TRANSACTIONS OF SOCIETY OF ACTUARIES 1952 REPORTS

TRANSACTIONS

1952 REPORTS OF MORTALITY AND MORBIDITY EXPERIENCE

REPORT OF THE COMMITTEE ON MORTALITY UNDER ORDINARY INSURANCES AND ANNUITIES

MORTALITY UNDER STANDARD ORDINARY INSURANCE ISSUES
BETWEEN 1950 AND 1951 ANNIVERSARIES

Ordinary insurance issues between 1950 and 1951 anniversaries. It takes up in turn the mortality experienced under

- 1. Standard Ordinary insurance issued subject to a medical examination, during each of the first fifteen policy years,
- 2. Standard Ordinary insurance issued without a medical examination, during each of the first fifteen policy years, and
- Standard Ordinary insurance—medical and nonmedical issues combined during the sixteenth and subsequent policy years.

The report also includes data on the trend of mortality during the past twelve or more years (a) on standard Ordinary medically examined insurance in the first fifteen policy years, and (b) on standard Ordinary insurance—medical and nonmedical issues combined—in the sixteenth and subsequent policy years.

The names of the contributing companies and their proportionate contributions to the total exposures are given in Table A of the Appendix.

EXPERIENCE UNDER STANDARD MEDICALLY EXAMINED ISSUES DURING THE FIRST FIFTEEN YEARS OF INSURANCE

The current experience during the first fifteen years of insurance is based on an exposure of \$44,419,266,000 and actual claims of \$148,164,000, excluding war deaths. There were 597 policies representing \$2,080,000 in claims reported as deaths due to operations of war during this period, which it should be noted covered the early intensive stages of the Korean War.

Expected deaths were calculated on the 1946-49 Select Basic Table (TSA II, 506). The mortality ratios on this table—both excluding and including war deaths—are presented in Table 1 by age groups at issue for all years of issue combined. The experience by year of issue (or by policy year) for all ages at issue combined is presented in Table 2. The detailed

experience by age groups at issue for each year of issue (or each policy year) is set forth in Table B of the Appendix. Table C of the Appendix shows the war deaths in the experience for the period from 1949 to 1950 anniversaries. No such breakdown of war deaths was published in last year's report.

Table 1 brings out that, with war deaths excluded, the largest improvements in mortality on medical issues as compared with the 1946-49 Select

TABLE 1

STANDARD MEDICALLY EXAMINED ISSUES OF 1936 TO 1950
EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES
BY AGE AT ISSUE
POLICY YEARS 1 TO 15 COMBINED
(Amounts Shown in \$1,000 Units)

		ACTUAL I)EATHS	EXPECTED DEATHS ON	MORTALITY RATIO		
Ages at Issue	EXPOSED TO RISK	Excluding War Deaths	War Deaths	1946-1949 SELECT BASIC TABLE	Excluding War Deaths	Including War Deaths	
10-14 15-19 20-24 25-29 30-34 35-39	\$ 1,120,164 2,138,566 4,767,521 7,200,389 8,449,540 7,931,584	\$ 875 2,036 4,509 8,802 15,378 24,310	\$ 188 374 555 566 264 104	\$ 1,021 2,276 5,125 9,774 16,262 24,524	85.7% 89.5 88.0 90.1 94.6 99.1	104.1% 105.9 98.8 95.8 96.2 99.6	
40-44 45-49 50-54 55-59 60-64	6,129,457 3,730,194 1,947,246 760,793 206,093	27,976 27,065 20,406 10,877 4,531	22 6 1 0	29,780 29,129 22,026 12,760 5,287	93.9 92.9 92.6 85.2 85.7	94.0 92.9 92.6 85.2 85.7	
65 and over	37,719 \$44,419,266	\$148,164	\$2,080	\$159,345	93.0%	94.3%	

Basic Table have occurred at ages 10-29 and 55-64 at issue. The experience for the period from 1949 to 1950 anniversaries also showed the largest improvements in mortality at these ages.

The aggregate mortality ratio—excluding war deaths—for the period from 1950 to 1951 anniversaries (93.0%) was some 3 percentage points lower than that (96.1%) for the period from 1949 to 1950 anniversaries.

When war deaths are included, the aggregate mortality ratio for the period from 1950 to 1951 anniversaries is increased by 1.3 percentage points (from 93.0% to 94.3%). More than 50% of the total amount of war claims was paid on policies issued at ages 10-24. The inclusion of war deaths increased the mortality ratios for age groups 10-14, 15-19, 20-24,

and 25-29 at issue by 18.4, 16.4, 10.8, and 5.7 percentage points respectively. In the age group 30-34 at issue, war deaths accounted for less than 2% of the claims; at older ages war deaths were negligible. This indicates the extent to which war deaths have been concentrated at ages under 30 at issue. It should be noted that in the experience for the period from 1949 to 1950 anniversaries, war deaths did not increase any of the mortality ratios by as much as 2 percentage points.

TABLE 2

STANDARD MEDICALLY EXAMINED ISSUES OF 1936 TO 1950

EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES

BY YEAR OF ISSUE

ALL AGES COMBINED

(Amounts Shown in \$1,000 Units)

			ACTUAL	DEATHS	EXPECTED DEATHS ON	MORTALITY RATIO		
Year of Issue	Policy Year	Exposed to Risk	Excluding War Deaths	War Deaths	1946-1949 SELECT BASIC TABLE	Exclud- ing War Deaths	Includ- ing War Deaths	
1936	15	\$ 2,008,267	\$ 15,523	\$ 31	\$ 16,391	94.7%	94.9%	
1937	14	2,170,558	13,607	42	15,135	89.9	90.2	
1938	13	2,101,713	12,427	59	13,101	94.9	95.3	
1939	12	1,808,783	8,831	43	10,094	87.5	87.9	
1940	11	2,071,684	9,460	61	10,317	91.7	92.3	
1941	10	2,575,400	10,161	109	11,269	90.2	91.1	
1942	9	1,861,362	7,811	51	8,158	95.7	96.4	
1943	8 7	2,163,815	9,280	49	9,605	96.6	97.1	
1944		2,501,345	9,989	53	10,084	99.1	99.6	
1945	6 5	2,800,945	9,505	60	10,299	92.3	92.9	
1946	5	4,268,011	10,145	233	12,144	83.5	85.5	
1947	4 3	4,232,002	10,118	191	10,864	93.1	94.9	
1948		3,985,587	8,394	204	8,656	97.0	99.3	
1949	2	4,378,619	6,662	339	7,150	93.2	97.9	
1950	1	5,491,175	6,251	555	6,078	102.8	112.0	
All Years of Issue.		\$44 ,419,266	\$148,164	\$2,080	\$159,345	93.0%	94.3%	

Table 2 reveals no clear-cut differences in mortality by year of issue (or by policy year). More than 50% of the total amount of war claims on the fifteen years of issue covered by this study was paid on the issues of 1950, 1949, and 1948. The inclusion of war deaths increased the mortality ratio for the issues of 1950 (first policy year) by 9.2 percentage points, that for the issues of 1949 (second policy year) by 4.7 percentage points, and that for the issues of 1948 (third policy year) by 2.3 percentage points. For no other year of issue was the mortality ratio in-

creased by more than 2 percentage points on account of the inclusion of war deaths. This gives some indication of the extent to which war deaths have been concentrated on recently issued policies.

Table 3 presents an analysis of the current experience on medical issues according to the major subdivisions by cause of death based on the Committee's 1950 Code for Cause of Death (TSA I, 617). It might be noted

TABLE 3

STANDARD MEDICALLY EXAMINED ISSUES OF 1936 TO 1950

EXPERIENCE (INCLUDING WAR DEATHS) BETWEEN 1950 AND 1951 ANNIVERSARIES

PERCENTAGE DISTRIBUTION BY CAUSE OF DEATH OF AMOUNTS PAID IN CLAIMS

Cause of Death	Tuber- cu- losis (All Forms)	Malig- nant Neo- plasms	Dia- betes Melli- tus	Vascular Lesions Affecting Central Nervous System	Dis- eases of the Heart and Circu- latory Sys- tem	Pneu- monia and In- fluen- za	Accidents and i	Sui- cide	War Deaths	All Other Causes and Un- known
Committee's 1950 Code:	01,02	18-33	37	42	49–55	56-59	88-96, 98	97	99	Resid- ual
Ages 10-29 at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.8% 2.0 1.6	12.5% 15.5 14.4	.1% .4 .3	1.5% 3.0 2.5	5 4°% 21.2 15.3	367 1.2 9	46.6% 26.1 33.5	3.9°% 7.0 5.8	17.5% 4.6 9.4	11 4°6 19.0 16 3
Ages 30-39 at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.9 1.1 1.0	17.2 16.7 16.9	.6 .2 .3	2.4 5.3 4.5	28.2 42.2 38.5	1.6 .9 1.1	23.5 11.1 14.4	7.2 6.4 6.6	3.1	15.3 16.0 15.8
Ages 40-49 at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.6 .8 .7	17.8 22.2 21.0	.0 1.3 .9	2.2 6.4 5.2	47.4 47.6 47.6	.8 .6 .7	12.7 5.0 7.2	5.6 2.7 3.5	.0	12.7 13.4 13.1
Ages 50 and over at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.3	21.5 20.1 20.5	,2 1.4 1.1	6.1 10.2 9.1	49.9 49.1 49.3	.3 1.3 1.0	9.6 3.8 5.4	2.0 2.0 2.0	.0	10.1 11.7 11.3
All Ages at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.6	17.7 19.5 19.0	.2	3.1 6.7 5.6	36.7 43.7 41.7	.8	19.9 8.6 11.8	4 9 4.0 4.2	3.5 .5 1.4	12.6 14.3 13.9

that at ages under 30 at issue in the first five policy years the 17.5% of the total deaths that were war claims were equivalent to an annual cost of \$.16 per \$1,000 of insurance.

