
9 .....	35,635	98.0	26,891	94.4	14,711	92.5
10 .....	24,721	72.5	21,230	89.8	8,995	93.3
11 .....	24,206	76.0	19,344	100.4	8,395	89.7
12 .....	42,179	137.3	15,560	95.9	8,758	94.0
13 .....	26,126	86.7	12,661	85.6	7,975	95.2
14 .....	23,322	76.9	11,305	88.6	8,474	100.0
15 .....	21,382	70.1	8,310	83.9	8,810	101.7
Total .....	\$487,471	78.0%	\$485,659	79.3%	\$368,882	86.6%



Note that the totals of the actual deaths as classified by underwriting basis in Tables 3 and 4 are very nearly equal to the total actual deaths in Tables 1 and 2. The difference results from business not identified as either medical, paramedical, or nonmedical. Subtotals for the business that has been classified by underwriting basis are not shown.

The overall mortality ratio for policy years 1-15 for experience between 1989 and 1990 anniversaries based on the 1975-80 Basic Tables is 80.7%. The comparable ratio from the 1988-89 study was 82.6%. The mortality ratios by underwriting basis in the current one-year study are 78.0% for medical, 79.3% for paramedical, and 86.6% for nonmedical. The comparable ratios from the prior one-year study are 82.3%, 80.9%, and 85.0%, respectively. Thus, improvement occurred for medical and paramedical, but not for nonmedical issues. These aggregate ratios by underwriting basis are not directly comparable because of the different distributions by issue age.

Factors contributing to improvement in mortality in recent years are likely to include smaller proportions of smokers as the trend towards nonsmoking continues in the U.S. and as the use of laboratory testing to screen applicants for insurance increases.

### ***By Issue Age (Table 1 and 3)***

The overall select mortality ratio of 80.7% is down from 82.6% in the prior one-year study. This improvement is shared by all issue age groups except 0-9, 25-29, 55-59, 60-64, and 70 and over. Relative to the 1975-80 Basic Tables, favorable mortality occurs in all issue age groups except 70 and over.

Overall nonmedical mortality is 86.6% of expected, as noted above. Non-medical issues constitute the vast bulk of business written at issue ages through 29, almost half of the business written at issue ages 30-39 and somewhat less than one-fifth of the business written at issue ages 40-49. Mortality ratios more favorable than expected occur for all of these issue ages, presumably because much of the medical and paramedical issues were within nonmedical amount limits but required examination because of the medical history.

Overall medical and paramedical mortality are 78.0% and 79.3% of expected, respectively, as noted above. Medical and paramedical issues together represent more than half of the business written at issue ages 30-39 and more than 90% of the business written at issue ages 50 and above. At issue ages 50 and over medical mortality is consistently more favorable than paramedical.

*Policy Year (Tables 2 and 4)*

The mortality ratios by policy year are lower in the first eight years and higher in the remaining seven years of the select period. This pattern, in general, holds for medical, paramedical, and nonmedical business. The cause of this pattern may be antiselection due to replacement of policies issued prior to the introduction of interest-sensitive products and nonsmoker rates in the early 1980s.

*By Issue Age and Policy Year (Tables 5 and 6)*

In Table 5, actual deaths and mortality ratios are given by underwriting basis separately for six issue-age groups, each subdivided into four policy-year groups. This breakdown provides an opportunity to examine the separate medical, paramedical, and nonmedical data in more detail than that provided by issue age for all policy years combined in Table 3 and by policy year for all issue ages combined in Table 4.

Table 6 shows the ratios of mortality ratios: paramedical to medical, nonmedical to paramedical, and nonmedical to medical. Each of these would be expected to exceed 1.00 because in each case the ratio is that of the less exacting underwriting requirement to the more exacting. The exceptions to this rule tend to occur more generally for the issue-age groups for which the comparisons are distorted by small amounts of data as well as in the younger issue-age groups in which some distortion was introduced by the requirement at times of a medical or paramedical exam for some history of an impairment.

## II. 1985-90 SELECT EXPERIENCE (INCLUDING SEX-DISTINCT DATA)

The experience between 1985 and 1990 anniversaries during the first 15 policy years is presented in Tables 7-15 in the same format as that presented for the 1989-90 experience in Tables 1-6 (Tables 11-14 correspond to Table 5), except that data for males and females are presented separately as well as combined.

This experience includes exposures of \$4.1 trillion and actual deaths of \$6.0 billion. Corresponding 1983-88 figures were \$3.9 trillion and \$5.7 billion, respectively. As previously mentioned, 23 companies contributed to the five-year study.

The overall mortality ratio for policy years 1-15 for experience between 1985 and 1990 anniversaries is 83.5%. The comparable ratio from the 1984-89 study was 85.7%. The mortality ratio for males decreased from 85.3%

TABLE 5  
 MEDICAL, PARAMEDICAL, NONMEDICAL 1989-90 EXPERIENCE BY ISSUE AGE AND POLICY YEAR  
 MALE AND FEMALE LIVES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1 15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Medical										
0-19 .....	\$ 0	0.0%	\$ 50	15.8%	\$ 571	91.5%	\$ 581	85.4%	\$ 1,203	60.6%
20-29 .....	524	30.0	2,003	141.9	1,315	49.3	2,138	58.0	5,981	62.9
30-39 .....	3,893	30.8	14,455	75.9	23,482	76.4	14,508	64.4	56,339	66.3
40-49 .....	45,568	140.3	23,098	49.7	33,475	61.5	32,267	78.3	134,410	77.0
50-59 .....	17,768	57.4	31,588	66.7	63,180	91.3	58,689	105.4	171,227	84.3
60 and over .....	15,636	64.6	34,183	74.0	39,457	78.1	29,031	97.5	118,308	78.5
Total .....	\$ 83,391	81.4%	\$105,378	65.5%	\$161,484	77.6%	\$137,218	89.4%	\$ 487,471	78.0%
Paramedical										
0-19 .....	\$ 55	15.6%	\$ 35	10.3%	\$ 509	110.2%	\$ 170	45.9%	\$ 769	50.4%
20-29 .....	4,145	63.2	2,294	55.4	4,345	95.2	3,154	74.6	13,938	71.5
30-39 .....	19,136	51.7	27,767	62.6	27,551	62.4	15,182	75.1	89,637	61.5
40-49 .....	27,019	50.2	53,481	75.5	49,618	85.1	21,452	91.2	151,572	73.4
50-59 .....	22,626	77.6	42,912	87.7	57,435	98.0	20,336	106.0	143,311	91.9
60 and over .....	17,461	120.5	29,675	93.8	32,405	101.2	6,886	127.7	86,429	103.5
Total .....	\$ 90,446	64.0%	\$156,165	78.0%	\$171,864	86.7%	\$ 67,182	92.1%	\$ 485,659	79.3%

TABLE 5—Continued

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1-15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Nonmedical										
0-19 .....	\$ 8,251	76.8%	\$ 7,124	70.8%	\$ 9,608	82.6%	\$ 7,602	95.5%	\$ 32,586	80.6%
20-29 .....	18,839	69.7	27,795	96.9	28,138	106.2	13,892	95.4	88,665	91.6
30-39 .....	25,464	70.0	45,995	81.0	40,268	74.1	11,975	89.3	123,703	76.9
40-49 .....	16,356	96.4	28,113	94.0	27,968	89.2	5,581	104.8	78,020	93.4
50-59 .....	6,574	103.6	10,740	102.8	14,681	114.3	2,997	117.4	34,994	108.7
60 and over .....	2,765	100.8	5,493	101.0	2,287	64.4	364	94.2	10,911	90.0
Total .....	\$ 78,250	78.1%	\$125,263	88.7%	\$122,953	87.7%	\$42,414	96.0%	\$ 368,882	86.6%
All Issues										
0-19 .....	\$ 8,306	72.4%	\$ 7,209	67.2%	\$ 10,689	84.1%	\$ 8,354	92.7%	\$ 34,559	78.7%
20-29 .....	23,508	66.5	32,093	93.7	33,798	100.2	19,185	85.4	108,585	86.3
30-39 .....	48,494	56.3	88,217	73.4	91,302	70.7	41,666	74.2	269,680	68.9
40-49 .....	88,945	86.2	104,693	71.1	111,062	77.1	59,302	84.7	364,004	78.4
50-59 .....	46,969	70.7	85,241	79.9	135,297	96.2	82,023	105.9	349,533	89.3
60 and over .....	35,863	86.5	69,432	83.4	74,150	86.1	36,283	102.1	215,729	87.6
Total .....	\$252,088	73.3%	\$386,887	77.0%	\$456,302	83.5%	\$246,815	91.2%	\$1,342,093	80.7%

TABLE 6

SUMMARY OF MEDICAL, PARAMEDICAL, NONMEDICAL 1989-90 MORTALITY RATIOS  
 MALE AND FEMALE LIVES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES

