TRANSACTIONS OF SOCIETY OF ACTUARIES
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DIGEST OF INFORMAL DISCUSSION

MORTALITY

1. (*a*) What has been the recent mortality experience under term insurance plans both before and after conversion?
   (*b*) Has any difference been observed in the experience on level term insurance plans as compared with decreasing term insurance policies or riders?
2. Is there any evidence of a reversion to the experience of the 1920's and early 1930's in the mortality on large risks?

MR. J. S. ELSTON presented the mortality experience of the Travelers Insurance Company on term issues of 1931 and later observed to the an-

TABLE 1

Plan	Actual Deaths	Ratio of Actual to Tabular	
		No.	Amt.
5 Year Automatic Term	480	78%	82%
Term Expectancy	662	78	85
Supplemental Agreements	......	......	59
Other Terms	182	73	76
Total	1,324	77%	79%
All forms other than Term, excluding attained age conversions	10,083	76%	79%

TABLE 2

MORTALITY BY SIZE OF POLICY UNDER ALL TERM FORMS*

Size of Policy	Actual Deaths	Ratio of Actual to Tabular	
		No.	Amt.
Under $5,000	420	69%	66%
$ 5,000–$10,000	754	81	77
$10,100–$49,000	120	77	70
$50,000 and Over	30	131	143
Total	1,324	77%	79%

* Excluding Supplemental Agreements as to number.

niversaries in 1948. These issues were standard medically examined policies. The tabular deaths were computed by the Joint 1937–1940 Mortality Table, the ultimate part of which is based on Table 9 of Mr. John S.

TABLE 3

MORTALITY UNDER POLICIES CONVERTED FROM TERM INSURANCE

Years after Conv.	Conversions Made at End of Conversion Period			Conversions Made Prior to End of Conversion Period			All Conversions		
	Actual Deaths	Ratio of Actual to Tabular		Actual Deaths	Ratio of Actual to Tabular		Actual Deaths	Ratio of Actual to Tabular	
		No.	Amt.		No.	Amt.		No.	Amt.
	Conversions from 5 Year Automatic Term Policies								
1	195	128%	140%	28	74%	62%	223	117%	122%
2	171	114	126	36	94	107	207	110	121
3	181	120	129	48	119	124	229	120	128
4	165	111	134	42	103	115	207	110	129
5	175	121	136	32	79	82	207	112	124
6 and Sub.	1,318	108	112	336	88	82	1,654	103	104
Total	2,205	112%	120%	522	90%	87%	2,727	107%	112%
	Conversions from Other Forms of Term Insurance								
1	23	139%	178%	38	85%	87%	61	100%	105%
2	10	74	56	28	67	86	38	69	80
3	14	113	176	40	99	90	54	102	105
4	12	103	98	35	97	89	47	98	91
5	14	139	123	24	72	80	38	87	87
6 and Sub.	104	128	155	242	94	87	346	102	99
Total	177	121%	143%	407	90%	87%	584	97%	97%

Thompson's paper, appearing on page 325 of *TASA* XLII, and the select part on suitable modifications for a three year select period. The experience was as given in Table 1, war deaths being included in all of the figures presented.

The variations of the experience by size groups within the different term forms did not appear to be especially significant. For all term forms combined the experience by size of policies was as shown in Table 2.

Their experience on attained age conversions for the same period was also presented and appears in Table 3. The tabular deaths were calculated according to the original date of selection, on the basis of the Joint 1937–1940 table. Mr. Elston pointed out that the experience included conversions after 1931 of term policies issued prior to that date, and that the mortality basis is therefore a very strict standard for the policies analyzed. He stated that allowance should be made for this in studying the figures.

MR. G. L. HOLMES had the feeling that his experience in the profession had been backwards. He had started with great faith in facts in the way of statistics, but, having lost faith in some of them, he had come to rely on impressions. He thought it might pay to look at this problem from the point of view of the impressions of an underwriter. What are the reasons that bring increased mortality in term insurance? In approaching this question he thought that a term policy should be regarded as term insurance through to its final death or lapse after conversion, the conversion privilege being merely a form of renewal of the term policy.