EXPERIENCE UNDER STANDARD NONMEDICAL ISSUES DURING THE FIRST FIFTEEN YEARS OF INSURANCE

This study presents for the first time an intercompany experience on nonmedical issues. In past years the Committee had not felt it advisable to undertake a study of nonmedical insurance on an intercompany basis because of the wide variations in the rules being followed by the companies in the writing of that business. With the very rapid growth of nonmedical insurance, the Committee has reconsidered its position and has come to the conclusion that a study of nonmedical insurance is advisable in order that a more complete mortality picture might be developed. The growing importance of nonmedical business is indicated by the fact that, for the sixteen companies contributing to this study, nonmedical insurance accounted for approximately 10% of the standard issues of 1936 (by amounts), which proportion rose to approximately 20% for the standard issues of 1950 (based on exposures during the period from 1950 to 1951 anniversaries).

The nonmedical experience, like that on medical issues, is limited to the first fifteen years of insurance. It is based on an exposure of \$8,613,565,000 and actual claims of \$12,285,000, excluding war deaths. There were 476 policies representing \$1,033,000 in claims reported as deaths due to operations of war during the period covered by this study. The much higher proportion of war deaths in the nonmedical experience as compared with the medical experience was to have been expected.

Expected deaths were calculated on the 1946-49 Select Basic Table (TSA II, 506) which was based on the experience under medical issues. The mortality ratios for nonmedical business on this table—both excluding and including war deaths—are presented in Table 4 by age groups at issue for all years of issue combined. The corresponding experience by year of issue (or by policy year) for all ages at issue combined is presented in Table 5. The detailed experience by age groups at issue for each year of issue (or each policy year) is set forth in Table D of the Appendix.

Table 4 brings out that, with war deaths excluded, nonmedical mortality was above the 1946–49 Select Basic Table except at ages under 25 at issue. For all durations combined, nonmedical mortality was higher than on medical business except at issue ages 10–19. The mortality ratios on nonmedical business for all durations combined exceeded those on medical business by 10 to 15 percentage points in the age ranges 25–34 and 45–49 at issue and by about 25 percentage points for ages 40–44 and 50 and over at issue. (The nonmedical insurance issued at ages 45 and over represents business issued under special circumstances, as for instance under salary allotment plans.)

When war deaths are included, the aggregate mortality ratio on non-medical issues is increased by 8.5 percentage points (from 100.4% to 108.9%). Nearly 80% of the total amount of war claims was paid on policies issued at ages 10-24. The inclusion of war deaths increased the

mortality ratios for age groups 10-14, 15-19, 20-24, and 25-29 at issue by 18.3, 22.9, 15.7, and 8.5 percentage points respectively. In the age group 30-34 at issue, war deaths accounted for less than 2% of the claims; at older ages war deaths were negligible. This emphasizes again the extent to which war deaths have been concentrated at ages under 30 at issue.

In so far as the experience in the early durations is concerned, Table 5 suggests that the first policy year death rate on nonmedical business (112.9% for all ages combined) is relatively higher than on medical business (102.8% for all ages combined).

TABLE 4

STANDARD NONMEDICAL ISSUES OF 1936 TO 1950
EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES
BY AGE AT ISSUE
POLICY YEARS 1 TO 15 COMBINED
(Amounts Shown in \$1,000 Units)

AGES AT	Exposed	ACTUAL 1	DEATHS	EXPECTED DEATHS ON 1946-1949	Mortality Ratio			
Issue			Excluding War War Deaths Deaths		Excluding War Deaths	Including War Death		
10–14	\$ 522,820	\$ 333	\$ 75	\$ 410	81.2%	99.5%		
15–19	1,582,139	1,369	359	1,567	87.4	110.3		
20-24	2,405,178	2,126	363	2,309	92.1	107.8		
25-29	1,889,543	2,272	190	2,244	101.2	109.7		
30–34	1,190,021	2,270	37	2,078	109.2	111.0		
35–39	692,105	1,919	8	1,891	101.5	101.9		
40-44	272,960	1,461	1	1,227	119.1	119.2		
45-49	47,200	403	0	389	103.6	103.6		
50 and over.	11,599	132	0	115	114.8	114.8		
All Ages.	\$8,613,565	\$12,285	\$1,033	\$12,230	100.4%	108.9%		

After the first policy year, when war deaths are excluded, there seem to be no clear-cut differences in nonmedical mortality by duration. Over 60% of the total amount of war claims on the fifteen years of issue covered by this study was paid on the issues of 1950, 1949, and 1948. The inclusion of war deaths increased the mortality ratio for the issues of 1950 (first policy year) by 29.1 percentage points, that for the issues of 1949 (second policy year) by 24.6 percentage points, and that for the issues of 1948 (third policy year) by 15.1 percentage points. On the issues of 1943 and earlier years the inclusion of war deaths did not increase any of the mor-

tality ratios by as much as 4 percentage points. This gives some indication of the extent to which war deaths have been concentrated on recently issued nonmedical policies.

Table 6 presents an analysis of the current experience on nonmedical issues according to the major subdivisions by cause of death based on the Committee's 1950 Code for Cause of Death (TSA I, 617). It might be noted that at ages under 30 at issue in the first five policy years the

TABLE 5

STANDARD NONMEDICAL ISSUES OF 1936 TO 1950
EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES
BY YEAR OF ISSUE
ALL AGES COMBINED

(Amounts Shown in \$1,000 Units)

			Actual	DEATHS	EXPECTED DEATHS ON	Mortali	TY RATIO
YEAR OF ISSUE	POLICY YEAR	Exposed to Risk	Excluding War Deaths	War Deaths	1946-1949 Select Basic Table	Exclud- ing War Deaths	Includ- ing War Deaths
1936	15	\$ 227,412	\$ 821	\$ 4	\$ 811	101.2%	101.7%
1937	14	234,157	700	\$ 4 7	727	96.3	97.2
1938	13	219,608	661	12	591	111.8	113.9
1939	12	231,966	584	13	565	103.4	105.7
1940	11	263,620	574	12	565	101.6	103.7
1941	10	320,597	616	20	597	103.2	106.5
1942	9	266,580	525	9	482	108.9	110.8
1943	8 7	475,145	842	29	810	104.0	107.5
1944	7	531,383	844	51	841	100.4	106.4
1945	6	586,074	809	46	876	92.4	97.6
1946	5	1,126,919	1,312	84	1,449	90.5	96.3
1947	4 3	955,680	1,186	111	1,150	103.1	112.8
1948	3	844,229	890	140	930	95.7	110.8
1949	2	968,448	841	216	879	95.7	120.3
1950	1	1,361,747	1,080	279	957	112.9	142.0
All Years of Issue.		\$8,613,565	\$12,285	\$1,033	\$12,230	100.4%	108.9%

19.6% of the total deaths that were war claims were equivalent to an annual cost of \$.20 per \$1,000 of insurance.

