

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1979 REPORTS**

**V. GROUP CONVERSION MORTALITY AND LAPSE
EXPERIENCE BETWEEN 1967 AND 1977
POLICY ANNIVERSARIES**

SUMMARY

THIS report describes the results of an investigation of the mortality and lapse experience of life insurance policies issued as conversions from Group Life. As in previous studies, Group Conversion policies show considerable antiselection, although first-year mortality ratios are lower than in the last study.

SCOPE OF STUDY

The study covers the experience of fifteen contributing companies between 1967 and 1977 policy anniversaries. These fifteen companies contributed \$19.5 billion policy years of exposure to the select portion of the study (first twenty policy years) and \$1.4 billion policy years of exposure to the ultimate portion (policy years 21 and over). The last study of Group Conversions was published in *TSA, 1969 Reports*, pages 153-62, and covered the experience between 1959 and 1967 policy anniversaries.

Eight of the fifteen companies that contributed to the present study also contributed to the 1959-67 study; three of the eleven contributors to the earlier study were not able to contribute to this study, but there are seven new contributing companies. Two of the three companies unable to contribute to the current study write substantial amounts of group insurance, but the size of their contribution to the 1959-67 study is unknown; the seven new companies submitted about 15 percent of the total 1967-77 experience. The current study includes comments on the variation in experience by company; the previous study included such comments also.

The conversion policies included in the study are permanent policies issued without any health evidence. Policies rated substandard for other than health reasons (for example, occupation) have been excluded. Also excluded are conversions from the Federal Employees' and the Servicemen's Group Life Insurance plans, one-year preliminary term conversions, conversions from Group Paid-up or Group Permanent Insurance, conversions to monthly or weekly premium forms of insurance other than those classified as Ordinary insurance, and conversions that have been dated back.

TABLES

The results of the investigation are summarized in seven tables as follows:

Table	Description
1	Select Mortality Ratios by Policy Year, All Issue Ages Combined
2	Select Mortality Ratios by Policy Year and Issue-Age Group
3	Select Mortality Ratios for Each of First Five Policy Years, by Calendar Year of Issue
4	Select Mortality Ratios by Policy-Year Group, Issue-Age Group, and Sex
5	Ultimate Mortality Ratios by Attained-Age Group
6	Ultimate Mortality Ratios by Attained-Age Group and Sex
7	Select Lapse Rates by Policy-Year Group, Issue-Age Group, and Sex

All of the mortality ratios and lapse rates are based on amounts of insurance.

MORTALITY EXPERIENCE

Overall

Table 1 summarizes the select mortality experience for all issue ages combined. Ratios of actual to expected deaths based on the Commissioners 1958 Standard Ordinary Table are shown for the 1967-77 study along with corresponding ratios from the 1959-67 study.

Based on the 1958 CSO Table, the aggregate mortality ratio for the first twenty policy years is slightly lower than the corresponding ratio from the previous study—169 percent as opposed to 176 percent. Most of the reduction in mortality is in the first five policy years, with the ratio in the first policy year dropping from 350 percent to 275 percent.

When the results of the two studies are compared, it should be noted that ratios based on combined issue ages and combined policy years are affected by differences in age and policy-year distributions between the studies. It should also be noted that there was a substantial improvement in standard insured mortality from the period covered by the earlier study to that covered by the present study. At the midpoint in time of the earlier study, the overall mortality ratio for medically examined standard ordinary policies in the first fifteen policy years was 101 percent as measured by the 1965-70 Basic Tables. At the midpoint in time of the current study, the corresponding mortality ratio was 88 percent. Table 1 also gives results based on the new K Tables (currently proposed for valuation purposes), so that they will be available for comparison with the results of future studies.

