

## II. MORTALITY ON POLICIES FOR LARGE AMOUNTS

**T**HIS report presents the findings of the latest in a series of inter-company studies of the mortality on policies for large amounts. The current study includes the experience on issues of 1934 through 1957 from 1953 to 1958 anniversaries. The last previous study, published in *TSA* 1954 Reports, 20-35, covered the experience on issues of 1934 through 1952 observed from 1948 to 1953 anniversaries. The report on that study listed the volumes of *TASA* and *TSA* in which earlier studies were published.

The experience covered in this report is based on a total exposure of \$43,124,433,000 (almost double that in the last previous study) and actual claims amounting to \$201,295,000 on 2,959 lives. No war deaths under policies for large amounts were reported during the study period.

The study is by amounts of insurance on a select policy year basis. The basic requirement for inclusion of a policy is that it shall be the result of one or more applications to a contributing company for a total of at least \$50,000 on a life during a 90-day period, and that the "classification amount," as defined in the instructions, shall be at least \$50,000. The instructions were published in the Appendix to the 1949 Reports (*TSA* I 602-605). They were changed in 1950 to request inclusion of group insurance in the "classification amount" where this could conveniently be done. For the present study the contributing companies were requested to subdivide their experience by sex. In addition, a subdivision into policies with and without a decreasing term element was introduced. Policies having a base plan of permanent insurance with a decreasing term or family income rider, as well as pure decreasing term plans, were classified as having a decreasing term element. For example, a whole life policy with a decreasing term rider was treated as a permanent plan with a decreasing term element. The plan and amount classification at the time of original issue was retained during the life of the policy.

In previous studies the expected deaths were calculated by use of the ungraduated rates of mortality for corresponding issue ages, years of issue, and periods of exposure, derived from the Committee's annual reports on the mortality under standard Ordinary medically examined issues for all amounts. Since these reports do not provide data for policy years 16-24, a special select table was constructed for the current study to serve as the basis of expected deaths at all durations. This table is considered a satisfactory measure of the mortality on standard Ordinary medically ex-

amined issues for all amounts during the 1953–1958 period. The table, together with a brief description of its construction, is shown in Table E of the Appendix.

The names of the nineteen companies contributing to the experience, and their proportionate contributions to the exposure in this study, are given in Table A of the Appendix. As in the earlier studies, slightly more than 90% of the exposure in the present investigation was submitted by the sixteen companies which contribute to the annual studies of mortality on standard Ordinary medically examined issues, but there are differences in the relative proportions of the experience contributed by the companies to the two investigations. Since the level of mortality varies between companies, the basis of expected deaths differs slightly from what it would have been if each company's experience on standard Ordinary medically examined issues for all amounts had been weighted in proportion to its contribution to the study of policies for large amounts. It is estimated that if this had been done, the mortality ratio on policies for large amounts would have been about one and one-half percentage points higher in the aggregate. Female lives accounted for a slightly smaller proportion of the experience for large amounts than of that for all amounts, but the effect of this difference was negligible.

Seventeen companies submitted their entire experience separately for males and females, and one company submitted a portion of its experience in this manner. The data subdivided by sex represent 91% of the total exposure on permanent plans and 92% of the total exposure on term plans. Only twelve companies were able to subdivide their contribution according to the presence or absence of a decreasing term element, while four companies did so for part of their contribution. The data entering this portion of the investigation comprise 73% of the total exposure on permanent plans, and 80% of the total exposure on term plans.

#### EXPERIENCE BY AGE AT ISSUE, DURATION, CLASSIFICATION AMOUNT AND PLAN OF INSURANCE

The results of the experience by age at issue and plan are summarized in Table 1, those by policy year duration and plan in Table 2, and those by classification amount and plan in Table 3. The number of lives terminated by death is shown in parentheses after the amount of actual claims; duplications have been eliminated in arriving at the number of deaths for all plans combined, for all ages at issue combined, for all policy years combined, and for all classification amounts combined.

Part A of each of Tables 1, 2, and 3 presents all data entering this study, without subdivision by sex or decreasing term element. Parts B and

E of these tables show the experience separately for males and females, respectively, without analysis by decreasing term classification. Since not all companies were able to subdivide their experience by sex, the total of the claims shown in Parts B and E is less than the corresponding figures in Part A. In Parts C and D of these tables, the experience on male lives is presented separately for policies without and with a decreasing term element. Here, too, some of the experience included in Part B is not subdivided in Parts C and D. Since virtually none of the policies on women had a decreasing term element, no analysis of the experience on female lives according to decreasing term classification is shown.

The main features of the experience are summarized below.

#### *All Data*

1. The aggregate mortality on permanent plans was significantly lower, at the 95% confidence level, than the experience on standard Ordinary medically examined issues for all amounts of insurance. The mortality on term plans was significantly higher than that experience. It should be noted that the expected claims are based on the experience under all plans of insurance combined.
2. Except for ages 10–19, mortality ratios decreased with advancing age at issue for both permanent and term plans. On permanent plans the ratios were below 100% at all ages and were significantly low at issue ages 50 and over, where selection of risks for large amounts is particularly careful. Term plans, on the other hand, exhibited mortality ratios greater than 100% in all age groups where there were at least 10 deaths.
3. There was no trend in the mortality ratios by duration. The unusually low ratio for durations 1–2 on permanent plans is statistically significant; this feature was present for all issue ages, as may be seen in Table B of the Appendix. Term plans did not show favorable mortality at any duration; no doubt the ratios after the first five policy years reflect anti-selection at renewal or conversion.
4. For permanent plans, the mortality for classification amounts of \$200,000 and over was distinctly lower than for classification amounts of less than \$200,000. Mortality on term plans showed no clear trend by classification amount; excess mortality was present in all amount groups where there were at least 10 deaths.

#### *Experience by Sex*

1. Since policies issued to males comprised the bulk of the study, the experience on male lives closely paralleled the experience on all data. The comments made above for all data therefore apply to the male mortality results as well.