Ideally it would have been desirable to compare the nonmedical experience with an experience on exactly comparable policies issued with a medical examination. Data for such a comparison, however, are not available. Table 7 presents side by side the experience on medical and nonmedical issues as reported to the Committee. In so far as these figures

TABLE 6

STANDARD NONMEDICAL ISSUES OF 1936 TO 1950 EXPERIENCE (INCLUDING WAR DEATHS) BE-TWEEN 1950 AND 1951 ANNIVERSARIES

PERCENTAGE DISTRIBUTION BY CAUSE OF DEATH OF AMOUNTS PAID IN CLAIMS

Cause of Death:	Tuber- culosis (All Forms)	Malig- nant Neo- plasms	Dia- betes Melli- tus	Vascular Lesions Affecting Central Nervous System	Dis- eases of the Heart and Circula- tory Sys- tem	Pneu- monia and In- fluen- za	Acci- dents and Homi- cide	Sui- cid e	War Deaths	All Other Causes and Un- known
Committee's 1950 Code:	01, 02	18-33	37	42	49-55	56-59	88-96, 98	97	99	Resid- ual
Ages 10-29 at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	1.0% 3.3 2.0	9.0% 14.3 11.3	. 3% . 8 . 5	1.9% 2.1 2.0	5.0% 17.7 10.5	1.3% 1.4 1.3	41.3% 25.3 34.5	3 7% 5.2 4.3	19.6% 6.5 13.9	16.9% 23.4 19.7
Ages 30-39 at issue Policy Years 1-5 Policy Years 6-15. Policy Years 1-15	1 3 1.8 1.7	18.4 15.9 16.8	. 8	2.9 4.7 4.1	26 9 42.1 36.7	1.0 2.3 1.8	23.1 9.9 14.5	3 4 3.3 3.3	2.9 .0 1.1	19 4 19 2 19 2
Ages 40-49 at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	1.9	19.5 21.8 21.1	. 5	5 6 6 0 5 9	40.4 48.2 45.9	3.0 .8 1.4	9.3 4.7 6.0	4 2 2 2 2 8	2 0 1	15 4 15 0 15 2
Ages 50 and over at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	.0 .0 .0	24.2 17.7 21.5	.0	12.1 3.9 8.8	53.5 52.9 53.3	.0 2.0 .8	2 2 9.8 5.3	.0 3.9 1.6	.0	8.0 9.8 8.7
All Ages at issue Policy Years 1-5 Policy Years 6-15 Policy Years 1-15	1.2 2.3 1.7	12.4 16.3 14.5	.4 .7 .6	2.6 3.8 3.3	14.1 32.8 24.2	1.4 1.6 1.5	33.5 15.6 23.8	3.6 3.9 3.8	13.5 2.8 7.7	17.3 20.2 18.9

TABLE 7

COMPARISON OF MEDICAL AND NONMEDICAL EXPERIENCE† BY AGE GROUP AT ISSUE AND DURATION ISSUES OF 1936 TO 1950 BETWEEN 1950 AND 1951 ANNIVERSARIES MORTALITY RATIOS ON 1946-49 SELECT BASIC TABLE

	POLICY YEARS									
AGE GROUP	1-2		3-5		6-10		11-15		1-15	
AT ISSUE	Medi- cal %	Non- medi- cal %	Medi- cal %	Non- medi- cal %	Medi- cal %	Non- medi- cal %	Medi- cal %	Non- medi- cal %	Medi- cal %	Non- medi- cal %
10-19. 20-29. 30-39. 40-49. 50 and over	99.0 91.3 93.2 101.0 102.3	87.5 106.4 106.8 123.9 157.9*	81.9 88.4 84.7 96.6 89.1	88.1 91.2 101.3 115.5 104.5	93.1 91.6 101.1 96.2 88.1	85.6 92.0 109.7 113.3 163.2*	84.8 87.9 101.6 88.4 89.3	82 2 100 7 103 9 115 2 75 8*	88.3 89.3 97.3 93.4 89.8	86.1 96.6 105.5 115.3 114.8
All Ages	97.6	104.6	90.5	96.0	94.6	100.8	92.0	102.5	93.0	100.4

[†] Excludes war deaths.

^{*} Mortality ratio based on fewer than 25 policies terminated by death.

go, they indicate (a) that nonmedical mortality is higher than on medical business for ages 20 and over at issue at all durations and (b) that the excess of nonmedical mortality over medical mortality increases with advancing issue age.

Additional data furnished the Committee show that females constitute a distinctly higher proportion of nonmedical business than of medical business. This is brought out in the table below.

PROPORTION	OF FEMALE LIVES*
ON MEDICAL AND	NONMEDICAL BUSINESS

	Issues	ог 1940	Issues	or 1945	Issues of 1950		
AGES AT ISSUE	Medical Business	Nonmedical Business	Medical Business	Nonmedical Business	Medical Business	Nonmedical Business	
10-19. 20-29. 30-39. 40-49. 50 and over.	24.5% 14.9 8.7 10.1 11.5	32.9% 23.3 14.8 15.7	28.4% 24.4 9.1 9.3 10.1	38.2% 56.7 24.8 12.0 7.6	17.1% 6.9 4.9 8.1 10.5	23.8% 15.0 13.7 12.0 10.4	
All Ages.	12.8%	23.7%	13.5%	40.4%	7.0%	16.5%	

^{*} Proportion of female lives based on data reported to the Committee as percentage of issues or as percentage of exposures between 1950 and 1951 anniversaries.

To the extent that females constitute a higher proportion of the non-medical experience than of the medical experience, Table 7 understates the excess of nonmedical mortality over medical mortality.

There was considerable variation in the experience of individual companies on nonmedical business. There did not appear to be any clear-cut correlation between the level of mortality on nonmedical business and the maximum amounts of insurance accepted without medical examination nor with other rules for the acceptance of nonmedical business. The level of mortality on nonmedical business did, however, appear to follow the level of mortality on medical business and also showed an inverse correlation with the proportion of female lives in the nonmedical issues. These relationships are brought out in the table below.

RELATIONSHIP BETWEEN THE MORTALITY LEVELS ON MEDICAL AND NONMEDICAL BUSINESS ACCORDING TO PROPORTION OF FEMALE LIVES IN NONMEDICAL ISSUES

MORTALITY RATIOS ON MEDICAL BUSINESS	MORTALITY RATIOS ON NONMEDICAL ISSUES IN COMPANIES* WITH						
	Relatively High Proportion of Female Lives on Nonmedical Issues	Relatively Low Proportion of Female Lives on Nonmedical Issues					
Under 90% 90–100% Over 100%	94.8% (3 companies) 100.6% (4 companies)	98.8% (3 companies) 109.7% (2 companies) 115.6% (1 company)					

^{*}One company did not have any material to contribute on nonmedical issues while two others could not be included in the above table because they did not report the proportion of female lives in nonmedical issues

EXPERIENCE UNDER STANDARD ISSUES DURING THE 16TH AND SUBSEQUENT POLICY YEARS

The current experience during the 16th and subsequent policy years is based on an exposure of \$19,754,516,000 and actual claims of \$374,032,000, excluding war deaths. There were 55 policies representing \$85,000 in claims reported as deaths due to operations of war during this period.

Expected deaths were calculated on the 1946–49 Ultimate Basic Table (TSA II, 507) and also on the Commissioners 1941 Standard Ordinary Mortality Table. The mortality ratios on these tables—both excluding and including war deaths—are presented in Table 8 by attained age groups.

The aggregate mortality ratio on the 1946-49 Ultimate Basic Table—excluding war deaths—for the period from 1950 to 1951 anniversaries (94.9%) was 1.8 percentage points lower than that (96.7%) for the period from 1949 to 1950 anniversaries. The inclusion of war deaths increased the mortality ratios appreciably only at attained ages 25-34—by 9.9 percentage points at attained ages 25-29 and by 4.5 percentage points at attained ages 30-34.

Table 9 presents an analysis of the current experience on business in the 16th and subsequent policy years according to the major subdivisions by cause of death based on the Committee's 1950 Code for Cause of Death (TSA I, 617).

MORTALITY TRENDS

The data presented in past reports of the Mortality Committee of the Actuarial Society and in the reports of this Committee shed light on the

TABLE 8

STANDARD ISSUES DURING 16TH AND SUBSEQUENT POLICY YEARS EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES

BY ATTAINED AGE ALL POLICY YEARS COMBINED

(Amounts Shown in \$1,000 Units)

						М	ORTALITY	RATIO (ис
ATTAINED EXPOSED AGES TO RISK		ACTUAL DEATHS		Ехрестер	DEATHS ON	Ulti	-1949 mate Table	CSO Table	
AGES	TO KISK	Excluding War Deaths Death		1946–1949 Ultimate Basic Table	CSO Table	Ex- clud- ing clud- ing war Deaths Deaths		Ex- clud- ing War Deaths	In- clud- ing War Deaths
25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85-89 90-95	\$ 192,120 452,351 1,007,732 1,897,149 2,763,516 3,284,664 3,433,649 2,869,218 1,912,998 1,137,158 543,978 203,108 48,812 8,063	\$ 226 635 1,734 6,896 15,336 29,799 49,566 67,019 66,391 61,807 40,319 23,822 8,491 1,971	\$23 30 5 15 12 0 0 0 0 0	\$ 232 670 2,048 6,294 15,675 31,043 34,151 71,836 70,766 62,143 43,957 24,657 8,744 1,946	\$ 612 1,806 5,300 13,601 27,715 47,465 72,478 89,285 88,107 78,205 55,332 30,344 10,568 2,498	94.8 84.7 109.6 98.0 96.0 91.5 93.3 93.8 99.5 91.7 96.6 97.1 101.3	107.3% 99.3 84.9 109.8 98.0 96.0 91.5 93.3 93.8 99.5 91.7 96.6 97.1 101.3	36.9% 35.2 32.7 50.7 55.4 62.8 68.4 75.1 75.4 79.0 72.9 78.5 80.3 78.9	40.7% 36.8 32.8 50.8 55.5 62.8 68.4 75.1 75.9 77.9 78.5 80.3 78.9
All Ages	\$19,754,516	\$374,032	\$85	\$394,162	\$523,316	94.9%	94.9%	71.5%	71.5%