TABLE 1
 1967-77 GROUP CONVERSION STUDY
 SELECT MORTALITY RATIOS
 BY POLICY YEAR FOR ALL ISSUE AGES COMBINED
 RATIOS OF ACTUAL DEATHS TO EXPECTED DEATHS
 BASED ON AMOUNTS OF INSURANCE

POLICY YEAR	EXPOSED TO RISK (000) 1967-77	ACTUAL DEATHS (000) 1967-77	RATIOS OF ACTUAL DEATHS TO EXPECTED DEATHS		
			Based on 1958 CSO Table		Based on K Tables 1967-77
			1967-77	1959-67	
1.....	\$ 2,754,525	\$ 86,319	275%	350%	345%
2.....	2,368,335	64,842	228	233	287
3.....	2,167,848	51,051	187	214	235
4.....	2,011,696	44,527	165	193	208
5.....	1,759,649	38,167	152	185	191
6.....	1,521,020	39,854	172	170	217
7.....	1,309,645	34,043	162	161	203
8.....	1,114,686	24,938	131	162	164
9.....	928,056	23,170	136	157	170
10.....	755,648	22,055	148	145	184
11.....	613,010	17,148	132	148	163
12.....	476,311	15,596	143	145	176
13.....	368,388	10,807	119	133	146
14.....	268,419	8,466	120	131	147
15.....	237,924	7,650	119	124	146
16.....	215,149	6,994	119	122	145
17.....	192,847	6,187	116	111	141
18.....	172,212	5,612	116	108	141
19.....	154,652	4,631	105	106	129
20.....	141,567	4,146	103	104	126
Total.....	\$19,531,587	\$516,203	169%	176%	211%

The following tabulation indicates the variation in the contributing companies' mortality ratios for the first twenty policy years compared with the all-company average of 169 percent based on the 1958 CSO Table.

	Number of Companies	Proportion of Actual Deaths
Percentage points below average:		
More than 30	3	18%
15-30	1	24
0-15	3	32
Percentage points above average:		
0-15	3	10
15-30	3	15
More than 30	2	1

The following tabulation provides a further breakdown of the variation by company in the first five policy years.

	POLICY YEAR 1 AVERAGE MORTALITY RATIO 275%		POLICY YEARS 2-3 AVERAGE MORTALITY RATIO 208%		POLICY YEARS 4-5 AVERAGE MORTALITY RATIO 159%	
	Number of Companies	Proportion of Actual Deaths	Number of Companies	Proportion of Actual Deaths	Number of Companies	Proportion of Actual Deaths
Percentage points below average:						
More than 60	2	16%	0	0%	0	0%
30-60	0	0	3	19	3	14
0-30	3	14	7	56	7	63
Percentage points above average:						
0-30	2	9	4	21	3	15
30-60	3	45	1	4	2	8
More than 60	5	16	0	0	0	0

By Issue Age and Policy Year

Table 2 consists of three parts. The first part displays mortality ratios by issue age and duration for males and females combined based on the 1965-70 Basic Tables. The second part gives the same information based on the 1958 CSO Table, and the third part gives a measure of the credibility of the ratios by showing the number of actual deaths in the experience. The ratios based on the 1965-70 Basic Tables show substantial anti-

TABLE 2
 1967-77 GROUP CONVERSION STUDY
 SELECT MORTALITY RATIOS IN TEN-YEAR ISSUE-AGE GROUPS
 BASED ON AMOUNTS OF INSURANCE