TABLE 1  
LARGE AMOUNT ISSUES OF 1934 TO 1957  
EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
BY AGE AT ISSUE AND PLAN OF INSURANCE  
Expected Deaths Based on Corresponding Standard  
Ordinary Medical Issues Experience  
(Amounts Shown in \$1,000 Units)

AGES AT ISSUE	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio
A. Male and Female Lives, with and without Decreasing Term Element									
10-19.....	\$ 580 (12)	\$ 679	85%	\$ 0 (0)	\$ 4	*	\$ 580 (12)	\$ 683	85%
20-29.....	3,983 (78)	4,072	98	800 (18)	508	157%	4,783 (92)	4,580	104
30-39.....	29,389 (496)	30,408	97	7,705 (139)	5,536	139	37,094 (592)	35,944	103
40-49.....	68,999 (1,053)	75,458	91	17,738 (351)	14,437	123	86,737 (1,326)	89,895	96
50-59.....	53,044 (832)	63,763	83	9,075 (143)	8,297	109	62,119 (935)	72,060	86
60 and over.....	9,807 (171)	12,411	79	175 (5)	351	*	9,982 (175)	12,762	78
All.....	\$165,802 (2,511)	\$186,791	89%	\$35,493 (638)	\$29,134	122%	\$201,295 (2,959)	\$215,924	93%
B. Male Lives, with and without Decreasing Term Element									
10-19.....	\$ 265 (7)	\$ 438	*	\$ 0 (0)	\$ 4	*	\$ 265 (7)	\$ 442	*
20-29.....	3,262 (66)	3,183	102%	710 (17)	449	158%	3,972 (79)	3,632	109%
30-39.....	25,179 (430)	25,403	99	5,988 (109)	4,969	121	31,167 (504)	30,372	103
40-49.....	58,048 (925)	62,080	94	14,853 (287)	12,995	114	72,901 (1,146)	75,075	97
50-59.....	44,165 (709)	51,251	86	8,171 (125)	7,530	109	52,336 (801)	58,781	89
60 and over.....	7,701 (137)	9,985	77	115 (4)	327	*	7,816 (140)	10,312	76
All.....	\$138,620 (2,163)	\$152,340	91%	\$29,837 (528)	\$26,274	114%	\$168,457 (2,505)	\$178,614	94%

TABLE 1—Continued

AGES AT ISSUE	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio
C. Male Lives, without Decreasing Term Element									
10-19.....	\$ 220 (5)	\$ 360	*	\$ 0 (0)	\$ 4	*	\$ 220 (5)	\$ 364	*
20-29.....	2,122 (43)	2,298	92%	590 (13)	381	155%	2,712 (55)	2,679	101%
30-39.....	17,988 (292)	18,272	98	4,950 (89)	4,215	117	22,938 (359)	22,487	102
40-49.....	45,905 (697)	46,825	98	12,821 (241)	10,915	117	58,726 (888)	57,740	102
50-59.....	34,047 (523)	39,449	86	6,308 (97)	6,173	102	40,355 (597)	45,622	88
60 and over....	5,367 (99)	7,620	70	115 (4)	315	*	5,482 (102)	7,935	69
All.....	\$105,649 (1,580)	\$114,824	92%	\$24,784 (432)	\$22,003	113%	\$130,433 (1,901)	\$136,827	95%
D. Male Lives, with Decreasing Term Element									
10-19.....	\$ 0 (0)	\$ 0	*	\$ 0 (0)	\$ 0	*	\$ 0 (0)	\$ 0	*
20-29.....	395 (14)	214	185%	10 (1)	16	*	405 (14)	230	176%
30-39.....	1,600 (51)	1,799	89	106 (4)	144	*	1,706 (55)	1,943	88
40-49.....	688 (21)	1,424	48	179 (5)	215	*	867 (26)	1,639	53
50-59.....	111 (3)	204	*	102 (2)	75	*	213 (5)	279	*
60 and over....	0 (0)	2	*	0 (0)	0	*	0 (0)	2	*
All.....	\$ 2,794 (88)	\$ 3,643	77%	\$ 397 (12)	\$ 450	88%	\$ 3,191 (99)	\$ 4,093	78%
E. Female Lives, with and without Decreasing Term Element									
10-19.....	\$ 215 (3)	\$ 178	*	\$ 0 (0)	\$ 0	*	\$ 215 (3)	\$ 178	*
20-29.....	379 (6)	472	*	0 (0)	15	*	379 (6)	487	*
30-39.....	1,298 (23)	1,995	65%	50 (1)	109	*	1,348 (24)	2,104	64%
40-49.....	2,586 (41)	5,297	49	330 (6)	274	*	2,916 (47)	5,571	52
50-59.....	3,446 (52)	6,180	56	75 (1)	186	*	3,521 (53)	6,366	55
60 and over....	1,260 (22)	1,733	73	0 (0)	2	*	1,260 (22)	1,735	73
All.....	\$ 9,184 (147)	\$ 15,855	58%	\$ 455 (8)	\$ 586	*	\$ 9,639 (152)	\$ 16,441	59%

\* Less than 10 lives terminated by death.

† Number of lives involved shown in parentheses.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE 2  
LARGE AMOUNT ISSUES OF 1934 TO 1957  
EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
BY DURATION AND PLAN OF INSURANCE  
Expected Deaths Based on Corresponding Standard  
Ordinary Medical Issues Experience  
(Amounts Shown in \$1,000 Units)

POLICY YEARS	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mortality Ratio	Actual Claims†	Expected Claims	Mortality Ratio	Actual Claims†	Expected Claims	Mortality Ratio
A. Male and Female Lives, with and without Decreasing Term Element									
1- 2 .....	\$ 14,499 (256)	\$ 19,378	75%	\$ 6,026 (94)	\$ 4,760	127%	\$ 20,525 (339)	\$ 24,138	85%
3- 5 .....	27,086 (439)	30,450	89	7,805 (137)	6,794	115	34,891 (549)	37,244	94
6-10 .....	42,861 (663)	44,374	97	9,550 (180)	7,521	127	52,411 (799)	51,895	101
11-15 .....	32,056 (555)	37,260	86	4,687 (103)	4,256	110	36,743 (629)	41,516	89
16-20 .....	36,171 (590)	38,440	94	5,238 (105)	4,210	124	41,409 (673)	42,650	97
21-24 .....	13,129 (260)	16,889	78	2,187 (55)	1,592	137	15,316 (300)	18,481	83
All .....	\$165,802(2,511)	\$186,791	89%	\$35,493 (638)	\$29,133	122%	\$201,295 (2,959)	\$215,924	93%
B. Male Lives, with and without Decreasing Term Element									
1- 2 .....	\$ 12,778 (231)	\$ 16,689	77%	\$ 5,650 (86)	\$ 4,319	131%	\$ 18,428 (308)	\$ 21,008	88%
3- 5 .....	22,680 (369)	25,312	90	6,746 (116)	6,055	111	29,426 (461)	31,367	94
6-10 .....	35,708 (570)	36,180	99	7,738 (141)	6,691	116	43,446 (676)	42,871	101
11-15 .....	27,777 (487)	30,563	91	3,904 (86)	3,878	101	31,681 (546)	34,441	92
16-20 .....	29,021 (497)	30,600	95	4,120 (88)	3,885	106	33,141 (566)	34,485	96
21-24 .....	10,656 (217)	12,996	82	1,679 (45)	1,446	116	12,335 (250)	14,442	85
All .....	\$138,620 (2,163)	\$152,340	91%	\$29,837 (528)	\$26,274	114%	\$168,457(2,505)	\$178,614	94%