TABLE 9

Standard Issues during 16th and Subsequent Policy Years Experience (Including War Deaths) between 1950 and 1951 Anniversaries

PERCENTAGE DISTRIBUTION BY CAUSE OF DEATH OF AMOUNTS PAID IN CLAIMS

Cause of Death:	Tuber- culosis (All Forms)	Malig- nant Neo- plasms	Dia- betes Melli- tus	Vascular Lesions Affecting Central Nerv- ous System	of the	Pneu- monia and Influ- enza	Acci- dents and Homi- cide	Sui- cide	War Deaths	All Other Causes and Un- known
Committee's 1950 Code:	01,02	18-33	37	42	49–55	56-59	88–96, 98	97	99	Resid- ual
Attained Ages Under 40 40-49 50-59 60-69 70-79 80 and over	3.7% 1.6 5.2 .6 .3	16.0% 14.9 17.1 16.5 14.3 12.6	1.3% .7 1.1 1.4 1.3	3.7% 4.9 8.8 10.7 14.5 14.6	22.3% 42.0 46.3 53.6 55.6 54.4	.9% .9 .8 1.0 1.4 3.8	21.3% 12.4 4.4 2.4 1.3 1.7	6.7% 5.3 2.8 1.4 .6	2.2% .1 .0 .0 .0	21.9% 17.2 13.5 12.4 10.7 11.2
Total	1.5%	15.7%	1.2%	11.3%	51.8%	1.3%	3.2%	1.6%	.0%	12.4%

* Medical Issues

mortality trends during the past twelve or more years. The following three series of mortality rates illustrate these trends:

- 1. Mortality rates on standard Ordinary medical issues for policy years 1-5, inclusive, by quinquennial age groups at issue, for each year of experience from policy anniversaries in 1929 to policy anniversaries in 1951. These detailed mortality rates by age groups at issue are given in Table E of the Appendix. The trend year by year of these death rates by approximate attained age groups in the range from 20 to 64 is presented in Charts I to IX. (The translation of age groups at issue into approximate attained age groups was made from the central age for each age group at issue.)
- 2. Mortality rates on standard Ordinary medical issues for policy years 6-15, inclusive, by approximate quinquennial attained age groups, for each year of experience from policy anniversaries in 1939 to policy anniversaries in 1951. These detailed mortality rates by approximate attained age groups are given in Table F of the Appendix. The trend year by year of these death rates in the age range from 20 to 64 is presented in Charts I to IX.
- 3. Mortality rates on standard Ordinary business (medical and nonmedical combined) in the sixteenth and subsequent policy years by quinquennial attained age groups, for each year of experience from policy anniversaries in 1939 to policy anniversaries in 1951. These detailed mortality rates by attained age groups are given in Table G of the Appendix. The trend year by year of these death rates in the age range from 25 to 64 is presented in Charts II to IX.

CHART I

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE

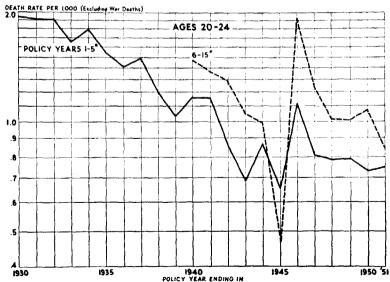


CHART II

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE

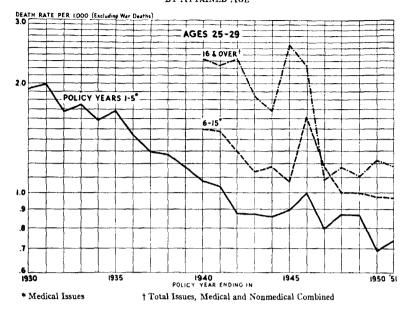


CHART III

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE

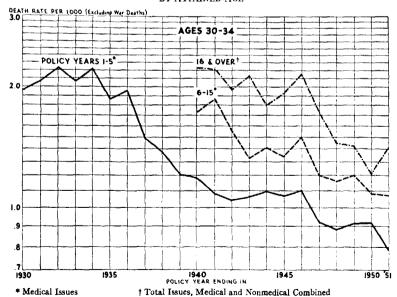
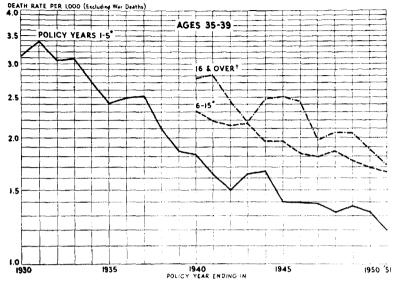


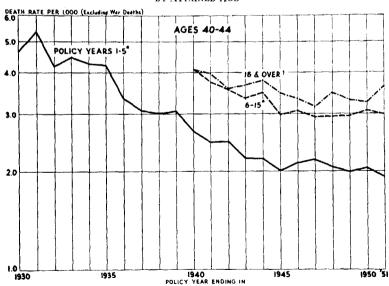
CHART IV

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE



- * Medical Issues
- † Total Issues, Medical and Nonmedical Combined

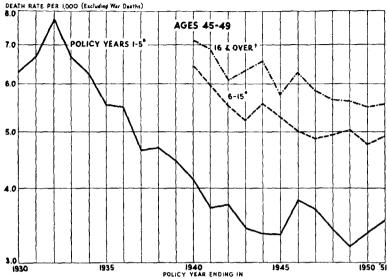
 $\begin{array}{c} \textbf{CHART} \ \ \textbf{V} \\ \textbf{Mortality Trends on Standard Ordinary Issues} \\ \textbf{by Attained Age} \end{array}$



- * Medical Issues
- † Total Issues, Medical and Nonmedical Combined

CHART VI

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE

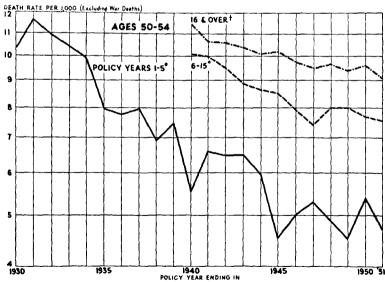


* Medical Issues

† Total Issues, Medical and Nonmedical Combined

CHART VII

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE

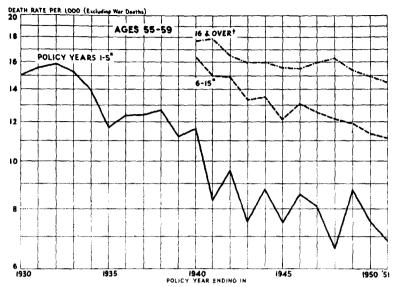


* Medical Issues

† Total Issues, Medical and Nonmedical Combined

CHART VIII

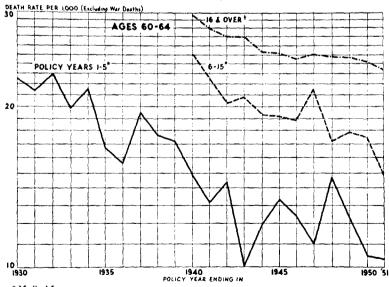
MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE



- * Medical Issues
- † Total Issues, Medical and Nonmedical Combined

CHART IX

MORTALITY TRENDS ON STANDARD ORDINARY ISSUES BY ATTAINED AGE



- * Medical Issues
- † Total Issues, Medical and Nonmedical Combined

The relatively high mortality rates at ages under 35 which are manifest in the charts for some of the war years (notably the period from 1945 to 1946 anniversaries) are believed to reflect the excess deaths among insured lives in military service, largely due to service accidents, which were left in the study after elimination of deaths coded as due to operations of war.

The mortality trends during the period from 1929 to 1951 anniversaries on standard Ordinary medical issues in the first five policy years are summarized in Table 10. This table indicates that, from the period 1929-34

TABLE 10
TREND OF EXPERIENCE ON MEDICAL ISSUES*
FIRST FIVE POLICY YEARS

Ages at	Experienc	E FOR PERIOD BE	ETWEEN ANNIVERS	SARIES IN INDICA	TED YEARS
Issuz	1929-1934	1934-1939	1939-1943	1943-1947	1947-1951
	Morta	ality Rate per 1,	000 (Based on A	mounts of Insur	ance)
10-14 15-19 20-24 25-29 30-34 35-39 10-44 15-49	1.021 1.838 1.868 1.912 2.491 3.588 5.509 8.057	0.945 1.409 1.404 1.383 1.767 2.743 3.934 5.896	0.646 1.039 0.980 0.998 1.290 1.910 2.987 4.621	0.643 0.942 0.853 0.961 1.162 1.672 2.615 4.044	0.517 0.870 0.797 0.810 0.975 1.566 2.437 4.096
50-54 55-59 50-64 55 and over	12.523 17.458 25.053 35.970	9.708 13.582 19.321 28.806	7,787 10,819 14,651 20,834	6.053 9.211 12.121 18.679	5.607 8.776 12.804 24.290
}_	M	lortality Index w	vith 1939–1943 F	xperience = 1009	%
10-14	158.0% 176.9 190.6 191.6 193.1 187.9 184.4 174.4 160.8 161.4 171.0 172.7	146.3% 135.6 143.3 138.6 137.0 143.6 131.7 127.6 124.7 125.5 131.9 138.3	100.0% 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	99.5% 90.7 87.0 96.3 90.1 87.5 87.5 87.5 87.5 87.5 87.7 89.7	80.0% 83.7 81.3 81.2 75.6 82.0 81.6 88.6 72.0 81.1 87.4

^{*} Excludes war deaths.

anniversaries to the period 1939-43 anniversaries, mortality in the first five policy years, excluding war deaths, improved more or less irregularly by from 40% to 50%. The table also shows that, from the period 1939-43 anniversaries to the period 1947-51 anniversaries, mortality in the first five policy years, excluding war deaths, improved by about 20% at issue ages under 60. In interpreting the significance of this latter improvement in mortality, it should be kept in mind that an increasingly higher proportion of business at ages under 45 has in recent years been issued on a nonmedical basis. As a result the character of medical issues at ages under 45 may well have changed somewhat.