POLICY YEAR	ISSUE AGES						
	Under 25	25-34	35-44	45-54	55-64	65 and Over	All Ages
Ratios of Actual Deaths to Expected Deaths by 1965-70 Basic Tables							
1.....	1,603%	1,112%	1,187%	1,081%	1,221%	926%	1,091%
2.....	791	1,249	698	763	649	617	687
3.....	725	675	583	468	486	373	463
4.....	439	933	534	392	364	271	370
5.....	193	599	362	351	355	252	326
6.....	371	716	478	390	341	263	352
7.....	358	580	310	405	298	221	314
8.....	490	418	270	234	269	217	249
9.....	295	303	257	269	279	198	251
10.....	249	411	257	334	237	199	260
11.....	143	345	329	242	205	163	220
12.....	677	455	305	298	194	144	228
13.....	501	340	233	176	202	140	185
14.....	391	242	219	192	181	155	184
15.....	264	275	187	197	182	141	180
16.....	170	208	191	171	135	107	149
17.....	254	182	171	157	137	113	145
18.....	169	215	194	153	125	102	146
19.....	299	161	159	144	103	111	132
20.....	164	148	144	129	122	105	129
All years	544%	513%	360%	357%	355%	288%	342%
Ratios of Actual Deaths to Expected Deaths by 1958 CSO Table							
1.....	572%	348%	369%	297%	280%	223%	275%
2.....	300	432	273	283	201	193	228
3.....	293	259	263	209	192	138	187
4.....	181	374	264	191	163	111	165
5.....	78	245	183	177	159	113	152
6.....	147	306	260	213	155	123	172
7.....	141	257	175	236	141	108	162
8.....	196	197	157	138	129	110	131
9.....	120	152	154	159	137	108	136
10.....	104	215	157	200	122	118	148
11.....	61	191	207	148	112	105	132
12.....	297	261	195	187	113	97	143
13.....	226	201	152	115	122	95	119
14.....	185	148	148	131	112	103	120
15.....	131	176	131	136	112	93	119
16.....	93	140	145	134	108	92	119
17.....	144	125	131	122	111	97	116
18.....	99	149	149	119	102	88	116
19.....	179	113	123	112	85	96	105
20.....	100	104	112	101	102	92	103
All years	222%	249%	205%	193%	163%	134%	169%

COMMITTEE ON MORTALITY—ORDINARY

TABLE 2—Continued

POLICY YEAR	ISSUE AGES						All Ages
	Under 25	25-34	35-44	45-54	55-64	65 and Over	
Number of Actual Deaths							
1.....	72	129	354	1,047	2,677	2,805	7,084
2.....	24	100	229	815	1,809	2,111	5,088
3.....	25	66	239	664	1,530	1,902	4,426
4.....	19	56	193	665	1,382	1,763	4,078
5.....	9	54	197	598	1,322	1,691	3,871
6.....	13	56	223	620	1,243	1,586	3,741
7.....	15	60	193	638	1,179	1,551	3,636
8.....	15	51	201	591	1,080	1,438	3,376
9.....	14	56	203	614	1,083	1,359	3,329
10.....	9	52	205	643	999	1,281	3,189
11.....	15	62	246	575	952	1,249	3,099
12.....	10	61	249	612	900	1,104	2,936
13.....	11	66	231	547	871	1,069	2,795
14.....	10	52	227	587	783	974	2,633
15.....	7	79	242	574	786	847	2,535
16.....	10	63	258	570	710	672	2,283
17.....	11	74	262	551	655	562	2,115
18.....	8	99	268	556	576	444	1,951
19.....	16	87	271	513	501	304	1,692
20.....	16	86	284	496	517	242	1,641
All years	329	1,409	4,775	12,476	21,555	24,954	65,498

selection in the first few policy years and persistently worse than standard mortality for all ages and durations.

By Calendar Year of Issue and Policy Year

Table 3 shows mortality ratios for each of the first five policy years by calendar year of issue. No significant trend by year of issue is discernible.

Select Experience by Sex

More than 99 percent of the select data submitted was identified by sex. Table 4 shows the select experience by issue age and policy-year group for males and females separately. Table 4, like Table 2, is divided into three parts: mortality ratios based on the 1965-70 Basic Tables, mortality rates based on the 1958 CSO Table, and number of actual deaths. Antiselection as measured by the Basic Tables is substantially

TABLE 3
 1967-77 GROUP CONVERSION STUDY
 SELECT MORTALITY RATIOS BY CALENDAR YEAR OF ISSUE FOR POLICY YEARS 1-5
 BASED ON AMOUNTS OF INSURANCE