TABLE 2—Continued

POLICY YEARS	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mortality Ratio	Actual Claims†	Expected Claims	Mortality Ratio	Actual Claims†	Expected Claims	Mortality Ratio
C. Male Lives, without Decreasing Term Element									
1- 2 .....	\$ 10,393 (177)	\$ 12,646	82%	\$ 4,590 (73)	\$ 3,544	130%	\$ 14,983 (243)	\$ 16,190	93%
3- 5 .....	16,522 (267)	19,307	86	5,734 (94)	5,028	114	22,256 (345)	24,335	91
6-10 .....	28,083 (416)	27,482	102	6,136 (113)	5,584	110	34,219 (510)	33,066	103
11-15 .....	21,076 (355)	22,975	92	3,239 (71)	3,382	96	24,315 (405)	26,357	92
16-20 .....	22,230 (369)	23,022	97	3,681 (77)	3,256	113	25,911 (430)	26,278	99
21-24 .....	7,345 (142)	9,392	78	1,404 (33)	1,209	116	8,749 (167)	10,601	83
All .....	\$105,649 (1,580)	\$114,824	92%	\$24,784 (432)	\$22,003	113%	\$130,433(1,901)	\$136,827	95%
D. Male Lives, with Decreasing Term Element									
1- 2 .....	\$ 526 (20)	\$ 1,011	52%	\$ 115 (3)	\$ 174	*	\$ 641 (23)	\$ 1,185	54%
3- 5 .....	1,119 (32)	1,232	91	202 (5)	150	*	1,321 (37)	1,382	96
6-10 .....	716 (22)	913	78	52 (3)	91	*	768 (24)	1,004	76
11-15 .....	199 (5)	255	*	28 (1)	25	*	227 (6)	280	*
16-20 .....	110 (4)	134	*	0 (0)	10	*	110 (4)	144	*
21-24 .....	124 (5)	98	*	0 (0)	0	*	124 (5)	98	*
All .....	\$ 2,794 (88)	\$ 3,643	77%	\$ 397 (12)	\$ 450	88%	\$ 3,191 (99)	\$ 4,093	78%
E. Female Lives, with and without Decreasing Term Element									
1- 2 .....	\$ 726 (11)	\$ 1,544	47%	\$ 50 (1)	\$ 131	*	\$ 776 (12)	\$ 1,675	46%
3- 5 .....	1,263 (23)	2,353	54	225 (4)	174	*	1,488 (27)	2,527	59
6-10 .....	1,421 (23)	2,827	50	180 (3)	139	*	1,601 (26)	2,966	54
11-15 .....	1,435 (27)	2,782	52	0 (0)	71	*	1,435 (27)	2,853	50
16-20 .....	3,321 (50)	4,440	75	0 (0)	55	*	3,321 (50)	4,495	74
21-24 .....	1,018 (16)	1,909	53	0 (0)	16	*	1,018 (16)	1,925	53
All .....	\$ 9,184 (147)	\$ 15,855	58%	\$ 455 (8)	\$ 586	*	\$ 9,639 (152)	\$ 16,441	59%

\* Less than 10 lives terminated by death.

† Number of lives involved shown in parentheses.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE 3  
 LARGE AMOUNT ISSUES OF 1934 TO 1957  
 EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
 BY CLASSIFICATION AMOUNT AND PLAN OF INSURANCE  
 Expected Deaths Based on Corresponding Standard  
 Ordinary Medical Issues Experience  
 (Amounts Shown in \$1,000 Units)

CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio
A. Male and Female Lives, with and without Decreasing Term Element									
\$ 50,000- 99,999....	\$ 40,271 (1,016)	\$ 43,872	92%	\$ 9,473 (257)	\$ 1,773	122%	\$ 49,744 (1,235)	\$ 51,645	96%
100,000-199,999....	66,195 (1,164)	70,655	94	14,272 (283)	11,972	119	80,467 (1,376)	82,627	97
200,000-499,999....	44,648 (499)	52,565	85	8,907 (113)	7,110	125	53,555 (568)	59,675	90
500,000-999,999....	9,929 (78)	13,731	72	2,436 (16)	1,694	144	12,365 (89)	15,425	80
1,000,000 and over....	4,759 (22)	5,968	80	405 (4)	584	*	5,164 (24)	6,552	79
All .....	\$165,802 (2,511)	\$186,791	89%	\$35,493 (638)	\$29,133	122%	\$201,295 (2,959)	\$215,924	93%
B. Male Lives, with and without Decreasing Term Element									
\$ 50,000- 99,999....	\$ 33,410 (856)	\$ 34,209	98%	\$ 7,762 (213)	\$ 6,992	111%	\$ 41,172 (1,035)	\$ 41,201	100%
100,000-199,999....	55,084 (1,000)	58,412	94	11,930 (236)	10,695	112	67,014 (1,177)	69,107	97
200,000-499,999....	38,055 (427)	43,888	87	7,474 (93)	6,512	115	45,529 (486)	50,400	90
500,000-999,999....	8,212 (70)	11,107	74	2,266 (13)	1,573	144	10,478 (79)	12,680	83
1,000,000 and over....	3,859 (21)	4,724	82	405 (4)	502	*	4,264 (23)	5,226	82
All .....	\$138,620 (2,163)	\$152,340	91%	\$29,837 (528)	\$26,274	114%	\$168,457 (2,505)	\$178,614	94%