He suggested that some of the extra mortality shown by most of the statistics comes from original selection, but thought the amount from that source was fairly small and that it could be controlled by the medical committee to a very large extent. It was his impression that the largest amount of extra mortality arose from the process of "reselling," whereby the best lives are sold out of the term group. Agents resell term policyholders on permanent plans and also on term policies that have lower premium rates or a longer renewal and conversion period. Those engaged in selection work see the select lives being taken out of the term insurance group. He felt that if this is true, the extra mortality under term insurance should tend to build up as more and more of the lives are sold out of the term group. The mortality will therefore depend, up to a certain point, on the length of time during which a term policy can be renewed or converted.

Another impression Mr. Holmes had was that where the conversion or renewal options are available at high ages a company will have a considerably greater extra mortality, because it seemed to him that a far greater proportion of lives who come in at, say, age 55 are substandard at age 60, than those who come in at age 40 are substandard at age 45.

He did not think that the resale idea operates to the same extent where family income coverage is attached to a permanent policy.

MR. W. J. NOVEMBER presented the preconversion term insurance mortality experience of the Equitable Life Assurance Society for the periods from 1940 to 1945 and 1945 to 1948 policy anniversaries. (The mortality ratios appear in the accompanying table.) For the 1945–1948 observation period the ratios were in relation to the crude rates of mortality by amount which prevailed under their general standard medically examined business of the same years of issue and observation. For the 1940–1945 period the ratios were in relation to a graduated select table based on his company's experience under standard medically examined business between 1940 and 1945 anniversaries.

The mortality figures indicate a moderate excess of mortality on term plans, an excess that has materialized in spite of the stricter standards imposed by his company for the issuance of term insurance.

Plan	Deaths (Number of Policies)		Mortality Ratios by Amounts	
	1940 to 1945	1945 to 1948	1940 to 1945	1945 to 1948
5 Year Term	181	53	113%	106%
10 Year Term	193	109	101	112
15 and 20 Year Term	104	49	100	86

He stated that the mortality ratios by number of policies were consistently a few points lower than by amount of insurance, indicating anti-selection on the part of applicants. There was no discernible pattern of variation by age at issue. There was a tendency in the 1945–1948 experience for the mortality ratios to increase with policy duration. This characteristic was not present in the earlier study and might not be statistically significant. Mr. November thought there was the possibility that it was indicative of greater anti-selection under term policies when renewal premiums fall due and have to be paid.

His company issues another form of term insurance, a two year initial term policy with automatic continuance on a permanent plan. The number of deaths experienced was so small that mortality ratios for that policy were not presented, but it was stated that the general level of mortality was higher than for any of the other term plans.

The Equitable's 1945–1948 experience was confined to preconversion mortality, but the 1940–1945 study did cover postconversion mortality as well. Mr. November did not present details as to that experience because they will appear elsewhere in this volume of the *Transactions* (see page

204). He did say, however, that it has been their conclusion from this and earlier studies that policies which are converted in the early years of the term period produced somewhat better mortality after the first couple of years following conversion than policies which are converted at or toward the end of the conversion period.

At the time his company studied their term mortality between 1940–1945 policy anniversaries, they also made an analysis of the mortality under their Family Income policy, which is a combination of Ordinary Life with decreasing term insurance to produce $10 a month of income per $1,000 of face amount. The experience under such a policy may not be indicative of decreasing term insurance *per se* because of the way in which the insurance is tied in with the Ordinary Life plan, but he thought the resulting mortality might nevertheless be of interest under the general topic being discussed. By amounts of insurance (and they used a level annual amount for the exposures and claims), the mortality ratio in relation to their 1940–1945 select table was 104%. However, if it had not been for one large claim this ratio would have been 92%. By numbers of policies the mortality ratio was 97%. Their feeling after making several successive studies of Family Income mortality is that the general level is not much different from that under their general business.

While not particularly covered by the wording of the question, the Equitable's experience under the supplementary protector benefit issued in connection with their juvenile policies was regarded as of possible interest since it does represent a form of decreasing term insurance. They studied the issues of 1938, 1939 and 1940 through 1948 policy anniversaries. The benefit is waiver of premiums under the juvenile policy until insurance age 21 in event of the death of the parent before that time. The expected deaths were computed from the crude rates of mortality derived from standard medically examined issues of comparable years observed over the same period. The actual deaths by policies were slightly under 100% of the expected deaths. There was no discernible trend by duration. There was a tendency for the ratios to increase with age, but this tendency might be discounted because of the small volume. There were only 79 policies terminated by death in the experience.