YEAR OF ISSUE	POLICY YEAR				
	1	2	3	4	5
Ratios of Actual Deaths to Expected Deaths by 1965-70 Basic Tables					
1963.....					325%
1964.....				165%	327
1965.....			276%	347	300
1966.....		470%	533	420	373
1967.....	828%	623	478	435	338
1968.....	1,037	683	485	329	320
1969.....	1,246	668	533	426	315
1970.....	1,146	731	482	503	316
1971.....	1,219	654	477	238	322
1972.....	1,220	822	523	336	328
1973.....	1,198	718	410	453	
1974.....	1,047	536	408		
1975.....	1,157	859			
1976.....	818				
All years.....	1,091%	687%	463%	370%	326%
Ratios of Actual Deaths to Expected Deaths by 1958 CSO Table					
1963.....					151%
1964.....				74%	153
1965.....			113%	156	141
1966.....		159%	218	189	175
1967.....	212%	208	194	195	157
1968.....	265	229	197	148	149
1969.....	318	223	217	191	147
1970.....	295	247	198	228	149
1971.....	306	215	191	106	149
1972.....	302	269	207	147	150
1973.....	300	237	163	200	
1974.....	260	175	162		
1975.....	290	283			
1976.....	204				
All years.....	275%	228%	187%	165%	152%

TABLE 4
1967-77 GROUP CONVERSION STUDY
SELECT MORTALITY RATIOS BY SEX*
BASED ON AMOUNTS OF INSURANCE

POLICY YEARS	SEX	ISSUE AGES						
		Under 25	25-34	35-44	45-54	55-64	65 and Over	All Ages
Ratios of Actual Deaths to Expected Deaths by 1965-70 Basic Tables								
1.....	Male	1,430%	924%	1,075%	1,034%	1,169%	897%	1,037%
	Female	2,585	2,682	2,930	1,668	1,790	1,315	1,753
	Total	1,601	1,110	1,187	1,080	1,220	925	1,090
2-5...	Male	478	849	520	474	455	372	449
	Female	1,015	987	763	509	424	324	452
	Total	539	861	533	476	452	368	449
6-10..	Male	295	477	313	330	293	226	291
	Female	870	650	382	325	252	189	267
	Total	364	490	317	329	289	222	289
11-15..	Male	406	345	265	230	195	149	206
	Female	250	249	211	186	190	158	182
	Total	371	336	262	227	195	150	204
16-20..	Male	244	186	171	152	127	110	143
	Female	161	152	180	148	118	98	130
	Total	212	181	172	152	126	108	141
Ratios of Actual Deaths to Expected Deaths by 1958 CSO Table								
1.....	Male	533%	289%	337%	288%	280%	227%	270%
	Female	741	830	810	395	283	192	312
	Total	571	347	369	297	280	223	274
2-5...	Male	201	328	241	217	189	147	190
	Female	294	353	325	189	112	87	133
	Total	216	330	246	215	180	140	184
6-10..	Male	123	224	182	196	147	118	157
	Female	272	300	195	136	83	82	105
	Total	146	230	183	191	139	114	151
11-15..	Male	192	205	177	153	123	102	135
	Female	90	141	108	82	71	80	80
	Total	164	199	172	147	114	99	128
16-20..	Male	150	132	136	124	107	96	117
	Female	88	90	99	78	81	79	83
	Total	124	126	132	118	103	93	113

* Totals in Table 4 are based on data distinguishable by sex whereas figures in Table 2 are based on all data.