The mortality trends during the period from 1939 to 1951 anniversaries on standard Ordinary medical issues in the sixth to fifteenth policy years are summarized in Table 11. This table shows that, from the period 1939–43 anniversaries to the period 1947–51 anniversaries, mortality at these durations, excluding war deaths, has improved by attained age more or less irregularly by from 15% to 30%.

The mortality trends during the period from 1939 to 1951 anniversaries on standard Ordinary business—medical and nonmedical issues combined—in the sixteenth and subsequent policy years are summarized in Table 12. This table shows that such ultimate mortality, excluding war deaths, has improved only from 10% to 15% at attained ages 40 and over; the improvement in ultimate mortality at attained ages 25–39 has been much greater.

The greater improvement in the mortality at attained ages 40 and over on medical issues during the first fifteen policy years as compared with medical and nonmedical issues combined in the sixteenth and subsequent policy years is believed to reflect, among other factors, improved underwriting methods developed in the last fifteen years.

TABLE 11
TREND OF EXPERIENCE ON MEDICAL ISSUES*
POLICY YEARS 6-15

Approximate Attained Ages		FOR PERIOD BETW S IN INDICATED Y	
ATTAINED MOES	1939-1943	1943-1947	1947-1951
		Rate per 1,000 ounts of Insuran	
17–19	1.006	0.777	0.881
	1.279	1.162	0.986
	1.339	1.257	0.987
30–34.	1.609	1.355	1.129
35–39.	2.193	1.884	1.735
40–44.	3.686	3.111	2.981
45–49.	5.792	5.194	4.883
50–54	9.636	8.107	7.788
	14.929	12.799	11.592
	22.218	19.638	16.796
65–69	37.049	28.470	25,651
	50.493	46.787	37,865
	72.883	83.668	58,066
		y Index with 19 xperience = 1009	
17-19. 20-24. 25-29. 30-34. 35-39. 40-44. 45-49. 50-54. 55-59. 60-64. 65-69. 70-74. 75 and over	100.0%	77.2%	87.6%
	100.0	90.9	77.1
	100.0	93.9	73.7
	100.0	84.2	70.2
	100.0	85.9	79.1
	100.0	84.4	80.9
	100.0	89.7	84.3
	100.0	84.1	80.8
	100.0	85.7	77.6
	100.0	88.4	75.6
	100.0	76.8	69.2
	100.0	92.7	75.0

^{*} Excludes war deaths.

TABLE 12

TREND OF EXPERIENCE ON BUSINESS*
IN 16TH AND SUBSEQUENT POLICY YEARS

ATTAINED AGES		OR PERIOD BETW IN INDICATED YI		
1102.0	1939-1943	1947-1951		
		Rate per 1,000 mounts of Insur		
25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85 and over	2.142 2.127 2.524 3.813 6.573 10.725 16.905 27.757 40.801 58.594 85.727 136.807 199.785	1. 785 1. 903 2. 336 3. 396 6. 108 9. 828 15. 725 24. 991 36. 797 56. 181 84. 016 124. 293 180. 111	1.171 1.364 1.922 3.381 5.569 9.427 15.197 24.203 36.381 53.862 79.971 113.844 177.068	
		y Index with 19 xperience = 100°		
25-29. 30-34. 35-39. 40-44. 45-49. 50-54. 55-59. 60-64. 65-69. 70-74. 75-79. 80-84. 85 and over.	100.0% 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	83.3% 89.5 92.6 89.1 92.9 91.6 93.0 90.0 90.2 95.9 98.0 90.9 90.2	54.7% 64.1 76.1 88.7 84.7 87.9 89.9 87.2 89.2 91.9 93.3 83.2 88.6	

^{*} Excludes war deaths.

APPENDIX

TABLE A

CONTRIBUTING COMPANIES PROPORTION OF TOTAL EXPOSURES CONTRIBUTED BY EACH

	FIRST 15 P	16TH AND	
Company	Medical Issues	Nonmedical Issues	SUBSEQUENT POLICY YEARS
Metropolitan	26.5%	15.5%	26.9%
Prudential	14.1	40.8	11.5
New York Life	10.5	11.3	
Northwestern Mutual	8.6	1	10.3
Equitable, New York	8.0	7.2	12.3
Mutual Life, N.Y	4.6	1.5	6.8
John Hancock	4.3	10.8	3.4
Mutual Benefit	3.8	. 5	4.2
Massachusetts Mutual	3.5	1.4	5.1
Travelers	3.3	.8	4.5
Penn Mutual	3.2	1.4	4.6
Aetna	2.5	1.0	3.2
Connecticut Mutual	2.5	2.8	2.1
Provident Mutual	1.7	. 1	2.4
Connecticut General	1.5	. 5	1.0
Sun Life, Canada	1.4	4.4	1.7
Total	100.0%	100.0%	100.0%

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TABLE B

STANDARD MEDICALLY EXAMINED ISSUES OF 1936 TO 1950 EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES BY YEAR OF ISSUE AND AGE AT ISSUE

EXPECTED DEATHS ON 1946-1949 SELECT BASIC TABLE

(Amounts Shown in \$1,000 Units)

			ACTUAL D	EATHS		Mortali	TY RATIO
ISSUE YEAR (POLICY YEAR)	Ages at Issue	Exposed to Risk	Excluding War Deaths	War Deaths	EXPECTED DEATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1936	10-14	\$ 78,676	\$ 61	\$12	\$ 91	67%	80%
(15)	15-19	127,732	155	12	179	87	93
	20-24	270,043	450	3	505	89	90
	25-29	354,279	1,186	4	1,045	113	114
	30–34	359,388	1,996	0	1,815	110	110
	35–39	321,608	2,721	0	2,640	103	103
	40-44	254,014	2,899	0	3,368	86	86
	45-49	141,828	2,085	0	3,002	69	69
	50-54	64,870	2,431	0	1,960	124	124
	55-59	26,927	1,152	0	1,174	98	98
	60-64	7,614	342	0	485	71	71
	65 and over	1,288	45	0	127	35	35
	All Ages	\$2,008 ,267	\$15,523	\$31	\$16,391	95%	95%
1937	10-14	\$ 85,549	\$ 86	\$25	\$ 98	88%	113%
(14)	15–19	139,477	164	14	179	92	99
	20-24	307,921	382	2	499	77	77
	25-29	386,139	891	1	989	90	90
	30-34	393,423	1,557	0	1,688	92	92
	35-39	333,434	2,339	0	2,321	101	101
i	40-44	260,212	2,685	0	2,927	92	92
	45-49	150,368	2,379	0	2,738	87	87
	50-54	73,679	1,804	0	1,943	93	93
	55-59	30,479	863	0	1,173	74	74
	60-64	8,478	324	0	463	70	70
	65 and over	1,399	133	0	117	114	114
	All Ages	\$2,170,558	\$13,607	\$42	\$15,135	90%	90%
1938	10-14	\$ 86,476	\$ 62	\$ 25	\$ 98	63%	89%
(13)	15-19	125,978	127	24	152	84	99
	20-24	280,095	306	1	395	77	78
	25-29	369,326	643	6	820	78	79
	30-34	396,467	1,746	3	1,491	117	117
	35-39	332,364	2,126	0	2,047	104	104
	40-44	247,554	2,724	0	2,438	112	112
	45-49 50-54	151,795	2,066	0	2,441	85 84	85 84
		71,855	1,402 776	0	1,670 980	79	79
	55-59 60-64	28,711 9,612	329	0	463	71	71
	65 and over	1,480	120	0	106	113	113
	All Ages	\$2,101,713	\$12,427	\$ 59	\$13,101	95%	95%