Ages at Issue	Policy Years 1-2			Policy Years 3-5			Policy Years 6-10			Policy Years 11-15			Policy Years 1-15		
	Mortality Ratios														
	Med	Para	Non	Med	Para	Non	Med	Para	Non	Med	Para	Non	Med	Para	Non
0-19 .....	0.0%	15.6%	76.8%	15.8%	10.3%	70.8%	91.5%	110.2%	82.6%	85.4%	45.9%	95.5%	60.6%	50.4%	80.6%
20-29 .....	30.0	63.2	69.7	141.9	55.4	96.9	49.3	95.2	106.2	58.0	74.6	95.4	62.9	71.5	91.6
30-39 .....	30.8	51.7	70.0	75.9	62.6	81.0	76.4	62.4	74.1	64.4	75.1	89.3	66.3	61.5	76.9
40-49 .....	140.3	50.2	96.4	49.7	75.5	94.0	61.5	85.1	89.2	78.3	91.2	104.8	77.0	73.4	93.4
50-59 .....	57.4	77.6	103.6	66.7	87.7	102.8	91.3	98.0	114.3	105.4	106.0	117.4	84.3	91.9	108.7
60 and over .....	64.6	120.5	100.8	74.0	93.8	101.0	78.1	101.2	64.4	97.5	127.7	94.2	78.5	103.5	90.0
Total .....	81.4%	64.0%	78.1%	65.5%	78.0%	88.7%	77.6%	86.7%	87.7%	89.4%	92.1%	96.0%	78.0%	79.3%	86.6%
Ages at Issue	Ratio of Mortality Ratios														
	Para to Med	Non to Para	Non to Med	Para to Med	Non to Para	Non to Med	Para to Med	Non to Para	Non to Med	Para to Med	Non to Para	Non to Med	Para to Med	Non to Para	Non to Med
	Med	Para	Med	Med	Para	Med	Med	Para	Med	Med	Para	Med	Med	Para	Med
0-19 .....	0.00	4.91	0.00	0.65	6.86	4.47	1.20	0.75	0.90	0.54	2.08	1.12	0.83	1.60	1.33
20-29 .....	2.11	1.10	2.33	0.39	1.75	0.68	1.93	1.12	2.16	1.29	1.28	1.65	1.14	1.28	1.46
30-39 .....	1.68	1.35	2.27	0.83	1.29	1.07	0.82	1.19	0.97	1.17	1.19	1.39	0.93	1.25	1.16
40-49 .....	0.36	1.92	0.69	1.52	1.25	1.89	1.38	1.05	1.45	1.16	1.15	1.34	0.95	1.27	1.21
50-59 .....	1.35	1.34	1.80	1.31	1.17	1.54	1.07	1.17	1.25	1.01	1.11	1.11	1.09	1.18	1.29
60 and over .....	1.87	0.84	1.56	1.27	1.08	1.36	1.30	0.64	0.82	1.31	0.74	0.97	1.32	0.87	1.15
Total .....	0.79	1.22	0.96	1.19	1.14	1.35	1.12	1.01	1.13	1.03	1.04	1.07	1.02	1.09	1.11

Key: Med = Medical  
 Para = Paramedical  
 Non = Nonmedical

to 83.4% and the mortality ratio for females decreased from 87.5% to 84.3%. These mortality ratios are based on expected deaths derived from the separate male and female 1975-80 Basic Tables.

The mortality ratios by underwriting basis in the current five-year study are 81.0% for medical, 83.8% for paramedical, and 87.3% for nonmedical. The comparable ratios from the prior five-year study are 83.6%, 86.7%, and 88.3%, respectively. Thus, improvement occurred in all categories. As noted before, these aggregate ratios by underwriting basis are not directly comparable because of the different distributions by issue age.

#### *By Issue Age (Tables 7 and 9)*

Actual-to-expected mortality exceeds 100% only for issue ages 20-24. This occurs for females for all issue ages 55 and over. These patterns hold generally by underwriting basis when the business is analyzed separately for medical, paramedical, and nonmedical issues.

#### *By Policy Year (Tables 8 and 10)*

The lowest mortality ratios by duration for males in the 1985-90 experience occur in the first five policy years. There is somewhat of a tendency for the female ratios to increase by duration.

By underwriting basis the only mortality ratios for males in excess of 100% occur for nonmedical business at durations 9-15. For females, the general trend upward by duration noted above can be seen for each underwriting basis, although more irregularly.

#### *Comparison of Medical, Paramedical, and Nonmedical Experience*

Although, as mentioned before, caution needs to be exercised in comparing mortality ratios by underwriting basis because of the different distributions by issue age, the overall pattern for males (80.2% for medical, 83.0% for paramedical, and 89.9% for nonmedical) conforms with the supposition that higher ratios will occur for the less exacting requirements, but this pattern is nearly totally reversed for females (87.8% for medical, 88.3% for paramedical, and 79.6% for nonmedical). This might suggest that examinations, because they largely identify cardiovascular risk profile characteristics (build, blood pressure, and pulse), may be of relatively less value in underwriting females at the older ages, at which more of the less favorable paramedical and medical experience occurs and the cancer risk may exceed the cardiovascular risk.

TABLE 7  
 MALE AND FEMALE 1985-90 EXPERIENCE BY ISSUE AGE  
 MEDICAL, PARAMEDICAL, NONMEDICAL COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Male			Female			Combined		
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio
0-9.....	\$ 109,032	\$ 33,591	70.1%	\$ 93,231	\$ 18,257	68.7%	\$ 202,263	\$ 51,848	69.6%
10-14.....	34,624	24,225	85.7	26,587	7,688	77.8	61,212	31,914	83.7
15-19.....	67,258	68,207	91.6	43,762	17,393	92.5	111,021	85,600	91.8
20-24.....	182,303	148,399	101.4	105,358	35,885	82.5	287,662	184,284	97.1
25-29.....	418,991	286,986	85.4	189,708	65,759	72.3	608,700	352,746	82.6
30-34.....	592,320	456,591	77.8	212,143	93,036	64.9	804,464	549,628	75.3
35-39.....	581,521	617,007	75.8	171,027	112,534	69.9	752,549	729,541	74.8
40-44.....	419,024	674,605	79.0	103,641	110,870	72.9	522,666	785,475	78.1
45-49.....	261,761	710,164	83.3	59,666	113,427	89.3	321,428	823,591	84.1
50-54.....	165,138	675,633	90.8	37,783	105,625	95.2	202,922	781,259	91.4
55-59.....	104,732	606,166	84.9	25,831	103,459	102.7	130,563	709,625	87.1
60-64.....	49,630	413,393	89.7	15,931	87,313	105.3	65,562	500,707	92.1
65-69.....	16,075	202,905	79.5	7,194	53,478	111.1	23,269	256,384	84.6
70 and over.....	4,313	81,746	98.9	3,088	41,952	139.4	7,402	123,699	109.7
Total.....	\$3,006,730	\$4,999,625	83.4%	\$1,094,957	\$966,681	84.3%	\$4,101,688	\$5,966,307	83.5%

TABLE 8  
 MALE AND FEMALE 1985-90 EXPERIENCE BY POLICY YEAR  
 MEDICAL, PARAMEDICAL, NONMEDICAL COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Policy Year	Male			Female			Combined		
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio
1 .....	\$ 625,092	\$ 490,954	77.5%	\$ 248,082	\$ 91,703	66.3%	\$ 873,175	\$ 582,657	75.5%
2 .....	508,748	541,373	79.7	193,116	96,437	70.6	701,865	637,811	78.2
3 .....	422,366	589,538	81.1	155,504	109,412	81.3	577,871	698,951	81.1
4 .....	336,606	553,470	82.6	121,733	108,540	86.7	458,340	662,010	83.2
5 .....	256,213	468,628	80.8	89,743	96,652	89.6	345,957	565,280	82.2
6 .....	195,479	404,687	84.5	67,569	85,182	92.4	263,049	489,870	85.7
7 .....	149,593	332,664	84.3	51,290	66,022	85.8	200,883	398,687	84.6
8 .....	110,854	268,550	87.0	37,963	53,230	86.9	148,818	321,781	87.0
9 .....	86,948	245,847	94.7	30,043	51,147	99.9	116,992	296,994	95.6
10 .....	72,292	199,686	85.2	24,463	39,903	89.3	96,755	239,589	85.9
11 .....	60,598	185,910	85.2	20,186	37,117	90.7	80,784	223,028	86.0
12 .....	53,180	204,406	97.4	17,212	35,210	93.9	70,392	239,616	96.8
13 .....	47,249	171,874	84.4	14,712	34,622	99.6	61,961	206,496	86.6
14 .....	42,721	175,498	87.4	12,594	30,986	93.1	55,315	206,485	88.3
15 .....	38,784	166,534	83.9	10,740	30,509	98.9	49,525	197,044	85.9
Total .....	\$3,006,730	\$4,999,625	83.4%	\$1,094,957	\$966,681	84.3%	\$4,101,688	\$5,966,307	83.5%