TABLE 3—Continued

CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio	Actual Claims†	Expected Claims	Mor- tality Ratio
C. Male Lives, without Decreasing Term Element									
\$ 50,000- 99,999....	\$ 22,061 (553)	\$ 23,521	94%	\$ 6,381 (168)	\$ 5,823	110%	\$ 28,442 (701)	\$ 29,344	97%
100,000-199,999....	42,425 (753)	43,772	97	9,828 (193)	8,847	111	52,253 (905)	52,619	99
200,000-499,999....	31,309 (344)	34,950	90	6,254 (79)	5,486	114	37,563 (397)	40,436	93
500,000-999,999....	6,877 (59)	8,725	79	1,916 (13)	1,440	133	8,793 (68)	10,165	87
1,000,000 and over....	2,977 (19)	3,856	77	405 (4)	407	*	3,382 (21)	4,263	79
All.....	\$105,649(1,580)	\$114,824	92%	\$24,784(432)	\$22,003	113%	\$130,433(1,901)	\$136,827	95%
D. Male Lives, with Decreasing Term Element									
\$ 50,000- 99,999....	\$ 1,805 (60)	\$ 2,035	89%	\$ 169 (6)	\$ 171	*	\$ 1,974 (65)	\$ 2,206	89%
100,000-199,999....	834 (28)	1,359	61	143 (4)	207	*	977 (32)	1,566	62
200,000-499,999....	155 (3)	225	*	85 (2)	60	*	240 (5)	285	*
500,000-999,999....	0 (0)	22	*	0 (0)	8	*	0 (0)	30	*
1,000,000 and over....	0 (0)	2	*	0 (0)	4	*	0 (0)	6	*
All.....	\$ 2,794 (88)	\$ 3,643	77%	\$ 397 (12)	\$ 450	88%	\$ 3,191 (99)	\$ 4,093	78%
E. Female Lives, with and without Decreasing Term Element									
\$ 50,000- 99,999....	\$ 3,257 (73)	\$ 5,862	56%	\$ 305 (6)	\$ 230	*	\$ 3,562 (79)	\$ 6,092	58%
100,000-199,999....	4,285 (65)	5,432	79	150 (3)	230	*	4,435 (68)	5,662	78
200,000-499,999....	1,642 (19)	3,138	52	0 (0)	85	*	1,642 (19)	3,223	51
500,000-999,999....	0 (0)	871	*	0 (0)	25	*	0 (0)	896	*
1,000,000 and over....	0 (0)	552	*	0 (0)	16	*	0 (0)	568	*
All.....	\$ 9,184 (147)	\$ 15,855	58%	\$ 455 (8)	\$ 586	*	\$ 9,639 (152)	\$ 16,441	59%

\* Less than 10 lives terminated by death.

† Number of lives involved shown in parentheses.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

The aggregate mortality ratio of 114% for term policies on male lives was considerably lower than the ratio of 122% shown for term policies on all lives entering the study. This is so because the two companies which were unable to subdivide their contribution by sex experienced unusually high mortality on their term plans (the mortality ratio was 229%, based on actual claims of \$5,201,000).

2. In interpreting the ratios for female lives, it must be kept in mind that they are based on a combined table representing mostly male lives. In the aggregate, female mortality was 63% of that of males. The ratios of female to male mortality for the various age groups were higher, particularly at issue ages 50 and over, than in the experience on standard Ordinary medically examined issues for all amounts during the first 15 policy years between 1955 and 1958 policy anniversaries. The lowest mortality ratio on permanent plans was experienced at durations 1-2 for females as well as for males.

#### *Experience on Male Lives by Decreasing Term Classification*

The volume of data on policies with a decreasing term element was scant, and most of it was on permanent plans. Mortality on such permanent plan policies was generally lower than on policies providing a level amount of protection; the difference was greatest for classification amounts of \$100,000-\$199,999. Thus the antiselection presumably responsible for the excess mortality on level term plans appears to be absent in policies with a decreasing term element.

Tables B, C, and D of the Appendix present details of the experience covered in the present study by age at issue and policy year duration, by age at issue and classification amount, and by policy year duration and classification amount, each by plan of insurance (but without subdivision by sex or decreasing term element).

#### COMPARISON WITH PREVIOUS EXPERIENCE

A comparison of the experience between 1953 and 1958 anniversaries with earlier studies is given in Table 4. The ratios shown for each period are relative to the mortality on standard Ordinary medically examined issues for all amounts in that period. The main features of the comparison may be summarized as follows:

1. There has been little change in the aggregate mortality ratio on permanent plans during the twenty-four years covered by the table; the ratio rose from 85% in 1934-41 to 89% in 1953-58.
2. Mortality on term plans has been substantially higher than on per-

TABLE 4

COMPARISON OF MORTALITY RATIOS ON LARGE AMOUNT ISSUES OF 1934 TO 1957  
 EXPERIENCE BETWEEN 1934-41, 1941-48, 1948-53, AND 1953-58 ANNIVERSARIES  
 BY AGE AT ISSUE, DURATION, CLASSIFICATION AMOUNT AND PLAN OF INSURANCE  
 Expected Deaths Based on Corresponding Standard  
 Ordinary Medical Issues Experience

	PERMANENT PLANS				TERM PLANS				ALL PLANS			
	1934-41	1941-48	1948-53	1953-58	1934-41	1941-48	1948-53	1953-58	1934-41	1941-48	1948-53	1953-58
<i>Ages at Issue</i>												
10-39.....	80%	100%	110%	97%	168%	168%	107%	141%	93%	108%	109%	103%
40-49.....	73	89	90	91	114	107	94	123	81	92	90	96
50 and over.....	95	78	78	83	107	91	72	107	96	79	77	85
All.....	85%	86%	88%	89%	119%	112%	90%	122%	90%	89%	88%	93%
<i>Policy Years</i>												
1-2.....	†	90%	98%	75%	†	81%	83%	127%	†	89%	95%	85%
3-5.....	†	95	98	89	†	139	103	115	†	101	99	94
6-10.....	†	84	90	97	†	109	82	127	†	87	89	101
11 and over.....	†	78	82	88	†	105	91	120	†	80	83	91
All.....	†	86%	88%	89%	†	112%	90%	122%	†	89%	88%	93%
<i>Classification Amount</i>												
\$ 50,000-\$ 99,999.....	†	91%	89%	92%	†	118%	104%	122%	84%	95%	91%	96%
100,000-199,999.....	†	90	85	94	†	100	86	119	104	91	85	97
200,000-499,999.....	†	89	94	85	†	128	80	125	88	93	92	90
500,000 and over.....	†	61	80	75	†	94	*	125	72	64	81	80
All.....	†	86%	88%	89%	†	112%	90%	122%	90%	89%	88%	93%

\* Less than 10 lives terminated by death.