TABLE 4—Continued

POLICY YEARS	SEX	ISSUE AGES						
		Under 25	25-34	35-44	45-54	55-64	65 and Over	All Ages
Number of Actual Deaths								
1.....	Male	52	99	265	782	2,145	2,405	5,748
	Female	19	29	88	262	522	395	1,315
	Total	71	128	353	1,044	2,667	2,800	7,063
2-5...	Male	48	215	699	2,199	4,970	6,450	14,581
	Female	29	59	159	537	1,055	999	2,838
	Total	77	274	858	2,736	6,025	7,449	17,419
6-10..	Male	42	212	874	2,588	4,468	6,132	14,316
	Female	24	63	147	510	1,105	1,070	2,919
	Total	66	275	1,021	3,098	5,573	7,202	17,235
11-15..	Male	33	260	1,015	2,426	3,349	4,392	11,475
	Female	20	60	180	469	943	849	2,521
	Total	53	320	1,195	2,895	4,292	5,241	13,996
16-20..	Male	33	319	1,097	2,179	2,293	1,826	7,747
	Female	28	90	246	507	666	398	1,935
	Total	61	409	1,343	2,686	2,959	2,224	9,682

greater in the first policy year for females than for males; at policy durations over 10, however, the mortality ratios for males tend to be higher than for females.

Ultimate Experience

Tables 5 and 6 show the ultimate mortality ratios (policy years 21 and over) by attained-age group. Table 5 shows that each of the attained-age groups—except the lowest, where exposure is very sparse—has mortality

TABLE 5
1967-77 GROUP CONVERSION STUDY
ULTIMATE MORTALITY RATIOS BY ATTAINED-AGE GROUP
EXPERIENCE EXCLUDES FIRST TWENTY POLICY YEARS
BASED ON AMOUNTS OF INSURANCE

ATTAINED AGE	EXPOSED TO RISK (000) 1967-77	ACTUAL DEATHS 1967-77		RATIOS OF ACTUAL DEATHS TO EXPECTED DEATHS			
				Based on 1965-70 Basic Tables 1967-77		Based on 1958 CSO Table	
		Number	:0001	1967-77	1967-77	1959-67	
Under 45.....	\$ 26,506	53	\$ 105	164%	102%	89%	118%
45-54.....	261,504	801	1,862	123	86	104	108
55-64.....	512,685	3,535	9,030	118	90	111	118
65-74.....	418,262	6,561	16,398	113	88	103	113
75-84.....	146,657	6,030	12,188	106	89	100	102
85 and over....	15,396	1,042	1,755	70	61	86	63
All ages.....	\$1,381,010	18,022	\$41,338	109%	87%	104%	107%

ratios, based on the 1958 CSO Table, that are lower than those in the 1959-67 study. Table 5 also shows mortality ratios based on the new K Tables, so that they will be available for comparison with future studies.

Table 6 shows ultimate mortality results by sex. The ratios on the Basic Tables are lower for females than for males; also, the male ratios decrease with increasing attained age, whereas the female ratios are higher at ages 55-74 than at other ages.

LAPSE RATES

Table 7 shows lapse rates by sex, issue age, and policy year. Early persistency is better at the higher issue ages than at the lower issue ages. Lapse rates for males are generally higher than those for females.

The lapse rates are lower in earlier policy years than in the 1959-67 study and slightly higher in the later policy years. When compared with

TABLE 6
 1967-77 GROUP CONVERSION STUDY
 ULTIMATE MORTALITY RATIOS BY ATTAINED-AGE
 GROUP AND SEX*
 EXPERIENCE EXCLUDES FIRST TWENTY POLICY YEARS
 BASED ON AMOUNTS OF INSURANCE

Attained Age	Male	Female	Male and Female Combined
Ratios of Actual Deaths to Expected Deaths by the 1965-70 Basic Tables			
Under 45.....	228%	82%	164%
45-54.....	137	77	123
55-64.....	120	109	118
65-74.....	113	110	113
75-84.....	107	96	106
85 and over.....	70	70	70
All Ages.....	111%	99%	109%
Ratios of Actual Deaths to Expected Deaths by the 1958 CSO Table			
Under 45.....	149%	48%	102%
45-54.....	102	45	86
55-64.....	97	59	90
65-74.....	92	60	88
75-84.....	92	71	89
85 and over.....	61	60	61
All Ages.....	92%	61%	87%
Number of Actual Deaths			
Under 45.....	35	18	53
45-54.....	595	206	801
55-64.....	2,795	740	3,535
65-74.....	5,307	1,254	6,561
75-84.....	4,861	1,169	6,030
85 and over.....	808	234	1,042
All Ages.....	14,401	3,621	18,022

* All ultimate data were identified by sex, so totals in this table are the same as in Table 5.