TABLE 9

MALE AND FEMALE 1985-90 EXPERIENCE BY ISSUE AGE  
 MEDICAL, PARAMEDICAL, NONMEDICAL SEPARATELY  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Medical		Paramedical		Nonmedical	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male						
0-9 .....	\$ 710	31.0%	\$ 135	17.0%	\$ 32,437	72.8%
10-14 .....	1,376	66.3	626	58.6	22,173	89.0
15-19 .....	2,865	78.5	2,926	88.7	61,885	92.6
20-24 .....	10,844	107.0	13,305	99.2	122,313	101.3
25-29 .....	38,494	95.0	43,326	71.5	199,130	87.2
30-34 .....	97,466	74.6	127,826	71.0	223,112	84.7
35-39 .....	195,599	73.9	219,488	69.6	188,016	86.6
40-44 .....	260,853	72.3	266,162	78.2	130,379	96.8
45-49 .....	355,894	85.7	255,948	79.7	82,660	83.8
50-54 .....	365,428	85.2	244,583	95.6	51,844	115.9
55-59 .....	326,498	76.8	227,240	95.1	41,225	109.9
60-64 .....	254,990	86.0	134,365	99.2	17,367	82.8
65-69 .....	137,066	76.7	56,993	90.1	6,873	70.3
70 and over .....	50,978	87.4	25,379	130.4	4,597	114.6
Total .....	\$2,099,067	80.2%	\$1,618,307	83.0%	\$1,184,017	89.9%
Female						
0-9 .....	\$ 811	78.8%	\$ 50	14.3%	\$ 17,346	69.4%
10-14 .....	359	65.8	275	87.1	7,054	79.0
15-19 .....	370	58.3	495	77.7	16,528	95.0
20-24 .....	1,114	90.3	1,305	66.2	33,132	83.4
25-29 .....	4,518	106.9	4,722	59.5	55,990	72.4
30-34 .....	7,164	55.0	18,321	67.0	66,012	65.6
35-39 .....	16,466	68.0	32,651	64.6	61,303	73.6
40-44 .....	23,981	71.2	41,263	67.2	44,353	82.3
45-49 .....	34,406	87.0	47,770	84.4	28,926	101.9
50-54 .....	38,875	84.3	48,005	98.7	17,058	119.5
55-59 .....	41,053	88.6	46,443	110.3	14,787	137.4
60-64 .....	43,137	94.2	39,108	120.3	4,151	114.9
65-69 .....	30,263	97.1	18,964	123.8	3,405	292.7
70 and over .....	28,404	134.6	12,149	167.1	953	65.0
Total .....	\$ 270,927	87.8%	\$ 311,526	88.3%	\$ 371,005	79.6%
Male/Female Combined						
0-9 .....	\$ 1,521	45.8%	\$ 185	16.2%	\$ 49,783	71.6%
10-14 .....	1,735	66.2	901	65.1	29,228	86.4
15-19 .....	3,235	75.5	3,421	86.9	78,414	93.1
20-24 .....	11,959	105.2	14,610	94.9	155,446	96.8
25-29 .....	43,013	96.1	48,048	70.1	255,121	83.4
30-34 .....	104,630	72.8	146,148	70.4	289,124	79.4
35-39 .....	212,065	73.4	252,140	68.9	249,319	83.0
40-44 .....	284,834	72.2	307,426	76.5	174,732	92.7
45-49 .....	390,301	85.8	303,718	80.4	111,587	87.9
50-54 .....	404,303	85.1	292,588	96.1	68,902	116.7
55-59 .....	367,552	78.0	273,684	97.4	56,012	116.1
60-64 .....	298,128	87.1	173,474	103.3	21,518	87.5
65-69 .....	167,330	79.7	75,957	96.6	10,278	93.9
70 and over .....	79,382	99.9	37,528	140.4	5,551	101.3
Total .....	\$2,369,995	81.0%	\$1,929,834	83.8%	\$1,555,022	87.3%

TABLE 10

MALE AND FEMALE 1985-90 EXPERIENCE BY POLICY YEAR  
 MEDICAL, PARAMEDICAL, NONMEDICAL SEPARATELY  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Policy Year	Medical		Paramedical		Nonmedical	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male						
1	\$ 159,113	83.0%	\$ 170,012	72.1%	\$ 152,052	78.8%
2	160,683	71.9	198,355	77.9	161,579	89.6
3	183,804	73.4	213,764	80.7	166,639	89.1
4	184,045	76.2	201,353	83.3	155,451	91.6
5	165,689	75.7	169,888	81.4	123,682	88.9
6	159,597	82.2	142,267	83.6	96,899	89.6
7	145,265	82.7	117,036	87.1	68,405	84.5
8	124,909	81.7	93,015	92.5	49,086	93.2
9	132,392	93.7	76,103	94.8	36,240	101.3
10	105,802	78.3	62,330	92.6	30,189	101.3
11	103,361	78.0	53,055	94.8	28,265	101.2
12	129,587	96.7	44,667	95.1	28,802	105.5
13	109,545	80.5	33,118	85.2	27,396	101.7
14	119,714	84.5	25,855	88.4	28,884	102.4
15	115,552	78.2	17,481	87.6	30,440	103.2
Total	\$2,099,067	80.2%	\$1,618,307	83.0%	\$1,184,017	89.9%
Female						
1	\$ 15,224	62.5%	\$ 26,401	63.4%	\$ 48,660	70.9%
2	19,584	72.9	31,644	73.3	42,321	68.0
3	21,925	79.3	33,768	81.1	48,866	80.2
4	25,588	95.5	35,806	92.0	45,895	80.4
5	22,317	90.9	35,037	100.1	37,728	80.9
6	20,368	87.8	31,587	102.5	32,526	87.0
7	16,339	76.2	25,089	95.8	24,593	84.9
8	14,881	77.3	20,862	97.4	17,441	85.9
9	19,677	111.2	17,383	94.7	13,963	93.1
10	15,467	92.7	14,103	92.5	10,312	81.9
11	14,421	89.3	12,118	97.8	10,548	86.1
12	14,614	93.3	10,418	102.5	10,015	86.8
13	17,349	111.3	7,940	98.5	9,297	84.4
14	15,623	95.9	5,755	94.8	9,534	88.0
15	17,541	106.6	3,608	92.5	9,298	89.0
Total	\$ 270,927	87.8%	\$ 311,526	88.3%	\$ 371,005	79.6%
Male/Female Combined						
1	\$ 174,338	80.7%	\$ 196,413	70.8%	\$ 200,712	76.7%
2	180,267	72.0	230,000	77.3	203,901	84.1
3	205,730	74.0	247,533	80.8	215,506	86.9
4	209,634	78.1	237,159	84.5	201,347	88.8
5	188,007	77.2	204,926	84.1	161,411	86.9
6	179,966	82.8	173,855	86.5	129,426	88.9
7	161,605	82.0	142,125	88.5	92,999	84.6
8	139,791	81.3	113,877	93.3	66,527	91.1
9	152,070	95.7	93,487	94.8	50,204	98.8
10	121,269	79.9	76,434	92.5	40,501	95.5
11	117,783	79.3	65,173	95.3	38,814	96.6
12	144,201	96.4	55,086	96.5	38,817	100.0
13	126,895	83.6	41,059	87.5	36,693	96.7
14	135,337	85.7	31,611	89.5	38,418	98.4
15	133,094	81.0	21,090	88.4	39,739	99.5
Total	\$2,369,995	81.0%	\$1,929,834	83.8%	\$1,555,022	87.3%

***By Issue Age and Policy Year (Tables 11-15)***

Tables 11-14 subdivide the 1985-90 experience into the same six issue-age groups and the same four policy-year groups as in Table 5, but with the additional breakdown by sex. This provides an opportunity to examine the experience by issue age-policy year cells.

Table 15 summarizes these mortality ratios and gives the ratio of the mortality ratios as in Table 6, again with the additional breakdown by sex. For males, as expected, the ratios of the less exacting underwriting requirement to the more exacting basis generally exceed 1.00, as in Table 6, except where the comparisons are distorted by small amounts of data. For females, these expected results do not hold. A possible explanation for this phenomenon was suggested in the previous section.

**III. SMOKER-NONSMOKER EXPERIENCE**

Tables 16-21 present smoker-nonsmoker experience for issues of 1980 through 1989. Tables 16 and 17 show the experience between 1988 and 1989 anniversaries by issue age and policy year, respectively, separately for medical, paramedical, and nonmedical issues, as submitted by 17 of the 19 overall contributing companies. Tables 18 and 19 show the experience between 1984 and 1989 anniversaries but are otherwise identical to Tables 16 and 17. Tables 20 and 21 show the 1984-89 experience subdivided by sex. Eighteen companies contributed to the five-year study.

For 1988-89 experience given in Tables 16 and 17, the overall mortality ratio for nonsmokers is 62.4%, compared to 163.4% for smokers, resulting in a ratio of smoker to nonsmoker mortality of 2.62. These results are largely influenced by the unusually high actual deaths among smokers at issue ages 40-49 in the medical experience. By underwriting basis, the nonsmoker mortality ratio, smoker mortality ratio, and smoker-to-nonsmoker ratio are 53.9%, 215.7%, and 4.00 for medical experience; 63.1%, 141.3%, and 2.24 for paramedical; and 72.3%, 145.5%, and 2.01 for nonmedical, respectively.

The 1985-90 experience in Tables 18 and 19 is influenced by the 1989-90 medical experience described above. The same data are grouped by sex in Tables 20 and 21. The 1985-90 results are summarized below:

	Nonsmoker	Smoker	Ratio
Medical	63.5%	158.5%	2.49
Paramedical	64.2%	145.6%	2.27
Nonmedical	71.0%	142.9%	2.01
Male	65.8%	150.7%	2.29
Female	66.2%	137.8%	2.08
Total	65.9%	148.5%	2.25

