

TRANSACTIONS OF SOCIETY OF ACTUARIES 1953 REPORTS

SECTION II. GROUP ACCIDENT AND HEALTH INSURANCE, INCLUDING GROUP HOSPITAL AND SURGICAL EXPENSE INSURANCE

THIS is the sixth report in a series of annual studies of the morbidity experience of Group Accident and Sickness insurance and Group Employee and Dependent Hospital and Surgical Expense insurance.

The following Group Hospital Expense insurance benefits have been analyzed by the Committee for the first time this year:

- a)* Employee, 31 day, 14 + 20×, 20×, Fixed Benefit plan.
- b)* Employee, 70 day, 14 + 10×, 10×, Fixed Benefit plan.
- c)* Employee, 31 day, 10×, 20×, Reimbursement plan.
- d)* Employee, 31 day, 14 + 10×, 10×, Reimbursement plan.
- e)* Dependent, 31 day, 10× Maternity, 20×, 9 Months Maternity Waiting Period, Reimbursement plan.
- f)* Dependent, 70 day, 10× Maternity, 20×, 9 Months Maternity Waiting Period, Reimbursement plan.

The abbreviations used in these descriptions are similar to those used for the plans which have been analyzed in previous years and hence need no further explanation. The four new Employee benefit plans are shown in Table III*b*; the two new Dependent benefit plans are shown in Table V*b*.

The Committee is continuing this year to study the experience under the \$200 Surgical Schedule described for the first time in its last year's report.

The crude annual claim costs shown in this report for all plans, except for the \$200 Surgical Schedule and the six new Hospital Expense plans, have been derived from the experience of the five policy years ending in the calendar years 1948 to 1952, inclusive, for six out of the eight contributing companies. For the remaining two companies, the experience of the five policy years ending July 1, 1947 to June 30, 1952, inclusive, has been used for that purpose. The experience of only the last two years of these periods is available for the \$200 Surgical Schedule plans. The experience of only the last year of these periods is available for the six new Hospital Expense plans. The term "experience unit" as used in this report is defined as a policy year's experience of an insured group.

TABLE I
 COMBINED 1948-52 POLICY YEARS EXPERIENCE
 GROUP ACCIDENT AND SICKNESS INSURANCE
 WITH 6 WEEKS MATERNITY BENEFIT
 NONRATED INDUSTRIES

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FEMALE PERCENT	NUMBER OF EXPERIENCE UNITS	WEEKLY INDEMNITY EXPOSED	CLAIMS	ANNUAL CLAIM COST*	NUMBER OF EXPERIENCE UNITS	WEEKLY INDEMNITY EXPOSED	CLAIMS	ANNUAL CLAIM COST*
13-WEEK PLANS								
1st Day Accident and 4th Day Sickness				4th Day Accident and 4th Day Sickness				
<11%	6,206	16,874,600	9,842,874	\$.58	950	4,746,050	2,705,989	\$.57
11- 21	2,471	7,850,040	5,124,701	.65	438	3,787,470	2,355,712	.62
21- 31	1,098	5,470,950	4,049,590	.74	209	663,770	472,217	.71
31- 41	439	2,077,450	1,717,360	.83	122	530,390	451,811	.85
41- 51	281	1,050,840	815,746	.78	56	188,520	122,664	.65
51- 61	200	349,390	334,914	.96	42	113,340	88,081	.78
61- 71	129	338,800	336,988	.99	37	126,780	101,152	.80
71- 81	67	279,340	257,464	.92	29	96,310	89,303	.93
81- 91	60	114,960	106,137	.92	8	20,670	21,086	1.02
91-100	20	15,550	15,102	.97	6	12,420	8,510	.69
Total	10,971	34,421,920	22,600,876	.....	1,897	10,285,720	6,416,525	.....
1st Day Accident and 8th Day Sickness				8th Day Accident and 8th Day Sickness				
<11%	13,806	50,944,470	24,907,187	\$.49	3,201	25,120,790	12,681,317	\$.50
11- 21	6,397	24,861,050	13,518,120	.54	1,762	17,806,000	9,789,471	.55
21- 31	3,359	16,221,730	10,194,585	.63	964	15,529,630	10,359,393	.67
31- 41	2,210	10,220,690	7,414,845	.73	775	6,552,020	4,197,931	.64
41- 51	1,466	6,125,430	4,623,446	.75	574	3,907,170	3,062,293	.78
51- 61	1,079	3,846,770	3,212,344	.84	358	1,754,220	1,397,625	.80
61- 71	750	2,479,480	2,076,443	.84	322	1,293,120	1,045,220	.81
71- 81	503	1,328,910	1,203,811	.91	228	975,660	827,857	.85
81- 91	313	750,850	769,499	1.02	165	693,240	622,095	.90
91-100	69	167,760	130,169	.78	41	59,090	93,920	1.59
Total	29,952	116,947,140	68,050,449	.....	8,390	73,690,940	44,077,122	.....
26-WEEK PLANS								
1st Day Accident and 8th Day Sickness				8th Day Accident and 8th Day Sickness				
<11%	1,148	14,856,550	10,429,671	\$.70	657	10,401,440	6,714,206	\$.65
11- 21	406	5,302,020	3,669,085	.69	302	4,002,990	2,696,438	.67
21- 31	167	2,120,500	1,586,818	.75	164	4,332,110	3,238,395	.75
31- 41	93	532,580	509,774	.96	80	488,780	380,797	.78
41- 51	72	363,220	380,055	1.05	47	309,620	262,811	.85
51- 61	37	194,950	161,154	.83	25	65,230	52,424	.80
61- 71	13	45,230	51,411	1.14	16	55,940	59,988	1.07
71- 81	2	29,360	42,579	1.45	1	950	880	.93
81- 91	1	1,050	1,878	1.79	4	15,080	10,970	.73
91-100	2	1,140	1,641	1.44	1	1,320	1,497	1.13
Total	1,941	23,446,600	16,834,066	.....	1,297	19,673,460	13,418,406	.....