In regard to the second question of the topic under discussion, Mr. November referred to the report on the mortality under large amount policies which appears elsewhere in this volume of the *Transactions* and described various features of the report.

MR. PEARCE SHEPHERD stated that the Prudential had studied their term experience from time to time and while they had a series of memoranda on the subject, he wanted to refer to one which does not really qualify as recent because it relates to their experience under 10 and 15 year term policies issued in 1920 to 1924 and observed to 1934.

The issues amounted to 44 million dollars during those years. About 4 million of it was still in force on a term basis at the end of the period. Over 25 million had been terminated by lapse or expiration and about 10 million had been converted before the end of the conversion period. About $2\frac{1}{2}$ million had been converted at the end of the conversion period, which was seven years on the 10 year term policy and twelve years on the 15 year term policy.

The term experience during the term period was found to be good, perhaps 3% to 5% higher mortality than on their Ordinary Life policies, but nothing of any significant amount. That has been characteristic of their term insurance throughout. Policies converted before the expiration of the conversion period also showed a good mortality. Mr. Shepherd thought they were the policies that Mr. Holmes had referred to as having been "resold" out of a company's term insurance category. The policies converted at the end of the conversion period did show anti-selection. He did not present any actual ratios but stated that they were about in line with figures already cited.

Mr. Shepherd commented also on the higher mortality under term policies, as shown in the study of large amount policies and referred to by Mr. Elston. That characteristic showed up in their term experience in the contribution to the large amount study and it bothered him a bit. He was not sure that it was anything that could be governed by a company's initial selection. He did not think that underwriters were smart enough to pick the term applicants in that category who were responsible for the higher mortality. He suggested that a lot of it was perhaps due to anti-selection that is exercised on renewal dates. It also might be a characteristic of the purpose for which the insurance was sold, rather than of the plan of insurance sold. He did not feel a company is going to correct the situation by refusing to issue term insurance in those cases.

MR. E. W. MARSHALL stated that experience has shown that the mortality on policies of large amount is particularly responsive to three influences: (a) anti-selection by the policyholder, (b) underwriting precautions at time of issue, and (c) the economic cycle.

He pointed out that the underwriting precautions and economic conditions prevailing since about 1936 have been conducive to favorable mortality on policies of large amount. It was not surprising to him then that, as shown in the report of the Committee on Mortality presented by Mr. Murphy earlier in the meeting, the current mortality on policies of large amount is quite low. He emphasized, however, that there are still reminders that such policies are subject to special risks. As Mr. Murphy mentioned, the mortality under term policies of large amount was nearly half again as great as that under life and endowment insurance. Despite care in initial underwriting and the relatively favorable economic conditions of recent years, a differential in mortality resulted from anti-selection at and after issue. This illustrated the ever present risk inherent in policies of large amount.

For many years the Provident Mutual has been comparing its mortality under policies of $25,000 or over with that under smaller policies. These results have been reported at actuarial meetings from time to time. The experience brought down to the 1948 anniversary was presented by Mr. Marshall and appears in the accompanying table.

RELATION OF MORTALITY RATIO ON BLOCKS OF $25,000 OR MORE INSURANCE TO THAT ON SMALLER BLOCKS

Issues of 1923–1947 Combined

Experience during Policy Years Ending in	Ratio Large to Small Policy Experience
1924–1928	68%
1929–1932	177
1933–1935	129
1936–1948	91

The prohibitively high relative mortality which obtained on policies for large amount during the depression period and continued through 1936 was to be noted. This high mortality occurred even on the 1924–1927 issues of the Provident Mutual, on which a very favorable mortality had been experienced before the depression.

With past experience in mind, Mr. Marshall warned that we cannot forget that a sudden and large increase can occur in the mortality under policies of large amount during an economic depression, although policies of smaller amount are but slightly affected. He pointed out that those who studied individual death losses on the policies of large amount during the depression period realized that the extra deaths were largely a function of the large amounts of insurance involved. When policyholders experienced a drastic reduction in income, it seemed that their large holdings of life insurance invited suicides and "accidents." At the same time the physical and mental strain appeared to result in a larger death rate from other causes. It was his conclusion that careful underwriting precautions continue to be needed in order to prevent heavy extra losses on large policies over the years.