TABLE 11

MALE AND FEMALE MEDICAL 1985-90 EXPERIENCE BY ISSUE AGE AND POLICY YEAR  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1-15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male										
0-19 .....	\$ 100	10.3%	\$ 530	41.8%	\$ 2,100	71.5%	\$ 2,221	78.3%	\$ 4,951	61.8%
20-29 .....	2,606	39.1	8,548	103.8	20,267	141.2	17,916	83.7	49,339	97.4
30-39 .....	31,143	56.3	77,630	76.8	106,259	85.5	78,033	68.1	293,066	74.2
40-49 .....	116,078	89.8	152,870	70.8	150,886	69.7	196,911	91.9	616,747	79.5
50-59 .....	85,498	65.5	172,852	81.6	241,586	88.3	191,989	80.7	691,927	81.0
60 and over .....	84,369	91.2	121,107	70.1	146,867	88.0	90,690	89.6	443,035	83.1
All Ages .....	\$319,797	77.0%	\$533,540	75.0%	\$667,968	83.6%	\$577,762	83.5%	\$2,099,067	80.2%
Female										
0-19 .....	\$ 310	70.5%	\$ 102	22.8%	\$ 623	82.4%	\$ 504	89.2%	\$ 1,540	69.7%
20-29 .....	568	69.6	1,913	177.2	1,348	80.5	1,804	95.4	5,633	103.1
30-39 .....	2,117	39.7	3,933	44.2	10,142	78.5	7,437	73.6	23,630	63.4
40-49 .....	8,590	79.0	14,882	86.6	13,806	61.6	21,109	92.7	58,388	79.7
50-59 .....	8,325	65.6	14,406	65.9	29,000	92.3	28,196	106.5	79,928	86.5
60 and over .....	14,899	70.7	34,594	117.1	31,813	109.3	20,498	111.8	101,806	103.8
All Ages .....	\$ 34,809	68.0%	\$ 69,832	88.4%	\$ 86,735	88.3%	\$ 79,550	99.2%	\$ 270,927	87.8%
Male/Female Combined										
0-19 .....	\$ 410	29.0%	\$ 632	36.9%	\$ 2,724	73.7%	\$ 2,725	80.1%	\$ 6,491	63.5%
20-29 .....	3,174	42.5	10,461	112.3	21,615	134.8	19,721	84.6	54,972	97.9
30-39 .....	33,260	54.8	81,563	74.2	116,402	84.8	85,470	68.6	316,696	73.2
40-49 .....	124,668	88.9	167,753	71.9	164,692	68.9	218,021	92.0	675,136	79.5
50-59 .....	93,823	65.5	187,259	80.1	270,587	88.7	220,185	83.3	771,856	81.6
60 and over .....	99,268	87.4	155,702	77.0	178,681	91.1	111,188	93.0	544,841	86.3
All Ages .....	\$354,606	76.0%	\$603,372	76.4%	\$754,703	84.1%	\$657,313	85.1%	\$2,369,995	81.0%

TABLE 12

MALE AND FEMALE PARAMEDICAL 1985-90 EXPERIENCE BY ISSUE AGE AND POLICY YEAR  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1-15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male										
0-19.....	\$ 668	63.1%	\$ 564	58.9%	\$ 1,793	83.8%	\$ 662	65.9%	\$ 3,687	71.4%
20-29.....	12,538	60.0	10,976	67.3	20,756	90.6	12,360	88.7	56,631	76.5
30-39.....	78,191	62.2	109,565	68.4	113,698	74.8	45,859	79.8	347,315	70.1
40-49.....	122,090	68.8	185,076	75.1	154,099	89.0	60,844	94.0	522,111	78.9
50-59.....	102,142	88.2	181,887	96.4	142,949	98.8	44,843	98.7	471,823	95.4
60 and over.....	52,737	106.9	96,936	94.5	57,455	99.4	9,608	113.4	216,738	99.3
All Ages.....	\$368,368	75.1%	\$585,006	81.8%	\$490,753	88.8%	\$174,179	91.2%	\$1,618,307	83.0%
Female										
0-19.....	\$ 194	55.8%	\$ 55	18.3%	\$ 501	105.9%	\$ 70	38.5%	\$ 820	63.0%
20-29.....	1,148	40.4	800	34.1	2,789	88.4	1,290	82.2	6,027	60.8
30-39.....	12,135	63.2	14,469	61.6	18,679	70.0	5,689	66.4	50,973	65.4
40-49.....	14,929	47.5	28,916	75.3	30,811	90.3	14,376	102.3	89,033	75.5
50-59.....	16,146	89.0	30,949	105.1	34,035	109.6	13,317	109.8	94,448	104.1
60 and over.....	13,491	105.1	29,421	136.2	22,210	134.1	5,098	124.8	70,222	127.5
All Ages.....	\$ 58,046	68.5%	\$104,612	90.5%	\$109,026	97.3%	\$ 39,841	98.1%	\$ 311,526	88.3%
Male/Female Combined										
0-19.....	\$ 862	61.3%	\$ 619	49.2%	\$ 2,294	87.8%	\$ 732	61.7%	\$ 4,507	69.7%
20-29.....	13,686	57.6	11,776	63.1	23,545	90.3	13,651	88.1	62,659	74.6
30-39.....	90,327	62.3	124,034	67.5	132,377	74.1	51,548	78.1	398,288	69.5
40-49.....	137,019	65.6	213,993	75.1	184,911	89.2	75,220	95.5	611,144	78.4
50-59.....	118,289	88.3	212,837	97.6	176,985	100.7	58,160	101.0	566,272	96.7
60 and over.....	66,229	106.5	126,357	101.7	79,666	107.1	14,706	117.1	286,960	105.0
All Ages.....	\$426,414	74.2%	\$689,619	83.0%	\$599,780	90.2%	\$214,020	92.4%	\$1,929,834	83.8%

TABLE 13

MALE AND FEMALE NONMEDICAL 1985-90 EXPERIENCE BY ISSUE AGE AND POLICY YEAR  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1-15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male										
0-19 .....	\$ 22,662	68.1%	\$ 28,920	83.3%	\$ 33,870	87.3%	\$ 31,042	105.0%	\$ 116,496	85.4%
20-29 .....	82,396	73.9	100,503	94.9	82,205	105.5	56,339	104.5	321,444	92.0
30-39 .....	114,553	83.6	167,993	85.3	89,670	83.8	38,911	98.3	411,128	85.6
40-49 .....	57,403	96.7	96,389	89.7	47,936	86.7	11,309	101.8	213,039	91.3
50-59 .....	26,454	121.9	38,764	111.8	22,637	107.3	5,212	108.9	93,069	113.2
60 and over .....	10,161	98.7	13,202	81.3	4,502	61.7	973	104.4	28,839	83.0
All Ages .....	\$313,632	84.0%	\$445,774	89.9%	\$280,822	91.4%	\$143,788	102.8%	\$1,184,017	89.9%
Female										
0-19 .....	\$ 13,065	79.3%	\$ 9,161	67.9%	\$ 10,935	85.5%	\$ 7,767	90.5%	\$ 40,929	79.7%
20-29 .....	22,086	64.9	27,341	74.2	25,795	92.6	13,900	75.5	89,123	76.1
30-39 .....	30,790	61.3	48,038	70.5	31,947	69.7	16,538	83.8	127,315	69.2
40-49 .....	17,080	76.2	28,110	86.0	19,512	100.8	8,576	110.4	73,280	89.1
50-59 .....	6,274	110.7	14,817	138.2	9,128	125.6	1,625	117.7	31,846	127.2
60 and over .....	1,685	78.9	5,021	179.7	1,517	136.2	286	144.1	8,510	136.3
All Ages .....	\$ 90,981	69.5%	\$132,490	80.5%	\$ 98,837	86.5%	\$ 48,695	86.8%	\$ 371,005	79.6%
Male/Female Combined										
0-19 .....	\$ 35,727	71.8%	\$ 38,082	79.0%	\$ 44,806	86.9%	\$ 38,810	101.8%	\$ 157,426	83.9%
20-29 .....	104,482	71.8	127,844	89.6	108,000	102.1	70,239	97.1	410,567	88.0
30-39 .....	145,344	77.6	216,031	81.5	121,618	79.6	55,449	93.5	538,444	81.0
40-49 .....	74,484	91.0	124,500	88.8	67,449	90.4	19,886	105.3	286,320	90.7
50-59 .....	32,728	119.6	53,582	118.1	31,765	112.0	6,838	110.9	124,915	116.4
60 and over .....	11,846	95.3	18,223	95.7	6,019	71.6	1,259	111.4	37,349	91.1
All Ages .....	\$404,614	80.3%	\$578,265	87.5%	\$379,659	90.0%	\$192,483	98.2%	\$1,555,022	87.3%

TABLE 14

MALE AND FEMALE 1985-90 EXPERIENCE BY ISSUE AGE AND POLICY YEAR  
 MEDICAL, PARAMEDICAL AND NONMEDICAL COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Policy Years 1-2		Policy Years 3-5		Policy Years 6-10		Policy Years 11-15		Policy Years 1-15	
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio
Male										
0-19 .....	\$ 24,114	67.1%	\$ 30,218	80.8%	\$ 37,764	86.0%	\$ 33,926	101.5%	\$ 126,024	83.7%
20-29 .....	100,677	70.7	123,567	92.5	124,148	106.5	86,992	96.8	435,386	90.2
30-39 .....	230,293	70.9	364,507	77.5	314,181	80.5	164,615	76.7	1,073,599	76.7
40-49 .....	304,864	81.2	450,092	76.6	355,875	79.1	273,937	93.5	1,384,769	81.2
50-59 .....	221,352	80.0	406,978	90.6	410,163	92.7	243,306	84.0	1,281,800	87.9
60 and over.....	151,025	96.5	236,272	79.1	209,302	90.0	101,445	91.6	698,045	87.4
All Ages .....	\$1,032,327	78.7%	\$1,611,636	81.5%	\$1,451,436	86.6%	\$ 904,224	87.7%	\$4,999,625	83.4%
Female										
0-19 .....	\$ 13,619	77.8%	\$ 9,318	64.7%	\$ 12,059	86.0%	\$ 8,341	89.4%	\$ 43,339	78.4%
20-29 .....	24,119	62.5	30,456	74.3	29,985	91.1	17,082	77.8	101,644	75.6
30-39 .....	46,289	60.2	68,287	66.4	61,111	70.9	29,882	77.4	205,570	67.5
40-49 .....	41,399	61.6	74,293	81.7	64,487	84.5	44,117	98.6	224,297	80.3
50-59 .....	31,879	84.3	61,885	97.1	72,179	103.1	43,139	107.7	209,084	98.8
60 and over.....	30,833	83.5	70,364	128.6	55,663	118.8	25,883	114.4	182,744	113.4
All Ages .....	\$ 188,140	68.4%	\$ 314,606	85.6%	\$ 295,486	90.6%	\$ 168,447	95.0%	\$ 966,681	84.3%
Male/Female Combined										
0-19 .....	\$ 37,733	70.6%	\$ 39,537	76.3%	\$ 49,824	86.0%	\$ 42,268	98.9%	\$ 169,363	82.3%
20-29 .....	124,797	68.9	154,023	88.2	154,134	103.1	104,075	93.0	537,031	87.0
30-39 .....	276,583	68.8	432,795	75.5	375,293	78.8	194,497	76.8	1,279,169	75.0
40-49 .....	346,263	78.2	524,386	77.3	420,362	79.9	318,055	94.2	1,609,066	81.1
50-59 .....	253,232	80.5	468,863	91.4	482,343	94.1	286,445	86.9	1,490,885	89.3
60 and over.....	181,858	94.0	306,637	86.8	264,966	94.8	127,328	95.5	880,790	91.8
All Ages .....	\$1,220,468	76.9%	\$1,926,243	82.2%	\$1,746,923	87.2%	\$1,072,671	88.8%	\$5,966,307	83.5%