* Per \$1.00 of Exposure.

In compiling this report, the Committee has included the combined experience of employer-employee groups regardless of whether the groups had more or less than 50 lives at issue. The experience of insured groups outside of the continental United States, as well as that of trusteeship and association cases insuring employees of member employers of the trusteeship or association and of union cases, whether or not insurance depends on continued employment, has been excluded.

Tables I, III*a* and III*b* of this report for Accident and Sickness and Employee Hospital Expense present the crude annual claim costs of all groups in those industrial classifications which the contributing companies individually rate standard for premium purposes. These tables are

TABLE II
GROUP ACCIDENT AND SICKNESS INSURANCE
NONRATED INDUSTRIES
SECULAR TREND
RATIOS OF ACTUAL CLAIMS TO AVERAGE
CLAIMS ON 1948-1952 BASIS

Policy Year Experience	1-4-13 and 4-4-13 Plans	1-8-13 and 8-8-13 Plans	1-8-26 and 8-8-26 Plans	All Plans
1947.	111%	105%	111%	107%
1948.	102	101	106	102
1949.	100	100	101	100
1950.	97	97	100	98
1951.	98	97	95	97
1952.	103	103	100	102

headed "Nonrated Industries." Table IV for Employee Surgical Expense, Tables Va and Vb for Dependent Hospital Expense, and Table VI for Dependent Surgical Expense contain the crude claim costs of all groups regardless of industrial classification. These tables are headed "All Industries."

In reviewing the results of Tables IV and VI, it should be remembered that the annual claim costs for the \$150 Schedule are based on the experience of 1948-1952, while those for the \$200 Schedule are based on the experience of 1951-1952. The figures for the \$150 Schedule given in Table VII show how misleading it would be to compare directly the claim costs for the two Surgical Schedules given in Tables IV and VI. A more valid comparison can be obtained from Table IX, described below. Similar caution should be used in comparing the 1948-1952 annual claim costs shown in Tables III*a* and Va with the 1952 annual claim costs shown in Tables III*b* and Vb, respectively.

TABLE IIIa
 COMBINED 1948-52 POLICY YEARS EXPERIENCE†
 EMPLOYEE GROUP HOSPITAL EXPENSE INSURANCE
 NONRATED INDUSTRIES

FEMALE PERCENT	FIXED BENEFIT PLANS											REIMBURSEMENT PLAN				
	31 Day, 14+5X, 5X				31 Day, 14+10X, 10X				70 Day, 14+5X, 5X			31 Day, 10X, 10X				
	Number of Ex- perience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Ex- perience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Ex- perience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Ex- perience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*
<11% . . .	6,550	5,948,984	5,347,839	\$.90	4,902	6,061,449	6,995,341	\$1.15	1,191	1,516,198	1,578,491	\$1.04	2,120	1,716,980	1,919,840	\$1.12
11- 21 . . .	3,969	4,660,746	4,472,937	.96	2,557	3,176,212	3,710,773	1.17	855	1,301,170	1,436,080	1.10	1,059	984,593	1,125,571	1.14
21- 31 . . .	2,548	3,202,728	3,378,153	1.05	1,392	2,090,262	2,661,872	1.27	502	816,788	895,621	1.10	630	845,163	925,156	1.09
31- 41 . . .	1,888	3,106,759	3,561,566	1.15	936	1,408,698	1,927,637	1.37	313	357,346	427,799	1.20	402	339,576	433,545	1.28
41- 51 . . .	1,398	1,406,988	1,634,679	1.16	634	773,436	1,209,515	1.56	240	305,358	400,293	1.31	288	239,758	330,593	1.38
51- 61 . . .	1,026	1,190,762	1,457,827	1.22	415	521,696	860,954	1.65	189	215,343	278,360	1.29	260	220,323	329,992	1.50
61- 71 . . .	752	672,115	833,858	1.24	267	396,416	698,606	1.76	138	113,166	170,274	1.50	195	141,615	219,631	1.55
71- 81 . . .	640	575,305	789,771	1.37	225	275,633	498,858	1.81	94	127,625	183,197	1.44	106	102,141	165,329	1.62
81- 91 . . .	452	316,976	431,300	1.36	95	115,246	207,605	1.80	65	59,385	91,016	1.53	90	56,680	108,598	2.12
91-100 . . .	157	132,986	207,312	1.56	28	15,993	40,314	2.52	20	8,834	11,891	1.35	29	24,090	51,660	2.14
Total . . .	19,380	21,214,349	22,115,242	.....	11,451	14,835,041	18,811,475	.....	3,607	4,821,213	5,473,022	.....	5,179	4,670,919	5,609,915	.....