† Not available.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE 5  
LARGE AMOUNT ISSUES OF 1934 TO 1957  
EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
BY CAUSE OF DEATH

Expected Deaths Based on Corresponding Standard  
Ordinary Medical Issues Experience†  
(Amounts Shown in \$1,000 Units)

Cause of Death	Committee 1950 Code	Number of Lives Who Died	Proportion of All Deaths	Actual Claims	Expected Claims	Ratio of Actual to Ex- pected
PERMANENT PLANS						
Tuberculosis (all forms)	01, 02	2	0%	\$ 90	\$ 444	*
Malignant neoplasms...	18-33	518	21	38,487	39,042	99%
Diabetes mellitus.....	37	10	0	475	1,054	45
Vascular lesions of central nervous system...	42	188	7	11,817	11,241	105
Diseases of the heart and circulatory system...	49-55	1,173	47	75,921	89,520	85
Pneumonia and influenza.....	56-59	21	1	1,255	2,089	60
Accidents and homicide.	88-96, 98	226	9	15,923	13,815	115
Suicide.....	97	91	4	5,293	5,224	101
All other causes and Unknown.....	Residual	282	11	16,541	24,362	68
All Causes.....		2,511	100%	\$165,802	\$186,791	89%
TERM PLANS						
Tuberculosis (all forms)	01, 02	0	0%	\$ 0	\$ 63	*
Malignant neoplasms...	18-33	111	17	6,430	6,099	105%
Diabetes mellitus.....	37	0	0	0	122	*
Vascular lesions of central nervous system...	42	34	5	1,701	1,468	116
Diseases of the heart and circulatory system...	49-55	327	52	17,992	13,672	132
Pneumonia and influenza.....	56-59	6	1	698	303	*
Accidents and homicide.	88-96, 98	63	10	3,781	2,720	139
Suicide.....	97	32	5	1,525	931	164
All other causes and Unknown.....	Residual	65	10	3,366	3,755	90
All Causes.....		638	100%	\$ 35,493	\$ 29,133	122%

\* Less than 10 lives terminated by death.

† Distribution of expected deaths by cause based on 1953-1958 experience.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE 5—*Continued*

Cause of Death	Committee 1950 Code	Number of Lives Who Died	Proportion of All Deaths	Actual Claims	Expected Claims	Ratio of Actual to Ex- pected
ALL PLANS						
Tuberculosis (all forms)	01, 02	2	0%	\$ 90	\$ 507	*
Malignant neoplasms...	18-33	597	20	44,917	45,141	100%
Diabetes mellitus.....	37	10	0	475	1,176	40
Vascular lesions of central nervous system..	42	212	7	13,518	12,709	106
Diseases of the heart and circulatory system...	49-55	1,403	48	93,913	103,192	91
Pneumonia and influenza.....	56-59	27	1	1,953	2,392	82
Accidents and homicide.	88-96, 98	271	9	19,704	16,535	119
Suicide.....	97	110	4	6,818	6,155	111
All other causes and Unknown.....	Residual	327	11	19,907	28,117	71
All Causes.....		2,959	100%	\$201,295	\$215,924	93%

manent plans in every period except 1948-53. Excess term mortality has been evident in all issue age groups.

3. Except for permanent plans in 1934-41, the mortality ratios have decreased with issue age group in all periods for both permanent and term plans.
4. In previous periods mortality ratios on permanent plans were highest in the first five policy years, but this was not true of the latest period.
5. On permanent plans, policies with classification amounts of \$500,000 and over have consistently produced the lowest mortality. Though data are scant, this does not appear to be true of term plans.

#### EXPERIENCE BY CAUSE OF DEATH

An analysis by cause of death of the claims entering the present investigation is presented in Table 5. The distribution of expected deaths by cause was calculated on the basis of the corresponding distribution on standard Ordinary medically examined issues for all amounts during the period between 1953 and 1958 anniversaries. For policy years beyond the 15th, the expected distribution was derived from the ultimate experience (policy years 16 and over combined) at the corresponding attained ages, for the same period of observation.

Confirming previous experience, accidents and homicide again ac-

counted for significantly higher mortality on policies for large amounts than on standard Ordinary medically examined issues for all amounts. Excess mortality from these causes was present for both permanent and term plans, and in all issue age groups under 60. Suicides also produced a high ratio for term plans. Of the 271 deaths from accidents and homicide, 123 (45% of the total) were due to motor vehicle accidents and 47 (17% of the total) were due to aircraft accidents. In the last study the corresponding percentages were 35% and 23%.

As in previous studies, mortality from diseases of the heart and circulatory system was significantly below 100% for permanent plans. For term plans, on the other hand, the ratio of actual to expected claims for these diseases was well above 100%; they accounted for more than two-thirds of the excess deaths on term plans. For both permanent and term plans, the pattern of mortality ratios decreasing with age at issue, which was noted in Table 1, was due to the experience with diseases of the heart and circulatory system.

## APPENDIX

TABLE A  
CONTRIBUTING COMPANIES

Company	Proportion of Permanent Insurance Exposures	Proportion of Term Insurance Exposures	Proportion of Total Exposures
Northwestern Mutual.....	12.2%	8.6%	11.5%
Equitable, New York.....	9.7	6.7	9.2
New York Life.....	9.7	5.6	9.0
Prudential.....	8.2	10.4	8.6
Metropolitan.....	5.7	17.2	7.7
Mutual Benefit.....	9.0	1.1	7.6
Massachusetts Mutual.....	7.4	6.8	7.3
Connecticut Mutual.....	5.2	6.6	5.4
New England Mutual.....	5.6	3.4	5.2
John Hancock.....	5.1	4.0	4.9
Connecticut General.....	3.4	7.0	4.1
Aetna.....	3.2	5.6	3.6
Mutual Life, New York.....	3.2	5.2	3.6
Travelers.....	2.8	5.8	3.4
Penn Mutual.....	3.5	1.8	3.2
Provident Mutual.....	2.3	1.5	2.1
Phoenix Mutual.....	1.3	1.2	1.3
Sun Life, Canada.....	1.4	1.1	1.3
Canada Life.....	1.1	.4	1.0
Total.....	100.0%	100.0%	100.0%

TABLE B

LARGE AMOUNT ISSUES OF 1934 TO 1957

EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES

BY AGE AT ISSUE, DURATION, AND PLAN OF INSURANCE

Expected Deaths Based on Corresponding Standard  
Ordinary Medical Issues Experience

(Amounts Shown in \$1,000 Units)