TABLE 15

SUMMARY OF MALE AND FEMALE 1985-90 MORTALITY RATIOS  
MEDICAL, PARAMEDICAL AND NONMEDICAL SEPARATELY  
EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES

Ages at Issue	Policy Years 1-2			Policy Years 3-5			Policy Years 6-10			Policy Years 11-15			Policy Years 1-15		
	Mortality Ratios														
	Medical	Para-medical	Non-medical	Medical	Para-medical	Non-medical	Medical	Para-medical	Non-medical	Medical	Para-medical	Non-medical	Medical	Para-medical	Non-medical
Male															
0-19 .....	10.3%	63.1%	68.1%	41.8%	58.9%	83.3%	71.5%	83.8%	87.3%	78.3%	65.9%	105.0%	61.8%	71.4%	85.4%
20-29 .....	39.1	60.0	73.9	103.8	67.3	94.9	141.2	90.6	105.5	83.7	88.7	104.5	97.4	76.5	92.0
30-39 .....	56.3	62.2	83.6	76.8	68.4	85.3	85.5	74.8	83.8	68.1	79.8	98.3	74.2	70.1	85.6
40-49 .....	89.8	68.8	96.7	70.8	75.1	89.7	69.7	89.0	86.7	91.9	94.0	101.8	79.5	78.9	91.3
50-59 .....	65.5	88.2	121.9	81.6	96.4	111.8	88.3	98.8	107.3	80.7	98.7	108.9	81.0	95.4	113.2
60 and over .....	91.2	106.9	98.7	70.1	94.5	81.3	88.0	99.4	61.7	89.6	113.4	104.4	83.1	99.3	83.0
All Ages .....	77.0%	75.1%	84.0%	75.0%	81.8%	89.9%	83.6%	88.8%	91.4%	83.5%	91.2%	102.8%	80.2%	83.0%	89.9%
Female															
0-19 .....	70.5%	55.8%	79.3%	22.8%	18.3%	67.9%	82.4%	105.9%	85.3%	89.2%	38.5%	90.5%	69.7%	63.0%	79.7%
20-29 .....	69.6	40.4	64.9	177.2	34.1	74.2	80.5	88.4	92.6	95.4	82.2	75.5	103.1	60.8	76.1
30-39 .....	39.7	63.2	61.3	44.2	61.6	70.5	78.5	70.0	69.7	73.6	66.4	83.8	63.4	65.4	69.2
40-49 .....	79.0	47.5	76.2	86.6	75.3	86.0	61.6	90.3	100.8	92.7	102.3	110.4	79.7	75.5	89.1
50-59 .....	65.6	89.0	110.7	65.9	105.1	138.2	92.3	109.6	125.6	106.5	109.8	117.7	86.5	104.1	127.2
60 and over .....	70.7	105.1	78.9	117.1	136.2	179.7	109.3	134.1	136.2	111.8	124.8	144.1	103.8	127.5	136.3
All Ages .....	68.0%	68.5%	69.5%	88.4%	90.5%	80.5%	88.3%	97.3%	86.5%	99.2%	98.1%	86.8%	87.8%	88.3%	79.6%
Male/Female Combined															
0-19 .....	29.0%	61.3%	71.8%	36.9%	49.2%	79.0%	73.7%	87.8%	86.9%	80.1%	61.7%	101.8%	63.5%	69.7%	83.9%
20-29 .....	42.5	57.6	71.8	112.3	63.1	89.6	134.8	90.3	102.1	84.6	88.1	97.1	97.9	74.6	88.0
30-39 .....	54.8	62.3	77.6	74.2	67.5	81.5	84.8	74.1	79.6	68.6	78.1	93.5	73.2	69.5	81.0
40-49 .....	88.9	65.6	91.0	71.9	75.1	88.8	68.9	89.2	90.4	92.0	95.5	105.3	79.5	78.4	90.7
50-59 .....	65.5	88.3	119.6	80.1	97.6	118.1	88.7	100.7	112.0	83.3	101.0	110.9	81.6	96.7	116.4
60 and over .....	87.4	106.5	95.3	77.0	101.7	95.7	91.1	107.1	71.6	93.0	117.1	111.4	86.3	105.0	91.1
All Ages .....	76.0%	74.2%	80.3%	76.4%	83.0%	87.5%	84.1%	90.2%	90.0%	85.1%	92.4%	98.2%	81.0%	83.8%	87.3%



TABLE 15—Continued

Ages at Issue	Policy Years 1-2			Policy Years 3-5			Policy Years 6-10			Policy Years 11-15			Policy Years 1-15		
	Ratio of Mortality Ratios														
	Para to Med	Non to Para	Non to med	Para to Med	Non to Para	Non to med	Para to Med	Non to Para	Non to med	Para to Med	Non to Para	Non to med	Para to Med	Non to Para	Non to med
Male															
0-19 .....	6.14	1.08	6.62	1.41	1.42	1.99	1.17	1.04	1.22	0.84	1.59	1.34	1.16	1.20	1.38
20-29 .....	1.53	1.23	1.89	0.65	1.41	0.91	0.64	1.17	0.75	1.06	1.18	1.25	0.79	1.20	0.95
30-39 .....	1.10	1.34	1.48	0.89	1.25	1.11	0.87	1.12	0.98	1.17	1.23	1.44	0.95	1.22	1.15
40-49 .....	0.77	1.40	1.08	1.06	1.19	1.27	1.28	0.97	1.24	1.02	1.08	1.11	0.99	1.16	1.15
50-59 .....	1.35	1.38	1.86	1.18	1.16	1.37	1.12	1.09	1.22	1.22	1.10	1.35	1.18	1.19	1.40
60 and over.....	1.17	0.92	1.08	1.35	0.86	1.16	1.13	0.62	0.70	1.26	0.92	1.16	1.20	0.84	1.00
All Ages .....	0.98	1.12	1.09	1.09	1.10	1.20	1.06	1.03	1.09	1.09	1.13	1.23	1.04	1.08	1.12
Female															
0-19 .....	0.79	1.42	1.13	0.80	3.70	2.97	1.29	0.81	1.04	0.43	2.35	1.02	0.90	1.27	1.14
20-29 .....	0.58	1.61	0.93	0.19	2.18	0.42	1.10	1.05	1.15	0.86	0.92	0.79	0.59	1.25	0.74
30-39 .....	1.59	0.97	1.54	1.39	1.14	1.59	0.89	1.00	0.89	0.90	1.26	1.14	1.03	1.06	1.09
40-49 .....	0.60	1.60	0.96	0.87	1.14	0.99	1.46	1.12	1.63	1.10	1.08	1.19	0.95	1.18	1.12
50-59 .....	1.36	1.24	1.69	1.59	1.31	2.10	1.19	1.15	1.36	1.03	1.07	1.11	1.20	1.22	1.47
60 and over.....	1.49	0.75	1.12	1.16	1.32	1.53	1.23	1.02	1.25	1.12	1.16	1.29	1.23	1.07	1.31
All Ages .....	1.01	1.02	1.02	1.02	0.89	0.91	1.10	0.89	0.98	0.99	0.88	0.87	1.01	0.90	0.91
Male/Female Combined															
0-19 .....	2.11	1.17	2.47	1.33	1.61	2.14	1.19	0.99	1.18	0.77	1.65	1.27	1.10	1.20	1.32
20-29 .....	1.36	1.25	1.69	0.56	1.42	0.80	0.67	1.13	0.76	1.04	1.10	1.15	0.76	1.18	0.90
30-39 .....	1.14	1.25	1.42	0.91	1.21	1.10	0.87	1.07	0.94	1.14	1.20	1.36	0.95	1.17	1.11
40-49 .....	0.74	1.39	1.02	1.04	1.18	1.23	1.30	1.01	1.31	1.04	1.10	1.14	0.99	1.16	1.14
50-59 .....	1.35	1.35	1.83	1.22	1.21	1.47	1.13	1.11	1.26	1.21	1.10	1.33	1.19	1.20	1.43
60 and over.....	1.22	0.90	1.09	1.32	0.94	1.24	1.18	0.67	0.79	1.26	0.95	1.20	1.22	0.87	1.06
All Ages .....	0.98	1.08	1.06	1.09	1.05	1.15	1.07	1.00	1.07	1.09	1.06	1.15	1.03	1.04	1.08