TABLE B-Continued

			ACTUAL I)eaths		Mortal	ту Катіо
ISSUE YEAR (POLICY YEAR)	Ages at Issue	Exposed to Risk	Excluding War Deaths	War Deaths	EXPECTED DEATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1939(12)	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	\$ 75,847 119,576 259,472 322,436 322,603 273,285 200,789 129,081 69,472 27,196 7,706 1,320	\$ 77 122 252 476 833 1,552 1,508 1,644 1,235 560 515 57	\$ 16 10 9 8 0 0 0 0 0 0	\$ 85 139 337 632 1,074 1,530 1,753 1,881 1,419 824 336 84	91% 88 75 75 78 101 86 87 87 68	109% 95 77 78 101 86 87 87 68 153 68
	All Ages	\$1,808,783	\$ 8,831	\$ 43	\$10,094	87%	88%
1940(11)	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	\$ 78,388 137,667 305,532 372,977 367,586 311,273 229,625 149,288 78,376 30,627 8,859 1,486	\$ 64 151 328 580 967 1,697 1,492 1,982 1,263 528 322 86	\$ 18 27 14 1 1 0 0 0 0 0	\$ 86 154 364 664 1,084 1,563 1,789 1,936 1,417 816 357 87	74% 98 90 87 89 109 83 102 89 65 90	95% 116 94 88 89 109 83 102 89 65 90
	All Ages	\$2,071,684	\$ 9,460	\$ 61	\$10,317	92%	92%
1941 (10)	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	\$ 87,266 186,301 378,972 449,426 462,184 396,744 277,745 187,309 96,392 38,119 12,693 2,249	\$ 64 225 352 682 1,176 1,571 1,617 1,970 1,207 910 315 72	\$ 27 31 27 1 10 13 0 0 0 0	\$ 94 203 421 710 1,169 1,734 1,880 2,088 1,510 879 462 119	68% 111 84 96 101 91 86 94 80 104 68 61	97% 126 90 96 101 91 86 94 80 104 68 61
	All Ages	\$2,575,400	\$10,161	\$109	\$11,269	90%	91%
1942(9)	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	\$ 63,900 131,789 216,338 304,443 328,296 296,982 221,461 158,373 89,691 37,200 10,588 2,301	\$ 83 160 194 489 723 1,202 1,596 1,226 930 774 297 137	\$ 13 26 5 3 4 0 0 0 0 0 0	\$ 65 142 229 441 742 1,161 1,335 1,552 1,268 767 347 109	128% 113 85 111 97 104 120 79 73 101 86 126	148% 131 87 112 98 104 120 79 73 101 86 126
	All Ages	\$1,861,362	\$ 7,811	\$ 51	\$ 8,158	96%	96%

TABLE B-Continued

			ACTUAL D	EATHS		Mortali	TY RATIO
ISSUE YEAR (POLICY YEAR)	Ages at Issue	Exposed to Risk	Excluding War Deaths	War Deaths	Expected Deaths	Exclud- ing War Deaths	Includ- ing War Deaths
1943	10-14	\$ 67,674		\$ 27	\$ 66	76%	117%
(8)	15-19	123,337	104	6	132	79	83
·	20-24 25-29	175,912 295,924	144 404	10	181 399	80 101	85 103
	30-34	373,108	933	ő	769	121	121
	35-39	390,477	1,433	0		104	104
	40-44	326,052	1,651	0	1.764	94	94
	45-49	224,961	1,948	0	1,962	99	99
	50-54 55-59	$122,556 \\ 48,490$	1,644 556	$\frac{1}{0}$	1,577 906	104 61	104 61
	60-64	12,943	319	0	375	85	85
	65 and over	2,381	94	ŏ :		94	94
	All Ages	\$2,163,815	\$ 9,280	\$ 49	\$ 9,605	97%	97%
1944	10-14	\$ 81,952	8 52		8 72	72%	94%
(7)	15-19	131,990	125	16	141	89	100
	2024 2529	164,395 281,032	123 278	7	161 346	76 80	81 83
	30-34	429,646	801	5	778	103	104
	35-39	486,013	1,522	Ò	1.458	104	104
	40-44	432,162	2,180	0	2.061	106	106
	45-49	273,224	2,094	0	2,030	103	103
	50-54	148,837	1,549	0	1,692	92	92
	55-59 60-64	55,770 13,815	855 311	$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$	916 339	93 92	93 92
	65 and over	2,509	99	0	90	110	110
	All Ages	\$2,501,345	\$ 9.989	\$ 53	\$10,084	99%	100%
1945	10-14	\$ 82,790	\$ 107	\$ 5		157%	165%
(6)	15-19	132,032	75	31	140	54	76
	20-24 25-29	$\frac{182,463}{316,018}$	136	4 20	179 370	76 94	78 99
	30-34	511,685	700	0	849	82	82
	35-39	576,027	1,685	ő	1,584	106	106
	40-44	471,269	2,027	0	2,107	96	96
	45-49	292,665	1,733	0	1,975	88	88
	50-54	158,839	1,444	0	1,688	86	86
	55-59 60-64	59,123 15,271	877 294	0	912 340	96 86	96 86
	65 and over	$\frac{13,271}{2,763}$	79	0		91	91
	All Ages	\$2,800,945	\$ 9,505	\$ 60	\$10,299	92%	93%
1946	10-14	\$ 85,641	\$ 53	\$ 4	\$ 64	83%	89%
(5)	15-19	154,382	104	59	164	63	99
	20-24 25-29	465,706 712,022	. 489 767	63 47	456 797	107 96	121 102
	30-34	838,199	922	34	1,249	74	77
	35-39	799,879	1,690	12	1,944	87	88
	40-44	602,037	1,842	14	2,384	77	78
	45-49	344,307	1,702	0	2,049	83	83
	50-54	179,368	1,566			93 77	93 77
	55-59 60-64	66,327 17,136	712	$\begin{bmatrix} & 0 \\ 0 \end{bmatrix}$	923 341	78	78
!	65 and over	3,007	33	0	83	40	40
	All Ages	\$4,268,011	\$10,145	\$233	\$12,144	84%	85%

,		i	Actual I) _{EATHS}	I	Mortali	ity Ratio
ISSUE YEAR (POLICY YEAR)	AGES AT ISSUE	EXPOSED TO RISK	Excluding War Deaths	War Deaths	EXPECTED DEATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1947 (4)	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	\$ 78,432 174,502 387,641 623,832 824,862 819,234 646,438 376,843 202,486 76,165 18,254 3,313	\$ 56 145 329 475 982 1,582 2,192 1,767 1,246 892 378 74	\$ 0 48 76 46 11 10 0 0 0 0 0	\$ 51 176 364 649 1,064 1,696 2,127 1,899 1,567 885 309 77	110% 82 90 73 92 93 103 93 80 101 122 96	110% 110 111 80 93 94 103 93 80 101 122 96
; \	All Ages	\$4,232,002	\$10,118	\$191	\$10,864	93%	95%
1948(3)	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	\$ 57,245 141,620 376,946 643,289 799,061 748,605 594,580 347,218 184,949 69,432 19,101 3,541	\$ 34 120 252 540 667 1,098 1,517 2,160 975 601 191 239	\$ 0 53 69 36 36 0 4 6 0 0	\$ 34 136 335 624 911 1,333 1,629 1,483 1,163 274 73	100% 88 75 87 73 82 93 146 84 91 70 327	100% 127 96 92 77 82 93 146 84 91 70 327
	All Ages	\$3,985,587	\$ 8,394	\$204	\$ 8,656	97%	99%
1949(2)	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	\$ 54,415 141,206 433,840 751,988 874,734 829,998 631,646 367,025 189,136 77,487 22,272 4,872	\$ 8 52 282 514 666 1,224 1,188 1,085 890 559 132 62	\$ 0 10 112 133 74 10 0 0 0 0 0	\$ 27 119 334 617 796 1,154 1,257 1,160 842 530 235 79	30% 44 84 83 84 106 95 94 106 105 56	30% 52 118 105 93 107 95 94 106 105 56 78
ſ	All Ages	\$4,378,619	\$ 6,662	\$ 339	\$ 7,150	93%	98%
1950(1)	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	\$ 55,913 170,977 562,245 1,017,258 1,168,298 1,015,661 733,873 435,909 216,740 88,740 21,751 3,810	\$ 18 207 490 529 709 868 858 1,224 820 262 197 69	\$ 0 7 153 246 86 59 4 0 0 0 0	\$ 22 120 365 671 783 985 961 933 620 414 161 43	82% 173 134 79 91 88 89 131 132 63 122 160	82% 178 176 115 102 94 90 131 132 63 122 160
	All Ages	\$5,491,175	\$ 6,251	\$555	\$ 6,078	103%	112%

TABLE C
STANDARD MEDICALLY EXAMINED ISSUES OF 1935 TO 1949
WAR DEATHS BETWEEN 1949 AND 1950 ANNIVERSARIES BY YEAR OF ISSUE
AND AGE AT ISSUE

(Amounts Shown in \$1,000 Units)