AGES AT ISSUE	POL- ICY YEARS	PERMANENT PLANS			TERM PLANS			ALL PLANS		
		Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio
10-19.....	1- 2	\$ 60	\$ 110	*	\$ 0	\$ 2	*	\$ 60	\$ 112	*
	3- 5	110	168	*	0	1	*	110	169	*
	6-10	235	205	*	0	1	*	235	206	*
	11-15	50	90	*	0	0	*	50	90	*
	16-20	125	71	*	0	0	*	125	71	*
	21-24	0	35	*	0	0	*	0	35	*
	All	\$ 580	\$ 679	85%	\$ 0	\$ 4	*	\$ 580	\$ 683	85%
20-29.....	1- 2	\$ 374	\$ 627	60%	\$ 190	\$ 145	*	\$ 564	\$ 772	73%
	3- 5	1,331	743	179	105	140	*	1,436	883	163
	6-10	682	862	79	150	106	*	832	968	86
	11-15	380	506	*	81	34	*	461	540	*
	16-20	700	913	77	274	67	*	974	980	99
	21-24	516	421	123	0	16	*	516	437	118
	All	\$ 3,983	\$ 4,072	98%	\$ 800	\$ 508	157%	\$ 4,783	\$ 4,580	104%
30-39.....	1- 2	\$ 3,283	\$ 3,713	88%	\$ 1,847	\$ 1,084	170%	\$ 5,130	\$ 4,797	107%
	3- 5	5,587	4,933	113	1,380	1,316	105	6,967	6,249	111
	6-10	6,207	6,956	89	2,284	1,401	163	8,491	8,357	102
	11-15	5,774	5,401	107	831	749	111	6,605	6,150	107
	16-20	6,364	6,321	101	860	712	121	7,224	7,033	103
	21-24	2,174	3,084	70	503	274	184	2,677	3,358	80
	All	\$ 29,389	\$ 30,408	97%	\$ 7,705	\$ 5,536	139%	\$ 37,094	\$ 35,944	103%
40-49.....	1- 2	\$ 4,793	\$ 6,976	69%	\$ 2,533	\$ 2,122	119%	\$ 7,326	\$ 9,098	81%
	3- 5	9,194	11,139	83	3,421	3,243	105	12,615	14,382	88
	6-10	18,258	17,926	102	4,563	3,723	123	22,821	21,649	105
	11-15	14,265	15,907	90	2,377	2,168	110	16,642	18,075	92
	16-20	16,358	16,483	99	3,535	2,301	154	19,893	18,784	106
	21-24	6,131	7,027	87	1,309	880	149	7,440	7,907	94
	All	\$ 68,999	\$ 75,458	91%	\$17,738	\$14,437	123%	\$ 86,737	\$ 89,895	96%
50-59.....	1- 2	\$ 4,524	\$ 5,948	76%	\$ 1,406	\$ 1,333	105%	\$ 5,930	\$ 7,281	81%
	3- 5	8,562	10,560	81	2,899	2,003	145	11,461	12,563	91
	6-10	15,507	15,751	98	2,468	2,189	113	17,975	17,940	100
	11-15	10,246	13,520	76	1,398	1,271	110	11,644	14,791	79
	16-20	10,747	12,515	86	549	1,081	51	11,296	13,596	83
	21-24	3,458	5,469	63	355	420	*	3,813	5,889	65
	All	\$ 53,044	\$ 63,763	83%	\$ 9,075	\$ 8,297	109%	\$ 62,119	\$ 72,060	86%
60 and over...	1- 2	\$ 1,465	\$ 2,004	73%	\$ 50	\$ 74	*	\$ 1,515	\$ 2,078	73%
	3- 5	2,302	2,907	79	0	91	*	2,302	2,998	77
	6-10	1,972	2,674	74	85	101	*	2,057	2,775	74
	11-15	1,341	1,836	73	0	34	*	1,341	1,870	72
	16-20	1,877	2,137	88	20	49	*	1,897	2,186	87
	21-24	850	853	100	20	2	*	870	855	102
	All	\$ 9,807	\$ 12,411	79%	\$ 175	\$ 351	*	\$ 9,982	\$ 12,762	78%
All.....	1- 2	\$ 14,499	\$ 19,378	75%	\$ 6,026	\$ 4,760	127%	\$ 20,525	\$ 24,138	85%
	3- 5	27,086	30,450	89	7,805	6,794	115	34,891	37,244	94
	6-10	42,861	44,374	97	9,550	7,521	127	52,411	51,895	101
	11-15	32,056	37,260	86	4,687	4,256	110	36,743	41,516	89
	16-20	36,171	38,440	94	5,238	4,210	124	41,409	42,650	97
	21-24	13,129	16,889	78	2,187	1,592	137	15,316	18,481	83
	All	\$165,802	\$186,791	89%	\$35,493	\$29,133	122%	\$201,295	\$215,924	93%

\* Less than 10 lives terminated by death.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE C  
LARGE AMOUNT ISSUES OF 1934 TO 1957  
EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
BY AGE AT ISSUE, CLASSIFICATION AMOUNT, AND PLAN OF INSURANCE  
Expected Deaths Based on Corresponding Standard Ordinary Medical Issues Experience  
(Amounts Shown in \$1,000 Units)

AGES AT ISSUE	CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
		Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio
10-19.....	\$ 50,000- 99,999	\$ 355	\$ 356	*	\$ 0	\$ 3	*	\$ 355	\$ 359	*
	100,000-199,999	125	238	*	0	1	*	125	239	*
	200,000-499,999	100	70	*	0	0	*	100	70	*
	500,000-999,999	0	10	*	0	0	*	0	10	*
	1,000,000 and over	0	5	*	0	0	*	0	5	*
	All	\$ 580	\$ 679	85%	\$ 0	\$ 4	*	\$ 580	\$ 683	85%
20-29.....	\$ 50,000- 99,999	\$ 1,846	\$ 1,608	115%	\$ 370	\$ 272	136%	\$ 2,216	\$ 1,880	118%
	100,000-199,999	1,388	1,536	90	300	168	*	1,688	1,704	99
	200,000-499,999	716	692	*	100	57	*	816	749	*
	500,000-999,999	33	169	*	0	6	*	33	175	*
	1,000,000 and over	0	67	*	30	5	*	30	72	*
	All	\$ 3,983	\$ 4,072	98%	\$ 800	\$ 508	157%	\$ 4,783	\$ 4,580	104%
30-39.....	\$ 50,000- 99,999	\$ 9,608	\$ 9,833	98%	\$ 2,422	\$ 2,142	113%	\$ 12,030	\$ 11,975	100%
	100,000-199,999	11,546	11,992	96	2,998	2,299	130	14,544	14,291	102
	200,000-499,999	6,908	6,592	105	1,785	913	196	8,693	7,505	116
	500,000-999,999	1,027	1,290	*	500	124	*	1,527	1,414	*
	1,000,000 and over	300	701	*	0	58	*	300	759	*
	All	\$ 29,389	\$ 30,408	97%	\$ 7,705	\$ 5,536	139%	\$ 37,094	\$ 35,944	103%