Med = Medical  
 Para = Paramedical  
 Non = Nonmedical

TABLE 16  
 SMOKER-NONSMOKER 1989-90 EXPERIENCE BY ISSUE AGE  
 MEDICAL, PARAMEDICAL AND NONMEDICAL SEPARATELY; MALES AND FEMALES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Medical							
0-19 .....	\$ 886	\$ 50	11.5%	\$ 104	\$ 0	0.0%	0.00
20-29 .....	5,813	2,389	59.7	751	235	46.7	0.78
30-39 .....	39,929	27,957	61.7	4,753	7,103	125.8	2.04
40-49 .....	44,797	35,814	36.9	6,186	51,774	365.4	9.90
50-59 .....	23,790	59,580	57.8	3,565	27,771	169.2	2.93
60 and over .....	9,214	54,971	64.5	1,400	19,801	156.2	2.42
Total .....	\$124,432	\$180,764	53.9%	\$16,763	\$106,685	215.7%	4.00
Paramedical							
0-19 .....	\$ 675	\$ 201	52.1%	\$ 76	\$ 35	72.0%	1.38
20-29 .....	17,098	6,160	55.0	2,140	1,915	140.3	2.55
30-39 .....	94,280	47,698	50.8	13,079	14,199	105.5	2.08
40-49 .....	67,585	74,649	56.8	13,797	38,044	138.8	2.45
50-59 .....	21,786	69,486	75.6	4,912	32,078	151.6	2.01
60 and over .....	5,699	41,994	81.1	1,220	18,989	171.8	2.12
Total .....	\$207,125	\$240,190	63.1%	\$35,227	\$105,261	141.3%	2.24

TABLE 16—Continued

Ages at Issue	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Nonmedical							
0-19 .....	\$ 24,149	\$ 8,899	72.6%	\$ 1,831	\$ 1,036	93.7%	1.29
20-29 .....	94,280	47,356	82.0	15,392	13,944	147.8	1.80
30-39 .....	113,766	69,037	64.9	22,120	26,192	124.7	1.92
40-49 .....	25,707	39,449	75.1	6,503	20,993	159.6	2.12
50-59 .....	4,769	16,111	82.6	1,388	10,549	185.6	2.25
60 and over.....	983	4,756	57.2	274	3,818	171.5	3.00
Total .....	\$263,657	\$185,610	72.3%	\$47,510	\$ 76,534	145.5%	2.01
Combined							
0-19 .....	\$ 25,711	\$ 9,150	69.9%	\$ 2,013	\$ 1,071	88.0%	1.26
20-29 .....	117,192	55,906	76.6	18,284	16,094	142.4	1.86
30-39 .....	247,976	144,694	58.9	39,953	47,494	118.4	2.01
40-49 .....	138,089	149,913	53.3	26,488	110,812	202.5	3.80
50-59 .....	50,346	145,178	67.7	9,866	70,399	162.8	2.41
60 and over.....	15,898	101,722	70.0	2,895	42,610	164.2	2.34
Total .....	\$595,215	\$606,565	62.4%	\$99,501	\$288,481	163.4%	2.62

TABLE 17

SMOKER-NONSMOKER 1989-90 EXPERIENCE BY POLICY YEAR  
 MEDICAL, PARAMEDICAL AND NONMEDICAL SEPARATELY; MALES AND FEMALES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Year of Issue	Policy Year	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
		Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Medical								
1989 .....	1	\$ 28,456	\$ 15,436	39.8%	\$ 3,679	\$ 42,895	846.1%	21.27
1988 .....	2	22,119	13,141	31.3	2,886	6,530	119.2	3.81
1987 .....	3	18,189	27,850	58.4	2,138	8,998	157.3	2.69
1986 .....	4	14,300	25,828	58.2	1,678	4,968	94.2	1.62
1985 .....	5	10,893	20,283	56.2	1,387	5,881	115.5	2.05
1984 .....	6	9,910	23,417	65.3	1,371	10,581	195.6	3.00
1983 .....	7	9,876	22,561	56.6	1,518	6,789	102.3	1.81
1982 .....	8	6,598	16,547	58.8	1,227	6,901	119.8	2.04
1981 .....	9	2,736	12,492	85.6	585	9,358	281.7	3.29
1980 .....	10	1,350	3,204	42.2	289	3,781	222.1	5.26
All years .....	1-10	\$124,432	\$180,764	53.9%	\$16,763	\$106,685	215.7%	4.00
Paramedical								
1989 .....	1	\$ 54,497	\$ 23,010	44.9%	\$ 9,342	\$ 13,009	138.1%	3.07
1988 .....	2	41,342	29,031	54.2	7,375	13,844	130.6	2.41
1987 .....	3	31,307	36,139	64.7	4,996	13,760	137.8	2.13
1986 .....	4	24,661	34,924	67.4	3,412	12,299	145.6	2.16
1985 .....	5	17,569	29,117	64.8	2,801	12,512	148.9	2.30
1984 .....	6	13,920	31,283	72.5	2,353	13,762	157.7	2.17
1983 .....	7	11,738	26,047	64.9	2,311	12,609	140.7	2.17
1982 .....	8	7,859	19,262	72.7	1,760	9,285	138.1	1.90
1981 .....	9	3,062	7,744	78.7	668	3,101	123.3	1.57
1980 .....	10	1,164	3,628	98.6	204	1,077	151.2	1.53
All years .....	1-10	\$207,125	\$240,190	63.1%	\$35,227	\$105,261	141.3%	2.24

TABLE 17—Continued

Year of Issue	Policy Year	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
		Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Nonmedical								
1989 .....	1	\$ 58,900	\$ 24,451	66.5%	\$11,321	\$ 10,775	143.3%	2.15
1988 .....	2	41,361	19,561	63.0	8,688	10,524	145.9	2.32
1987 .....	3	36,718	23,457	71.4	6,818	11,128	146.9	2.06
1986 .....	4	36,290	26,090	72.4	5,021	8,332	146.1	2.02
1985 .....	5	26,770	24,969	80.4	4,175	9,015	162.1	2.01
1984 .....	6	24,010	24,865	78.9	3,810	8,549	149.2	1.89
1983 .....	7	22,210	24,775	77.0	3,953	8,351	123.8	1.61
1982 .....	8	13,523	13,344	67.3	2,882	7,818	152.7	2.27
1981 .....	9	3,424	3,293	67.7	739	1,587	123.9	1.83
1980 .....	10	447	801	117.5	99	451	293.4	2.50
All years .....	1-10	\$263,657	\$185,610	72.3%	\$47,510	\$ 76,534	145.5%	2.01
Combined								
1989 .....	1	\$141,854	\$ 62,898	49.6%	\$24,344	\$ 66,680	303.0%	6.11
1988 .....	2	104,823	61,734	48.7	18,950	30,898	132.7	2.72
1987 .....	3	86,215	87,447	64.1	13,953	33,886	145.5	2.27
1986 .....	4	75,252	86,844	65.7	10,112	25,600	131.8	2.01
1985 .....	5	55,233	74,369	66.4	8,363	27,409	143.8	2.17
1984 .....	6	47,841	79,566	72.0	7,536	32,894	165.6	2.30
1983 .....	7	43,825	73,384	65.4	7,784	27,751	124.2	1.90
1982 .....	8	27,981	49,154	66.0	5,870	24,004	136.4	2.07
1981 .....	9	9,223	23,530	80.3	1,993	14,046	197.4	2.46
1980 .....	10	2,961	7,634	63.9	593	5,309	206.7	3.24
All years .....	1-10	\$595,215	\$606,565	62.4%	\$99,501	\$288,481	163.4%	2.62

TABLE 18

SMOKER-NONSMOKER 1985-90 EXPERIENCE BY ISSUE AGE  
 MEDICAL, PARAMEDICAL AND NONMEDICAL SEPARATELY; MALES AND FEMALES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Medical							
0-19 .....	\$ 2,887	\$ 425	28.8%	\$ 402	\$ 10	4.2%	0.14
20-29 .....	23,995	15,212	93.8	3,316	1,880	85.7	0.91
30-39 .....	162,978	115,873	67.9	21,885	28,468	117.9	1.74
40-49 .....	166,536	186,523	54.8	25,648	102,252	184.8	3.37
50-59 .....	87,949	218,137	61.8	14,556	97,589	158.9	2.57
60 and over .....	32,146	197,597	72.4	5,250	65,941	151.5	2.09
Total .....	\$476,494	\$733,769	63.5%	\$ 71,059	\$296,142	158.5%	2.49
Paramedical							
0-19 .....	\$ 2,311	\$ 548	40.5%	\$ 441	\$ 86	32.2%	0.80
20-29 .....	61,610	23,299	57.9	8,140	5,213	99.7	1.72
30-39 .....	336,727	178,531	56.4	51,900	56,168	110.3	1.95
40-49 .....	228,129	243,292	58.0	48,761	120,456	130.2	2.25
50-59 .....	78,804	221,970	74.1	18,618	123,261	170.8	2.31
60 and over .....	19,977	127,249	78.7	4,489	69,323	191.7	2.44
Total .....	\$727,561	\$794,891	64.2%	\$132,352	\$374,510	145.6%	2.27

TABLE 18—Continued

Ages at Issue	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Nonmedical							
0-19 .....	\$ 88,958	\$ 34,304	74.4%	\$ 8,434	\$ 5,339	107.9%	1.45
20-29 .....	392,087	174,566	74.6	70,965	54,128	127.0	1.70
30-39 .....	442,973	249,500	66.2	91,787	100,996	125.6	1.90
40-49 .....	99,622	129,186	70.1	26,490	75,048	153.5	2.19
50-59 .....	17,895	57,025	88.1	5,334	42,826	221.1	2.51
60 and over .....	3,609	18,857	67.0	935	11,932	174.9	2.61
Total .....	\$1,045,146	\$ 663,440	71.0%	\$203,947	\$290,272	142.9%	2.01
Combined							
0-19 .....	\$ 94,157	\$ 35,277	72.0%	\$ 9,278	\$ 5,435	99.7%	1.38
20-29 .....	477,693	213,078	73.3	82,422	61,222	122.4	1.67
30-39 .....	942,679	543,905	62.9	165,573	185,633	119.4	1.90
40-49 .....	494,288	559,002	59.2	100,900	297,757	151.4	2.56
50-59 .....	184,648	497,133	69.3	38,509	263,678	172.4	2.49
60 and over .....	55,733	343,704	74.3	10,675	147,198	170.1	2.29
Total .....	\$2,249,202	\$2,192,101	65.9%	\$407,359	\$960,925	148.5%	2.25