† See text for caution about comparison with Table IIIb.

* Per \$1.00 of Exposure.

TABLE IIIb
1952 POLICY YEAR EXPERIENCE†
EMPLOYEE GROUP HOSPITAL EXPENSE INSURANCE
NONRATED INDUSTRIES

FEMALE PERCENT	FIXED BENEFIT PLANS								REIMBURSEMENT PLANS							
	31 Day, 14+20X, 20X				70 Day, 14+10X, 10X				31 Day, 10X, 20X				31 Day, 14+10X, 10X			
	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*
<11%.....	94	131,699	186,723	\$1.42	306	616,596	883,547	\$1.43	167	157,262	220,447	\$1.40	169	109,975	127,313	\$1.16
11- 21.....	56	207,647	362,047	1.74	193	427,364	666,031	1.56	82	114,457	179,652	1.57	70	165,358	227,274	1.37
21- 31.....	37	62,642	111,935	1.79	90	103,066	165,565	1.61	36	28,336	46,380	1.64	31	100,365	129,156	1.29
31- 41.....	15	41,916	89,845	2.14	64	132,182	205,782	1.56	32	29,851	44,688	1.50	26	226,627	281,236	1.24
41- 51.....	13	28,496	50,968	1.79	39	39,702	67,966	1.71	15	19,509	25,461	1.31	18	28,437	42,563	1.50
51- 61.....	12	19,473	42,761	2.20	30	22,285	35,450	1.59	12	12,598	25,014	1.99	19	23,650	44,760	1.89
61- 71.....	5	2,622	5,903	2.25	25	26,773	55,829	2.09	10	6,350	14,602	2.30	13	42,432	65,559	1.55
71- 81.....	2	1,163	2,867	2.47	17	9,371	23,560	2.51	4	3,004	5,546	1.85	5	6,351	12,321	1.94
81- 91.....	1	599	1,580	2.64	6	5,995	16,134	2.69	1	4,651	13,982	3.01	3	1,146	3,042	2.65
91-100.....	1				1	330	554	1.68	1	298	516	1.73	1	2,467	4,721	1.91
Total.....	235	496,257	854,629		771	1,383,664	2,120,418		360	376,316	576,288		355	706,808	937,945	

† See text for caution about comparison with Table IIIa.

* Per \$1.00 of Exposure.

TREND OF EXPERIENCE

In order to analyze the secular trend underlying the accumulated five years' experience which is shown in Tables I, IIIa, IV, Va, and VI, as well as the 1947 experience described in last year's report, ratios of actual claims to average claims on the 1948-1952 basis (nonrated industries where applicable) were obtained for the individual policy years. These ra-

TABLE IV
EMPLOYEE GROUP SURGICAL EXPENSE INSURANCE
WITH OBSTETRICAL BENEFITS
ALL INDUSTRIES

FEMALE PERCENT	COMBINED 1948-52 POLICY YEARS EXPERIENCE†				COMBINED 1951-52 POLICY YEARS EXPERIENCE†			
	\$150 SCHEDULE				\$200 SCHEDULE			
	Num- ber of Expe- rience Units	Maximum Indemnity Exposed per \$150 Basic Unit	Claims	An- nual Claim Cost*	Num- ber of Expe- rience Units	Maximum Indemnity Exposed per \$200 Basic Unit	Claims	An- nual Claim Cost*
<11% . . .	18,385	4,246,215	12,308,252	\$2.90	2,884	797,879	3,250,733	\$4.07
11- 21 . . .	10,502	2,875,043	9,658,184	3.36	1,341	426,430	1,984,067	4.65
21- 31 . . .	6,300	2,301,898	8,830,776	3.84	649	205,162	1,012,947	4.94
31- 41 . . .	4,525	1,422,292	5,872,461	4.13	395	92,547	502,887	5.43
41- 51 . . .	3,163	930,763	4,373,773	4.70	315	87,721	535,342	6.10
51- 61 . . .	2,335	654,198	3,162,777	4.83	239	75,690	481,725	6.36
61- 71 . . .	1,673	335,820	1,740,644	5.18	168	41,424	302,772	7.31
71- 81 . . .	1,206	290,908	1,644,921	5.65	86	13,645	91,566	6.71
81- 91 . . .	816	185,576	1,149,104	6.19	40	6,237	49,791	7.98
91-100 . . .	284	36,610	244,705	6.68	6	690	4,283	6.21
Total . . .	49,189	13,279,323	48,985,597	.....	6,123	1,747,425	8,216,113	.....