Issue	Policy	AGES AT ISSUE									
YEAR	YEAR	10-14	15-19	20-24	25-29	30-34	3539	40-44	45-49	50-54	All Age
1935	15	2			·						2
1936	14										θ
1937	13	2		3							5
1938	12	2	!		2						4
1939	11	1 1	2	1							4
1940	10	3	2	8	1	5			j	;	19
1941	9	4		2	5					!	11
1942	8	2	2					, ,			4
1943	7	2	1	!			5				8
1944	6	1	1								2
1945	5		13	5							18
1946	4		6	32	6	10		5	(2	61
1947	3		8	1	10	6					25
1948	2		6	23		12		,			41
1949	1		3		7			· · · · ·			10
All Years o	f Issue	19	44	75	31	33	5	5	0	2	214

TABLE D

STANDARD NONMEDICAL ISSUES OF 1936 TO 1950 EXPERIENCE BETWEEN 1950 AND 1951 ANNIVERSARIES BY YEAR OF ISSUE AND AGE AT ISSUE

EXPECTED DEATHS ON 1946-1949 SELECT BASIC TABLE

(Amounts Shown in \$1,000 Units)

				Ac	TUAL I	DEAT	нs		Mortali	ry Ratio
ISSUE YEAR (POLICY YEAR)	Ages at Issue		Exposed to Risk	ing	clud- War eaths		ar aths	ECTED ATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1936(15)	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	\$	15,691 34,980 61,769 52,332 36,208 15,848 8,261 2,113 209	\$	7 47 131 156 171 147 124 34 4 0	\$	1 1 2 0 0 0 0 0 0	\$ 18 49 116 154 183 130 110 45 6	39% 96 113 101 93 113 113 76 67	44% 98 115 101 93 113 113 76 67
	All Ages	\$	227,412	\$	821	\$	4	\$ 811	101%	102%
1937(14)	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	\$	14,499 37,228 66,410 52,413 36,571 15,872 8,107 2,524 359 128 46	\$	11 53 88 118 170 107 98 44 1	\$	4 1 2 0 0 0 0 0 0 0 0 0	\$ 17 48 108 134 157 110 91 46 9 5	65% 110 81 88 108 97 108 96 11 200 0	88% 113 83 88 108 97 108 96 11 200 0
i	All Ages	\$	234,157	\$	700	\$	7	\$ 727	96%	97%
1938 (13)	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	\$	16,369 34,824 59,749 48,392 34,927 15,303 7,697 2,148 183 14	\$	21 46 83 116 144 119 95 34 2 1	\$	5 6 0 1 0 0 0 0 0 0	\$ 18 42 84 107 131 94 76 35 4 0	117% 110 99 108 110 127 125 97 50	144% 124 99 109 110 127 125 97 50
	All Ages	\$	219,608	\$	661	\$	12	\$ 591	112%	114%

			Ac	TUAL I	DEAT	rns		Mortali	TY RATIO
ISSUE YEAR (POLICY YEAR)	AGES AT ISSUE	Exposed to Risk	ing	clud- War eaths		ar aths	PECTED CATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1939 (12)	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	\$ 16,606 38,397 62,466 51,137 36,134 16,685 8,041 2,286 211 3	\$	13 20 73 119 139 83 93 38 6	\$	6 4 3 0 0 0 0 0 0 0	\$ 19 45 81 100 120 93 70 33 4 0	68% 44 90 119 116 89 133 115 150	100% 53 94 119 116 89 133 115 150
	All Ages	\$ 231,966	\$	584		13	\$ 565	103%	106%
1940. (11)	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	\$ 17,322 44,901 74,057 58,621 40,350 17,855 8,169 2,167 161 12	\$	18 31 91 109 125 70 93 36 1 0	\$	4 5 0 3 0 0 0 0 0 0	\$ 19 50 88 104 119 90 64 28 3 0	95% 62 103 105 105 78 145 129 33	116% 72 103 108 105 78 145 129 33
i	All Ages	\$ 263,620	\$	574	\$	12	\$ 565	102%	104%
1941(10)	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	\$ 17,236 63,216 92,543 68,356 47,508 20,339 9,109 2,113 171 5	\$	17 49 79 98 166 96 85 26 0	\$	8 8 3 0 1 0 0 0 0	\$ 19 69 103 108 120 89 62 24 3 0	89% 71 77 91 138 108 137 108	132% 83 80 91 139 108 137 108 0
	All Ages	\$ 320,597	\$	616	\$	20	\$ 597	103%	107%
1942(9)	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	\$ 17,368 59,943 65,166 50,939 40,421 20,669 9,582 2,270 172 6 8 36	\$	20 49 77 81 110 81 81 24 2 0 0	\$	7 2 0 0 0 0 0 0 0 0 0	\$ 18 65 69 74 91 81 58 22 2 0 0	111% 75 112 109 121 100 140 109 100	150% 78 112 109 121 100 140 109 100
	All Ages	\$ 266,580	\$	525	\$	9	\$ 482	109%	111%

				A	CTUAL]	Dea	THS			MORTAL	ity Ratio
ISSUE YEAR (POLICY YEAR)	AGES AT ISSUE		Exposed to Risk	in	xclud- g War eaths		Var eaths		PECTED EATHS	Exclud- ing War Deaths	Includ- ing War Deaths
1943(8)	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	\$	40,901 112,204 98,950 83,507 71,375 47,991 17,458 2,467 255 25 2 10	\$	32 92 98 114 162 210 110 19 5 0 0	\$	16 12 1 0 0 0 0 0 0 0	\$	40 120 102 113 147 169 94 22 3 0	80% 77 96 101 110 124 117 86 167	120% 87 97 101 110 124 117 86 167
	All Ages	\$	475,145	\$	842	\$	29	\$	810	104%	108%
1944 (7)	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	\$	54,785 133,775 100,522 80,195 75,776 60,452 22,750 2,768 294 45 16 5	\$	59 122 86 97 139 190 102 32 12 5	\$	16 31 3 1 0 0 0 0 0 0	\$	48 143 99 99 137 181 109 21 3 1 0	123% 85 87 98 101 105 94 152 400 500	156% 107 90 99 101 105 94 152 400 500
	All Ages	\$	531,383	\$	844	\$	51	\$	841	100%	106%
19 4 5(6)	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	\$	58,401 134,942 112,794 101,966 83,959 66,175 24,597 2,800 352 80 8	\$	38 132 89 98 128 183 116 18 7	\$	4 31 10 1 0 0 0 0 0 0 0	\$	48 143 111 119 139 182 110 19 4 1	79% 92 80 82 92 101 105 95 175 0	88% 114 89 83 92 101 105 95 175 0
	All Ages	\$	586,074	\$	809	\$	46	\$	876	92%	98%
1946(5)	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	\$	48,715 138,332 369,906 308,598 147,856 82,388 26,595 3,613 670 200 37 9	\$	22 125 255 337 243 193 105 23 4 4 1	\$	3 46 19 12 0 3 1 0 0 0 0	\$	37 147 363 346 220 200 105 21 6 3	59% 85 70 97 110 97 100 110 67 133 100	68% 116 75 101 110 98 101 110 67 133 100
}	All Ages	\$ 1	,126,919	\$1	,312	\$	84	\$1	,449	91%	96%

			ACTUAL DEATHS		'	MORTALITY RATIO	
ISSUE YEAR (POLICY YEAR)	AGES AT ISSUE	Exposed to Risk	Excluding War Deaths	War Deaths	Expected Deaths	Exclud- ing War Deaths	Includ- ing War Deaths
1947(4)	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	\$ 50,900 179,499 281,398 208,730 121,478 77,845 29,569 4,560 1,246 345 67 43	\$ 20 170 243 218 181 168 125 31 12 12 0	\$ 1 63 37 10 0 0 0 0 0 0	\$ 33 181 265 217 157 161 97 23 10 4 1	61% 94 92 100 115 104 129 135 120 300 600 0	64% 129 106 105 115 104 129 135 120 300 600 0
	All Ages	\$ 955,680	\$1,186	\$111	\$1,150	103%	113%
1948 (3)	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	\$ 45,477 161,069 255,199 181,795 101,195 64,788 27,148 5,295 1,562 529 130 42	\$ 18 156 221 180 98 98 94 18 3 2 2 0	\$ 0 72 48 15 5 0 0 0 0 0	\$ 27 155 227 176 115 115 74 23 10 5 2	67% 101 97 102 85 85 127 78 30 40 100 0	67% 147 119 111 90 85 127 78 30 40 100 0
	All Ages	\$ 844,229	\$ 890	\$140	\$ 930	96%	111%
1949(2)	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	\$ 49,543 171,543 292,930 217,243 126,107 74,641 29,458 4,973 1,483 327 154 46	\$ 11 110 151 229 118 95 89 22 12 3 1	\$ 0 45 106 55 10 0 0 0 0 0	\$ 25 144 226 178 115 104 59 16 7 2 2	44% 76 67 129 103 91 151 138 171 150 50	44% 108 114 160 111 91 151 138 171 150 50
ļ	All Ages	\$ 968,448	\$ 841	\$216	\$ 879	96%	120%
1950(1)	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	\$ 59,007 237,286 411,319 325,319 190,156 95,254 36,419 5,103 1,397 341 103 43	\$ 26 167 361 202 176 79 51 4 6 1 3 4	\$ 0 32 129 92 21 5 0 0 0 0 0	\$ 24 166 267 215 127 92 48 11 4 2	108% 101 135 94 139 86 106 36 150 50 300	108% 120 184 137 155 91 106 36 150 50 300
	All Ages	\$1,361,747	\$1,080	\$279	\$ 957	113%	142%