TABLE 19

SMOKER-NONSMOKER 1985-90 EXPERIENCE BY POLICY YEAR  
 MEDICAL, PARAMEDICAL AND NONMEDICAL SEPARATELY; MALES AND FEMALES COMBINED  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Policy Year	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Medical							
1 .....	\$ 113,507	\$ 76,112	49.5%	\$ 15,889	\$ 64,217	294.3%	5.95
2 .....	95,422	112,775	63.8	12,754	29,874	126.5	1.98
3 .....	78,805	126,807	66.9	10,578	31,514	121.8	1.82
4 .....	62,529	119,450	68.4	9,003	37,555	144.2	2.11
5 .....	48,451	95,578	62.0	8,017	44,191	164.4	2.65
6 .....	35,542	85,830	68.3	6,399	34,665	144.6	2.12
7 .....	23,216	61,354	66.9	4,435	22,000	116.9	1.75
8 .....	12,133	30,820	58.2	2,459	15,307	132.3	2.27
9 .....	4,906	19,921	79.8	1,078	12,030	209.1	2.62
10 .....	1,977	5,119	47.7	443	4,784	188.6	3.95
All years 1-10.....	\$ 476,494	\$ 733,769	63.5%	\$ 71,059	\$296,142	158.5%	2.49
Paramedical							
1 .....	\$ 209,938	\$ 113,949	56.5%	\$ 37,720	\$ 52,945	135.8%	2.40
2 .....	159,746	125,044	58.7	27,572	64,307	157.8	2.69
3 .....	117,918	139,530	66.3	20,027	58,352	144.4	2.18
4 .....	87,516	129,668	68.9	15,434	57,603	152.0	2.21
5 .....	63,293	104,995	65.1	12,680	55,882	154.7	2.38
6 .....	43,122	84,941	69.0	8,880	38,736	136.6	1.98
7 .....	26,322	54,452	67.4	5,669	27,427	141.4	2.10
8 .....	13,260	27,774	67.9	2,944	12,862	124.3	1.83
9 .....	4,836	10,458	71.4	1,067	4,543	120.9	1.69
10 .....	1,606	4,077	83.5	353	1,848	148.9	1.78
All years 1-10.....	\$ 727,561	\$ 794,891	64.2%	\$132,352	\$374,510	145.6%	2.27



TABLE 19—Continued

Policy Year	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Nonmedical							
1 .....	\$ 273,024	\$ 110,625	64.6%	\$ 55,632	\$ 49,146	132.5%	2.05
2 .....	214,435	111,017	70.2	41,371	51,919	153.9	2.19
3 .....	176,047	114,394	72.5	33,326	48,634	144.3	1.99
4 .....	142,507	110,886	76.1	26,422	45,077	149.0	1.96
5 .....	103,824	87,200	72.5	20,230	37,489	142.0	1.96
6 .....	70,723	67,959	75.0	13,649	27,622	138.2	1.84
7 .....	42,018	39,653	68.0	8,399	18,142	133.2	1.96
8 .....	17,863	16,838	66.1	3,867	9,879	150.6	2.28
9 .....	4,082	3,997	69.1	899	1,889	126.1	1.83
10 .....	618	866	90.1	149	471	199.2	2.21
All years 1-10.....	\$1,045,146	\$ 663,440	71.0%	\$203,947	\$290,272	142.9%	2.01
Combined							
1 .....	\$ 596,470	\$ 300,688	57.1%	\$109,242	\$166,309	169.9%	2.98
2 .....	469,605	348,836	63.7	81,698	146,101	148.9	2.34
3 .....	372,772	380,732	68.2	63,932	138,501	138.5	2.03
4 .....	292,552	360,005	70.8	50,859	140,236	148.9	2.10
5 .....	215,570	287,773	66.0	40,928	137,562	153.9	2.33
6 .....	149,388	238,731	70.3	28,928	101,024	139.7	1.99
7 .....	91,558	155,459	67.4	18,505	67,570	130.4	1.93
8 .....	43,258	75,433	63.2	9,271	38,050	133.6	2.11
9 .....	13,825	34,376	75.7	3,045	18,462	167.7	2.22
10 .....	4,201	10,063	60.7	946	7,103	176.9	2.91
All years 1-10.....	\$2,249,202	\$2,192,101	65.9%	\$407,359	\$960,925	148.5%	2.25

TABLE 20

SMOKER-NONSMOKER 1985-90 EXPERIENCE BY ISSUE AGE  
 MEDICAL, PARAMEDICAL AND NONMEDICAL COMBINED; MALES AND FEMALES SEPARATELY  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Ages at Issue	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Male							
0-19 .....	\$ 51,180	\$ 25,025	71.5%	\$ 5,097	\$ 4,018	99.4%	1.39
20-29 .....	310,237	170,396	75.8	52,899	48,547	126.3	1.67
30-39 .....	705,084	453,823	64.3	124,863	158,918	124.5	1.94
40-49 .....	402,163	481,714	58.9	79,181	259,326	156.6	2.66
50-59 .....	151,437	437,145	69.1	29,843	221,030	170.3	2.46
60 and over.....	40,664	275,379	71.3	7,090	112,494	165.3	2.32
All Ages.....	\$1,660,767	\$1,843,484	65.8%	\$298,976	\$804,335	150.7%	2.29
Female							
0-19 .....	\$ 42,977	\$ 10,251	73.5%	\$ 4,180	\$ 1,417	100.3%	1.37
20-29 .....	167,456	42,681	64.9	29,522	12,675	109.4	1.69
30-39 .....	237,595	90,082	56.8	40,709	26,714	95.7	1.69
40-49 .....	92,125	77,288	61.0	21,719	38,431	123.5	2.02
50-59 .....	33,211	59,988	70.5	8,666	42,647	184.3	2.62
60 and over.....	15,068	68,325	89.4	3,585	34,703	187.9	2.10
All Ages.....	\$ 588,434	\$ 348,617	66.2%	\$108,383	\$156,589	137.8%	2.08

TABLE 21

SMOKER-NONSMOKER 1985-90 EXPERIENCE BY POLICY YEAR  
 MEDICAL, PARAMEDICAL AND NONMEDICAL COMBINED; MALES AND FEMALES SEPARATELY  
 ISSUES OF 1975-89 STUDIED BETWEEN 1985 AND 1990 ANNIVERSARIES  
 EXPECTED DEATHS BASED ON 1975-80 BASIC TABLES  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Policy Year	Nonsmoker			Smoker			Ratio of Smoker/Nonsmoker Mortality Ratios
	Exposure	Actual Deaths	Mortality Ratio	Exposure	Actual Deaths	Mortality Ratio	
Male							
1 .....	\$ 431,795	\$ 252,173	58.0%	\$ 78,889	\$142,815	179.0%	3.09
2 .....	345,488	299,558	65.3	59,347	123,920	154.5	2.37
3 .....	275,790	322,373	68.2	46,618	115,258	139.4	2.04
4 .....	216,059	301,221	70.3	37,303	115,570	148.7	2.12
5 .....	161,275	239,719	65.0	30,566	114,164	153.9	2.37
6 .....	112,969	198,350	69.1	21,839	82,607	138.2	2.00
7 .....	69,739	130,558	66.8	14,069	55,994	130.9	1.96
8 .....	33,259	62,592	61.8	7,135	32,631	138.7	2.24
9 .....	10,882	27,960	71.4	2,416	15,407	165.4	2.32
10 .....	3,508	8,975	60.8	791	5,966	169.7	2.79
All years 1-10.....	\$1,660,767	\$1,843,484	65.8%	\$298,976	\$804,335	150.7%	2.29
Female							
1 .....	\$ 164,675	\$ 48,514	52.8%	\$ 30,353	\$ 23,493	129.7%	2.46
2 .....	124,116	49,278	55.4	22,350	22,181	124.1	2.24
3 .....	96,981	58,359	68.6	17,314	23,243	134.5	1.96
4 .....	76,493	58,783	73.5	13,556	24,665	149.9	2.04
5 .....	54,294	48,054	71.8	10,362	23,398	153.8	2.14
6 .....	36,419	40,380	77.2	7,089	18,417	147.0	1.90
7 .....	21,818	24,901	70.6	4,435	11,576	128.1	1.81
8 .....	9,998	12,840	71.1	2,135	5,419	109.5	1.54
9 .....	2,943	6,416	102.8	629	3,055	180.5	1.76
10 .....	693	1,087	60.1	155	1,137	227.5	3.78
All years 1-10.....	\$ 588,434	\$ 348,617	66.2%	\$108,383	\$156,589	137.8%	2.08

In both the 1989-90 and the 1985-90 studies, the ratios of smoker to nonsmoker mortality are higher for the older issue-age groups, exceeding 2.00 for all issues combined in the one-year study for issue ages 30 and up and in the five-year study for issue ages 30 and up. In both studies, the pattern by policy year is irregular. In this regard, note that the maximum duration is policy year 10, with a concentration of the exposure in the earlier policy years.

Factors that confound the comparability of smoker and nonsmoker mortality include socioeconomic differences that tend to favor nonsmoker mortality and higher average policy size with consequent restrictive underwriting requirements for nonsmokers.