TABLE C—Continued

AGES AT ISSUE	CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
		Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio	Actual Claims	Expected Claims	Mor- tality Ratio
40-49.....	\$ 50,000- 99,999	\$ 14,737	\$ 17,165	86%	\$ 5,075	\$ 3,689	138%	\$ 19,812	\$ 20,854	95%
	100,000-199,999	27,976	29,627	94	7,293	6,171	118	35,269	35,798	99
	200,000-499,999	18,846	21,249	89	4,719	3,616	131	23,565	24,865	95
	500,000-999,999	5,413	5,320	102	651	750	*	6,064	6,070	100
	1,000,000 and over	2,027	2,097	*	0	211	*	2,027	2,308	*
	All	\$ 68,999	\$ 75,458	91%	\$17,738	\$14,437	123%	\$ 86,737	\$ 89,895	96%
50-59.....	\$ 50,000- 99,999	\$ 11,103	\$ 11,968	93%	\$ 1,586	\$ 1,631	97%	\$ 12,689	\$ 13,599	93%
	100,000-199,999	21,538	23,039	93	3,546	3,243	109	25,084	26,282	95
	200,000-499,999	15,137	20,189	75	2,283	2,403	95	17,420	22,592	77
	500,000-999,999	3,064	5,940	52	1,285	748	*	4,349	6,688	65
	1,000,000 and over	2,202	2,627	*	375	272	*	2,577	2,899	89
	All	\$ 53,044	\$ 63,763	83%	\$ 9,075	\$ 8,297	109%	\$ 62,119	\$ 72,060	86%
60 and over....	\$ 50,000- 99,999	\$ 2,622	\$ 2,942	89%	\$ 20	\$ 36	*	\$ 2,642	\$ 2,978	89%
	100,000-199,999	3,622	4,223	86	135	90	*	3,757	4,313	87
	200,000-499,999	2,941	3,773	78	20	121	*	2,961	3,894	76
	500,000-999,999	392	1,002	*	0	66	*	392	1,068	*
	1,000,000 and over	230	471	*	0	38	*	230	509	*
	All	\$ 9,807	\$ 12,411	79%	\$ 175	\$ 351	*	\$ 9,982	\$ 12,762	78%
All.....	\$ 50,000- 99,999	\$ 40,271	\$ 43,872	92%	\$ 9,473	\$ 7,773	122%	\$ 49,744	\$ 51,645	96%
	100,000-199,999	66,195	70,655	94	14,272	11,972	119	80,467	82,627	97
	200,000-499,999	44,648	52,565	85	8,907	7,110	125	53,555	59,675	90
	500,000-999,999	9,929	13,731	72	2,436	1,694	144	12,365	15,425	80
	1,000,000 and over	4,759	5,968	80	405	584	*	5,164	6,552	79
	All	\$165,802	\$186,791	89%	\$35,493	\$29,133	122%	\$201,295	\$215,924	93%

\* Less than 10 lives terminated by death.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE D  
LARGE AMOUNT ISSUES OF 1934 TO 1957  
EXPERIENCE BETWEEN 1953 AND 1958 ANNIVERSARIES  
BY DURATION, CLASSIFICATION AMOUNT, AND PLAN OF INSURANCE  
Expected Deaths Based on Corresponding Standard Ordinary Medical Issues Experience  
(Amounts Shown in \$1,000 Units)

POLICY YEARS	CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
		Actual Claims	Expected Claims	Mortality Ratio	Actual Claims	Expected Claims	Mortality Ratio	Actual Claims	Expected Claims	Mortality Ratio
1-2.....	\$ 50,000- 99,999	\$ 4,013	\$ 4,831	83%	\$ 1,955	\$ 1,371	143%	\$ 5,968	\$ 6,202	96%
	100,000-199,999	6,196	7,423	83	1,869	1,866	100	8,065	9,289	87
	200,000-499,999	4,021	4,862	83	1,302	1,019	128	5,323	5,881	91
	500,000-999,999	269	1,437	*	900	354	*	1,169	1,791	*
	1,000,000 and over	0	825	*	0	150	*	0	975	*
	All	\$ 14,499	\$ 19,378	75%	\$ 6,026	\$ 4,760	127%	\$ 20,525	\$ 24,138	85%
3-5.....	\$ 50,000- 99,999	\$ 7,579	\$ 7,879	96%	\$ 2,164	\$ 1,924	112%	\$ 9,743	\$ 9,804	99%
	100,000-199,999	12,229	11,494	106	2,708	2,722	99	14,937	14,216	105
	200,000-499,999	5,933	8,068	74	2,438	1,569	149	8,271	9,637	86
	500,000-999,999	1,345	2,011	67	540	407	*	1,885	2,418	78
	1,000,000 and over	0	998	*	55	172	*	55	1,170	*
	All	\$ 27,086	\$ 30,450	89%	\$ 7,805	\$ 6,794	115%	\$ 34,891	\$ 37,244	94%
6-10.....	\$ 50,000- 99,999	\$ 10,845	\$ 11,573	94%	\$ 2,909	\$ 2,105	138%	\$ 13,754	\$ 13,678	101%
	100,000-199,999	16,381	17,521	93	4,133	3,067	135	20,514	20,588	100
	200,000-499,999	11,322	11,652	97	2,033	1,745	117	13,355	13,397	100
	500,000-999,999	3,063	2,740	112	175	456	*	3,238	3,196	101
	1,000,000 and over	1,250	888	*	300	148	*	1,550	1,036	*
	All	\$ 42,861	\$ 44,374	97%	\$ 9,550	\$ 7,521	127%	\$ 52,411	\$ 51,895	101%