TABLE E

EXPERIENCE* OF THE FIRST FIVE POLICY YEARS ON STANDARD MEDICALLY EXAMINED ISSUES BETWEEN 1929 AND 1951 ANNIVERSARIES MORTALITY RATE PER 1,000 BY AGE AT ISSUE BASED ON AMOUNT OF INSURANCE

	Experience in Policy Year Ending in:						
ACES AT ISSUE	1930	1931	1932	1933	1934	1935	1936
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	0.972 2.083 1.915 2.033 2.335 3.625 5.300 7.316 11.969 18.642 22.188 34.743	1.093 1.776 2.156 1.946 2.598 3.744 6.324 7.947 13.434 16.700 25.063 35.121	0.978 1.783 1.816 1.794 2.550 3.525 5.581 8.009 14.148 16.902 29.043 33.429	0.996 1.766 1.713 1.887 2.549 3.460 5.256 8.892 11.252 17.529 26.272 38.027	1.060 1.770 1.657 1.887 2.418 3.537 4.820 8.413 11.161 17.500 22.466 41.184	1.035 1.525 1.647 1.694 2.055 3.195 4.809 6.695 9.951 13.810 18.545 25.987	0.997 1.442 1.487 1.471 2.195 2.860 4.309 6.361 10.156 11.960 19.732 21.831
	1937	1938	1939	1940	1941	1942	1943
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.	0.891 1.484 1.564 1.295 1.632 2.841 3.475 5.705 10.075 14.392 22.055 48.235	0.980 1.249 1.293 1.329 1.538 2.563 3.450 5.466 9.143 13.281 21.588 27.291	0.822 1.357 1.110 1.169 1.470 2.263 3.600 5.159 9.169 14.679 14.406 20.937	0.701 1.167 1.190 1.060 1.537 1.904 3.405 4.697 7.980 12.526 16.191 15.759	0.570 1.137 1.148 1.021 1.278 2.011 2.865 4.889 7.306 10.575 12.610 28.027	0.724 1.114 0.846 0.951 1.156 1.886 2.837 4.706 8.479 11.405 18.457 18.462	0.585 0.759 0.750 0.961 1.187 1.838 2.796 4.166 7.351 8.533 11.003 21.693
	1944	1945	1946 1947		1948	1949	1950
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	0.692 0.912 0.816 0.964 1.216 1.913 2.594 4.235 6.807 10.051 11.380 13.829	0.634 0.720 0.707 1.053 1.245 1.612 2.533 3.533 5.630 9.062 12.600 23.281	0.631 1.250 1.108 0.988 1.177 1.586 2.690 4.290 5.763 9.810 12.357 14.591	0.615 0.891 0.808 0.856 1.043 1.628 2.627 4.098 6.114 8.131 12.091 22.913	0.538 0.974 0.756 0.918 0.961 1.542 2.435 4.118 5.246 9.129 12.684 25.973	0.528 0.972 0.790 0.905 0.985 1.613 2.359 3.689 5.818 10.270 13.578 15.010	0.485 0.721 0.807 0.704 1.087 1.578 2.584 4.315 5.696 7.799 13.213 30.055
Ages at Issue		19	1951 Ages at Issue			1951	
10-14 0.510 40-44 15-19 0.802 45-49 20-24 0.827 50-54 25-29 0.754 55-59 30-34 0.876 60-64 35-39 1.534 65 and over							2.368 4.242 5.651 8.002 11.805 25.724

^{*} Excludes war deaths.

TABLE F

EXPERIENCE* OF THE SIXTH TO FIFTEENTH POLICY YEARS ON STANDARD MEDICALLY EXAMINED ISSUES BETWEEN 1939 AND 1951 ANNIVERSARIES

MORTALITY RATE PER 1,000 BY APPROXIMATE ATTAINED AGE

BASED ON AMOUNT OF INSURANCE

Approximate	EXPERIENCE IN POLICY YEAR ENDING IN:								
ATTAINED AGES	1940	1941	1942	1943	1944	1945	1946		
17-19	1.043	1.090	1.066	0.820	0.673	0.369	1.040		
20-24	1.470	1.365	1.291	1.048	0.993	0.464	1.933		
25-29	1.496	1.475	1.283	1.137	1.174	1.061	1.616		
30-34	1.724	1.862	1.546	1.322	1.403	1.333	1.499		
35-39	2.304	2.189	2.129	2.154	1.958	1.964	1.830		
40-44	. 100	3.750	3.560	3.317	3.490	2.978	3.049		
45-4 9	6 446	5.974	5.501	5.198	5.577	5 286	5.03.		
50-54	10.181	9 997	9.462	8.837	8.610	8.483	7.901		
55 –59	16.399	14.992	14.878	13.285	13.445	12.135	13.063		
60-64	25.085	22.492	20.214	20.711	19.255	19.181	18.823		
65-69		37.594	34.766	33.558	30.005	31.146	25.699		
70-74	52.827	50.344	48.489	50.235	52.344	54.501	36.96		
75 and over	85.159	78.036	73.656	57.395	124.098	72.007	59.393		
	1947	1948	1949	1950	1951		· · · · · · · · · · · · · · · · · · ·		
17-19		1.017	0.891	0.699	0.899				
20-24		1.015	1.008	1.072	0.839				
25-29.		1.012	0.998	0.967	0.962	1			
30-34		1.167	1.197	1.077	1.069	ĺ			
35-39	1.788	1.849	1.752	1.694	1.653				
40-44		2.933	2.937	3.057	2.988				
45-49		4.907	5.021	4.732	4.887				
50-54		8.002	8.003	7.653	7.538				
55-59		12.147	11.887	11.335	11.108				
6064		17.178	17.879	17.444	14.847				
65-69		26.417	25.994	24.805	25.427				
70-74		40.422	37.688	37.752	35.497				
75 and over	75.296	72.045	60.811	52.913	47.655				

^{*} Excludes war deaths.

TABLE G

EXPERIENCE* OF THE SIXTEENTH AND SUBSEQUENT POLICY YEARS ON STANDARD ISSUES BETWEEN 1939 AND 1951 ANNIVERSARIES MORTALITY RATE PER 1,000 BY ATTAINED AGE BASED ON AMOUNT OF INSURANCE

ATTAINED	EXPERIENCE IN POLICY YEAR ENDING IN:									
AGES	1940	1941	1942	1943	1944	1945	1946			
<u> </u>	2 220	2.040	2 720	1 040	1.60	2.556	2 001			
25-29	2.330	2.240	2.330	1.849	1.669	2.556	2.221			
30-34	2.229	2.212	1.964	2.131	1.796	1.930	2.154			
35-39	2.768	2.805	2.438	2.169	2.468	2.501	2.442			
40-44	4.090	3.966	3.588	3.671	3.784	3.444	3.309			
45-49	7.103	6.878	6.095	6.340	6.592	5.749	6.309			
50-54	11.426	10.654 17.894	10.609	10.351	10.065	10.158	9.705			
55-59	17.693		16.447	15.936	15.929	15.565	15.486			
60-64	29.686	27.887	26.969	26.912	25.329	25.194	24.480			
65~69	40.416	42.441	39.734	40.744	38.430	37.059	36.472			
70~74	59.652	58.280	57.051	59.551	58.008	58.820	54.614			
75-79	84.861	88.002	84.181	86.018	86.991	81.537	81.423			
80–84	138.824	136.565	126.671	145.419	128.862	129.140	116.370			
85-89	219.500	200.341	182.010	172.150	189.563	164.506	169.952			
90–95	231,115	231.435	283.144	233.235	240.482	181.520	225.498			
	1947	1948	1949	1950	1951					
25-29	1.079	1.166	1.106	1.223	1.176					
30-34	1.728	1.443	1.415	1.205	1.404					
35-39	1.970	2.055	2.050	1.881	1.721					
40-44	3.135	3.474	3.298	3.237	3.635					
45-49	5.845	5.639	5.614	5.474	5.557					
50-54	9.473	9.606	9.379	9.671	9.072					
55-59	15.926	16, 221	15.347	14.926	14.435					
60-64	25.039	24.750	24.663	24.177	23.358					
65-69	35.642	39.282	36.846	35.251	34.705					
70-74	54.084	55.855	52.009	53.337	54.352					
75-79	86.212	86.538	77.213	83.436	74.119					
80-84	124,120	110.526	118.458	108.486	117.287					
85–89	167.006	182.369	177.252	141.730	173.953					
90-95	263.686	267.796	204.077	234.196	244,450					

^{*} Excludes war deaths.