In the 1985-90 study, the proportion of nonsmoker to total exposure is 84.7% for males and 84.4% for females. Each such proportion is up slightly from the 1984-89 study (84.0% and 83.8%, respectively). These are somewhat higher proportions than may have been expected, perhaps due to nonadmission of smoking habits by some smokers.

#### IV. ULTIMATE EXPERIENCE (POLICY YEARS 16 AND OVER)

The experience between 1989 and 1990 anniversaries for policy years 16 and over is shown in Table 22. The overall mortality ratio based on the 1975-80 Ultimate Basic Tables is 84.0%, down from 84.8% in the 1988-89 study. Note that the company mix did not change between the two studies. The ratios by attained age group are fairly uniform, exceeding 100% only for attained ages 30-34, 35-39, and 90-95. Part of the extra mortality at the younger attained ages could be attributed to AIDS deaths.

Table 22 also presents mortality ratios based on the 1965-70 Ultimate Basic Tables, the 1980 CSO Tables, and the 1979-81 U.S. Population Life Tables (Whites and Non-Whites Combined), with overall mortality ratios of 66.2%, 63.9%, and 64.1%, respectively.

The experience between 1985 and 1990 anniversaries for policy years 16 and over is shown in Tables 23-25. In Table 23, the mortality ratio for premium-paying policies is 86.3%, compared to 88.5% for fully paid-up policies (reduced paid-up policies are not included). Corresponding ratios for the 1984-89 experience were 87.8% and 91.1%, respectively. This pattern of lower mortality ratios for premium-paying policies has been a characteristic of the experience for many years, perhaps due to a shorter average duration since selection compared to paid-up policies.

In Table 24, the mortality ratio for medical issues is 84.4%, compared to 97.7% for nonmedical issues. Corresponding ratios for the 1984-89 experience were 86.2% and 99.9%, respectively. This large difference in mortality ratios exists for virtually all attained age groups.

TABLE 22  
 1989-90 ULTIMATE EXPERIENCE BY ATTAINED AGE  
 MALE AND FEMALE LIVES COMBINED  
 ISSUES OF 1974 AND PRIOR STUDIED BETWEEN 1989 AND 1990 ANNIVERSARIES  
 POLICY YEARS 16 AND OVER  
 (EXPOSURES IN \$1,000,000 UNITS; ACTUAL DEATHS IN \$1,000 UNITS)

Attained Ages	Exposure	Actual Deaths	Mortality Ratios			
			1975-80 Ultimate Tables	1965-70 Ultimate Tables	1980 CSO Tables	1979-81 U.S. Life Tables
15-19 .....	\$ 2,096	\$ 1,340	74.1%	81.2%	46.4%	62.4%
20-24 .....	2,376	1,969	77.6	89.9	52.2	56.9
25-29 .....	2,680	2,596	97.5	105.9	62.4	65.0
30-34 .....	3,891	4,776	125.4	110.1	70.2	75.9
35-39 .....	7,656	11,141	116.8	90.4	62.4	66.9
40-44 .....	12,701	20,277	83.8	60.6	46.1	47.7
45-49 .....	14,359	35,806	77.6	57.5	48.4	46.2
50-54 .....	13,819	60,910	82.7	60.8	56.8	50.6
55-59 .....	13,697	96,537	81.9	59.4	58.8	52.7
60-64 .....	13,886	162,598	84.0	62.7	64.2	57.2
65-69 .....	11,036	196,951	80.3	61.5	62.7	58.8
70-74 .....	7,772	225,657	82.5	65.7	65.3	64.2
75-79 .....	4,920	233,189	85.8	68.8	66.7	72.5
80-84 .....	2,625	188,546	83.0	68.9	65.9	73.7
85-89 .....	991	112,591	86.0	73.3	67.8	79.6
90-95 .....	294	57,715	100.3	91.4	79.7	97.1
All Ages .....	\$114,807	\$1,412,606	84.0%	66.2%	63.9%	64.1%

TABLE 23  
 COMPARISONS OF 1985-90 ULTIMATE EXPERIENCE BY ATTAINED AGE  
 MALE AND FEMALE LIVES COMBINED  
 EXPERIENCE BETWEEN 1985 AND 1990 ANNIVERSARIES  
 POLICY YEARS 16 AND OVER  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Attained Ages	Premium-Paying		Fully Paid-up		Ratio of Premium-Paying to Paid-up Mortality Ratios
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	
15-19 .....	\$ 5,397	79.0%	\$ 205	204.7%	0.38%
20-24 .....	7,429	77.9	856	114.3	0.68
25-29 .....	9,927	99.9	1,358	128.1	0.77
30-34 .....	18,285	122.3	2,160	136.2	0.89
35-39 .....	47,234	111.5	3,114	137.6	0.81
40-44 .....	92,663	87.7	3,997	106.5	0.82
45-49 .....	166,447	83.3	5,306	91.5	0.91
50-54 .....	277,632	82.8	9,483	87.4	0.94
55-59 .....	500,585	89.3	22,278	91.9	0.97
60-64 .....	758,607	87.7	46,556	88.2	0.99
65-69 .....	796,681	81.7	118,264	86.7	0.94
70-74 .....	818,023	84.4	157,874	87.2	0.96
75-79 .....	765,910	85.9	188,388	88.1	0.97
80-84 .....	598,778	88.3	178,853	87.0	1.01
85-89 .....	303,246	88.5	150,147	87.4	1.01
90-95 .....	128,853	99.2	85,828	96.4	1.02
All Ages .....	\$5,295,706	86.3%	\$974,675	88.5%	0.97%

TABLE 24  
 COMPARISONS OF 1985-90 ULTIMATE EXPERIENCE BY ATTAINED AGE  
 MALE AND FEMALE LIVES COMBINED  
 EXPERIENCE BETWEEN 1985 AND 1990 ANNIVERSARIES  
 POLICY YEARS 16 AND OVER  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Attained Ages	Medical		Nonmedical		Ratio of Nonmedical to Medical Mortality Ratios
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	
15-19 .....	\$ 300	60.4%	\$ 4,923	79.2%	1.31
20-24 .....	777	65.1	6,786	80.8	1.24
25-29 .....	1,506	85.5	9,008	107.4	1.25
30-34 .....	2,050	86.7	16,297	129.2	1.48
35-39 .....	7,150	107.5	37,967	112.3	1.04
40-44 .....	20,228	72.4	67,152	94.4	1.30
45-49 .....	60,089	75.2	96,928	89.7	1.19
50-54 .....	139,179	75.6	124,900	91.7	1.21
55-59 .....	326,217	84.6	160,631	100.2	1.18
60-64 .....	580,222	83.8	168,941	104.2	1.24
65-69 .....	695,283	81.8	115,077	102.1	1.24
70-74 .....	781,761	83.7	73,692	98.9	1.18
75-79 .....	751,987	85.4	55,488	92.3	1.07
80-84 .....	592,692	87.0	41,211	89.9	1.03
85-89 .....	332,709	87.4	17,333	91.0	1.04
90-95 .....	149,325	96.2	6,837	95.8	0.99
All Ages .....	\$4,441,482	84.4%	\$1,003,179	97.7%	1.15

In Table 25, the mortality ratios for males is 87.0%, compared to 89.7% for females. Corresponding ratios for the 1984-89 experience were 88.7% and 90.6%, respectively. In the last column, the female mortality ratios used to calculate the female-to-male ratio of mortality ratios are based on the 1975-80 Ultimate Basic Table for Male Lives, so that male and female mortality ratios can be compared on the same basis. On this basis, the overall ratio of female to male mortality is 0.63, up from 0.62 in the prior five-year study.

TABLE 25  
 COMPARISONS OF 1985-90 ULTIMATE EXPERIENCE BY ATTAINED AGE  
 EXPERIENCE BETWEEN 1985 AND 1990 ANNIVERSARIES  
 POLICY YEARS 16 AND OVER  
 (ACTUAL DEATHS IN \$1,000 UNITS)

Attained Ages	Male		Female		Ratio of Female to Male Mortality Ratios
	Actual Deaths	Mortality Ratio	Actual Deaths	Mortality Ratio	
15-19 .....	\$ 4,586	80.3%	\$ 1,160	82.1%	0.40
20-24 .....	6,927	78.3	1,919	102.9	0.49
25-29 .....	9,979	104.8	2,352	116.6	0.47
30-34 .....	18,635	132.3	3,335	103.7	0.44
35-39 .....	45,441	119.0	7,339	87.7	0.54
40-44 .....	89,544	92.4	12,145	72.7	0.67
45-49 .....	164,501	86.1	17,695	76.7	0.68
50-54 .....	276,656	83.8	26,987	85.8	0.69
55-59 .....	509,313	90.2	45,293	87.2	0.62
60-64 .....	782,502	88.0	71,561	92.1	0.62
65-69 .....	890,071	82.7	80,006	92.4	0.60
70-74 .....	939,969	85.1	90,910	95.0	0.59
75-79 .....	889,918	86.3	96,488	87.6	0.58
80-84 .....	701,373	88.6	95,294	88.2	0.65
85-89 .....	393,835	89.3	60,726	83.6	0.67
90-95 .....	171,533	95.3	38,080	108.1	0.84
All Ages .....	\$5,894,790	87.0%	\$651,298	89.7%	0.63

The latest prior individual life experience studies, for various items, are in the following *TSA Reports*:

<u>Study</u>	<u>TSA Reports No.</u>
Standard Ordinary	1995-96
Cause of Death	1995-96
Large Amounts	1985-86-87
Term Conversions	1982
Guaranteed Insurability Option	1982
Substandard	1979
Group Conversions	1979
Waiver of Premium	1978
Accidental Death Benefits	1977