TABLE 7
 1967-77 GROUP CONVERSION STUDY
 SELECT LAPSE RATES
 BASED ON AMOUNTS OF INSURANCE

POLICY YEAR	SEX	ISSUE AGES				
		Under 45	45-54	55-64	Over 64	All Ages
1.....	Male	16.0%	14.8%	9.9%	5.3%	13.5%
	Female	19.6	14.8	9.4	4.5	14.2
	Total	16.4	14.8	9.8	5.2	13.6
2.....	Male	5.3	4.2	3.0	2.1	4.2
	Female	6.2	4.4	2.7	1.8	4.3
	Total	5.4	4.2	3.0	2.0	4.3
3.....	Male	3.4	3.5	2.7	1.8	3.2
	Female	3.3	2.6	1.8	2.4	2.6
	Total	3.4	3.4	2.5	1.8	3.1
4.....	Male	2.5	2.6	2.4	1.5	2.4
	Female	2.6	2.1	2.0	1.2	2.2
	Total	2.5	2.6	2.4	1.5	2.4
5.....	Male	2.7	3.0	2.4	2.1	2.7
	Female	3.5	3.0	1.9	1.3	2.7
	Total	2.8	3.0	2.3	2.0	2.7
6.....	Male	2.5	2.6	2.0	1.5	2.4
	Female	2.1	2.0	1.3	1.3	1.8
	Total	2.5	2.5	1.9	1.5	2.3
7.....	Male	2.3	2.2	1.9	1.2	2.1
	Female	2.7	1.5	1.4	1.3	1.9
	Total	2.4	2.1	1.8	1.2	2.1
8.....	Male	2.1	2.2	1.9	3.3	2.2
	Female	2.2	2.0	1.5	1.6	1.9
	Total	2.1	2.2	1.9	3.1	2.2
9.....	Male	1.6	2.5	2.8	1.6	2.0
	Female	1.6	2.5	1.2	1.2	1.7
	Total	1.6	2.5	2.6	1.5	2.0
10.....	Male	1.8	2.4	3.3	2.1	2.2
	Female	2.1	1.9	1.9	2.0	2.0
	Total	1.8	2.3	3.0	2.1	2.2
11-15.....	Male	2.1	2.5	2.1	2.6	2.3
	Female	1.9	2.1	2.0	2.3	2.0
	Total	2.1	2.5	2.1	2.6	2.2
16-19.....	Male	2.1	3.3	3.2	6.0	2.6
	Female	2.1	2.7	2.3	5.5	2.4
	Total	2.1	3.2	3.0	5.9	2.6

data developed by the Life Insurance Marketing and Research Association for nonconversion policies, conversion policies appear to have better persistency than nonconversion policies, except for the first policy year. This is perhaps to be expected given the antiselection revealed by conversion mortality ratios.

Contributing Companies

The following companies contributed their experience for this study:

- Confederation Life Insurance Company
- Continental Assurance Company
- John Hancock Mutual Life Insurance Company
- Lincoln National Life Insurance Company
- Massachusetts Mutual Life Insurance Company
- Metropolitan Life Insurance Company
- Mutual Benefit Life Insurance Company
- Mutual Life Insurance Company of New York
- New England Mutual Life Insurance Company
- New York Life Insurance Company
- Occidental Life Insurance Company of California
- Provident Life and Accident Insurance Company
- Prudential Insurance Company of America
- Sun Life Assurance Company of Canada
- Travelers Insurance Company