TABLE D—Continued

POLICY YEARS	CLASSIFICATION AMOUNT	PERMANENT PLANS			TERM PLANS			ALL PLANS		
		Actual Claims	Expected Claims	Mortality Ratio	Actual Claims	Expected Claims	Mortality Ratio	Actual Claims	Expected Claims	Mortality Ratio
11-15.....	\$ 50,000- 99,999	\$ 8,445	\$ 8,840	96%	\$ 1,136	\$ 1,096	104%	\$ 9,581	\$ 9,936	96%
	100,000-199,999	13,297	14,485	92	2,266	1,870	121	15,563	16,355	95
	200,000-499,999	8,283	10,454	79	955	1,016	94	9,238	11,470	81
	500,000-999,999	1,575	2,738	58	330	237	*	1,905	2,975	64
	1,000,000 and over	456	743	*	0	37	*	456	780	*
	All	\$ 32,056	\$ 37,260	86%	\$ 4,687	\$ 4,256	110%	\$ 36,743	\$ 41,516	89%
16-20.....	\$ 50,000- 99,999	\$ 7,134	\$ 7,624	94%	\$ 943	\$ 944	100%	\$ 8,077	\$ 8,568	94%
	100,000-199,999	13,207	14,020	94	2,553	1,810	141	15,760	15,830	100
	200,000-499,999	10,753	12,147	89	1,406	1,243	113	12,159	13,390	91
	500,000-999,999	2,349	3,173	74	286	166	*	2,635	3,339	79
	1,000,000 and over	2,728	1,476	185	50	47	*	2,778	1,523	182
	All	\$ 36,171	\$ 38,440	94%	\$ 5,238	\$ 4,210	124%	\$ 41,409	\$ 42,650	97%
21-24.....	\$ 50,000- 99,999	\$ 2,255	\$ 3,125	72%	\$ 366	\$ 333	110%	\$ 2,621	\$ 3,458	76%
	100,000-199,999	4,885	5,712	86	743	637	117	5,628	6,349	89
	200,000-499,999	4,336	5,382	81	873	518	169	5,209	5,900	88
	500,000-999,999	1,328	1,632	81	205	74	*	1,533	1,706	90
	1,000,000 and over	325	1,038	*	0	30	*	325	1,068	*
	All	\$ 13,129	\$ 16,889	78%	\$ 2,187	\$ 1,592	137%	\$ 15,316	\$ 18,481	83%
All.....	\$ 50,000- 99,999	\$ 40,271	\$ 43,872	92%	\$ 9,473	\$ 7,773	122%	\$ 49,744	\$ 51,645	96%
	100,000-199,999	66,195	70,655	94	14,272	11,972	119	80,467	82,627	97
	200,000-499,999	44,648	52,565	85	8,907	7,110	125	53,555	59,675	90
	500,000-999,999	9,929	13,731	72	2,436	1,694	144	12,365	15,425	80
	1,000,000 and over	4,759	5,968	80	405	584	*	5,164	6,552	79
	All	\$165,802	\$186,791	89%	\$35,493	\$29,133	122%	\$201,295	\$215,924	93%

\* Less than 10 lives terminated by death.

NOTE.—Mortality ratio in italics where less than 50 but not less than 10 lives terminated by death.

TABLE E  
MORTALITY TABLE USED TO CALCULATE EXPECTED DEATHS  
GRADUATED MORTALITY RATES PER \$1,000

POLICY YEAR	ISSUE AGES											
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 and over
1	.22	.61	.62	.49	.57	.88	1.31	2.05	2.86	4.15	6.07	8.31
2	.33	.73	.69	.62	.75	1.21	1.91	2.92	4.45	5.97	8.76	10.94
3	.47	.83	.76	.76	.91	1.52	2.44	3.83	5.81	8.31	12.08	13.49
4	.59	.88	.78	.82	1.00	1.73	2.76	4.47	6.74	10.00	14.53	15.37
5	.72	.92	.81	.88	1.13	2.05	3.21	5.27	8.06	11.83	16.97	18.31
6	.79	.93	.81	.91	1.27	2.34	3.67	6.05	9.38	13.11	19.03	21.69
7	.87	.93	.81	.95	1.45	2.58	4.09	6.76	10.38	14.15	21.30	26.53
8	.96	.94	.82	1.04	1.75	3.04	4.84	7.94	11.93	16.23	25.47	33.89
9	1.00	.97	.83	1.14	2.02	3.43	5.60	8.78	13.08	18.20	29.05	40.72
10	1.06	1.00	.87	1.27	2.32	3.89	6.39	9.77	14.21	20.81	32.32	48.26
11	1.06	1.04	.93	1.42	2.71	4.52	7.35	11.14	15.86	24.12	35.74	56.45
12	1.06	1.09	1.03	1.61	3.05	5.06	8.08	12.43	17.42	27.33	38.46	63.85
13	1.07	1.14	1.15	1.85	3.43	5.57	8.87	13.62	19.34	30.48	41.36	70.36
14	1.08	1.20	1.29	2.14	3.86	6.25	9.74	15.22	21.94	33.61	44.77	76.17
15	1.09	1.26	1.45	2.45	4.33	7.15	10.86	17.49	24.44	36.41	49.22	80.04
16	1.11	1.32	1.63	2.78	4.88	8.04	12.10	19.60	27.80	40.40	57.16	87.53
17	1.14	1.38	1.82	3.12	5.45	8.92	13.50	21.76	31.22	44.88	66.11	98.02
18	1.18	1.45	2.02	3.50	5.92	9.90	15.11	23.97	34.72	49.90	75.46	110.91
19	1.22	1.53	2.23	3.91	6.55	10.99	16.90	26.24	38.33	55.53	85.11	125.40
20	1.27	1.62	2.48	4.35	7.25	12.19	18.84	28.57	42.08	61.86	94.96	140.89
21	1.32	1.72	2.78	4.83	8.04	13.52	20.90	30.97	45.99	68.78	104.96	156.72
22	1.38	1.85	3.12	5.35	8.92	14.97	22.93	33.50	50.09	75.85	115.11	172.55
23	1.45	2.02	3.50	5.92	9.90	16.53	24.99	36.24	54.41	83.07	125.41	188.38
24	1.53	2.23	3.91	6.55	10.99	18.19	27.08	39.29	59.01	90.44	135.86	204.21

NOTE.—Table E was constructed as follows. For the first 15 policy years, mortality rates for each issue age group were calculated from the exposures and deaths in the Committee's annual reports on the mortality under standard Ordinary medically examined issues for all amounts for the period between 1953 and 1958 policy anniversaries. Since the current study covered experience for durations through the twenty-fourth policy year, and since no comparable data for the 1953-1958 period of observation were available for durations beyond the 15th policy year, it was necessary to extrapolate from the rates for the first 15 policy years to obtain mortality rates for policy years 16 through 24. As a guide in performing this extrapolation, use was made of the ultimate mortality rates for corresponding attained ages, obtained from the Committee's annual reports on the experience under standard Ordinary issues for all amounts during the 16th and subsequent policy years between 1953 and 1958 anniversaries.

Since accidental fluctuations in the ungraduated mortality rates might have had considerable effect on the choice of extrapolated values, both the mortality rates for durations 1-15 and the ultimate mortality rates were graduated. The graduation was made by use of the Whittaker-Henderson second difference A formula, with  $a = 1$ , applied to the ratios of (1) the ungraduated mortality rates to (2) the corresponding rates from the 1946-1949 Basic Tables (TSA II, 506-7). In graduating the select rates, each issue age group was treated separately. The constant  $a = 1$  was chosen to emphasize fit rather than smoothness.

In the extrapolation for durations 16 through 24, the graduated ultimate mortality rates for corresponding attained ages were used for issue ages under 40, with slight adjustments of the rates at durations 11-15 to form a reasonably smooth junction. For issue ages 40 and over, the rates projected for durations 16-24 are lower than the corresponding ultimate rates, though they approach the ultimate rates with advancing duration.

A few war deaths (probably delayed Korean deaths) were reported in the experience used as a basis for expected deaths; these were excluded in computing the expected mortality rates.