† See text for caution about comparison of annual claim costs of the two schedules.

* Per Basic Unit Exposed.

tios are presented in Tables II and VII. For an employee plan of insurance, the average claims for each of the six years were obtained by applying the crude claim costs of the accumulated 1948-1952 data for each female percentage grouping to the corresponding exposure of that year. For a dependent plan of insurance, the average claims for any one year were obtained by applying the crude claim cost derived from the accumulated 1948-1952 experience of the plan to the entire exposure of that year. The analysis has been shown for all exposure size groupings for individual plans or combinations of plans, as well as for all plans combined under each coverage.

TABLE Va
 COMBINED 1948-52 POLICY YEARS EXPERIENCE†
 DEPENDENTS GROUP HOSPITAL EXPENSE INSURANCE
 ALL INDUSTRIES

Plan Identification	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*
Reimbursement Plans with No Maternity Benefit				
31 Day, 5×	1,202	904,630	1,712,478	\$1.89
31 Day, 10×	1,341	1,917,770	4,439,863	2.32
70 Day, 5×	270	156,002	303,978	1.95
Reimbursement Plans with 10× Daily Benefit for Maternity				
31 Day, 5×				
No Maternity Waiting Period	372	369,263	1,025,948	2.78
31 Day, 5×				
9 Months Maternity Waiting Period	7,766	4,412,144	11,163,643	2.52
31 Day, 10×				
9 Months Maternity Waiting Period	10,080	7,630,104	23,092,340	3.05
70 Day, 5×				
9 Months Maternity Waiting Period	502	370,160	1,018,532	2.75
70 Day, 10×				
9 Months Maternity Waiting Period	1,157	1,620,370	5,493,730	3.39
Fixed Benefit Plan with 10× Daily Benefit for Maternity				
31 Day, 5×				
9 Months Maternity Waiting Period	562	1,064,691	2,735,927	2.57

† See text for caution about comparison with Table Vb.

* Per \$1.00 of Exposure.

TABLE Vb
 1952 POLICY YEAR EXPERIENCE†
 DEPENDENTS GROUP HOSPITAL EXPENSE INSURANCE
 ALL INDUSTRIES

Plan Identification	Number of Experience Units	Daily Benefit Exposed	Claims	Annual Claim Cost*
Reimbursement Plans with 10× Daily Benefit for Maternity				
31 Day, 20×				
9 Months Maternity Waiting Period	729	672,425	2,462,747	\$3.66
70 Day, 20×				
9 Months Maternity Waiting Period	238	586,582	2,291,352	3.91

† See text for caution about comparison with Table Va.

* Per \$1.00 of Exposure.

TABLE VI
DEPENDENTS GROUP SURGICAL EXPENSE INSURANCE
ALL INDUSTRIES

PLAN	COMBINED 1948-52 POLICY YEARS EXPERIENCE †				COMBINED 1951-52 POLICY YEARS EXPERIENCE †			
	\$150 SCHEDULE				\$200 SCHEDULE			
	Number of Experience Units	Maximum Indemnity Exposed per \$150 Basic Unit	Claims	Annual Claim Cost*	Number of Experience Units	Maximum Indemnity Exposed per \$200 Basic Unit	Claims	Annual Claim Cost*
No Obstetrical Benefits.....	3,998	788,480	6,635,952	\$ 8.42	590	147,216	1,539,056	\$10.45
With Obstetrical Benefits 9 Months Waiting Period..	14,807	2,350,203	29,030,644	12.35	3,533	712,829	10,196,448	14.30

† See text for caution about comparison of annual claim costs of the two schedules.
* Per Basic Unit Exposed.

TABLE VII
GROUP HOSPITAL AND SURGICAL EXPENSE INSURANCE
SECULAR TREND
RATIOS OF ACTUAL CLAIMS TO AVERAGE CLAIMS ON 1948-1952 BASIS

POLICY YEAR EXPERIENCE	EMPLOYEE HOSPITAL EXPENSE, NONRATED INDUSTRIES			EM- PLOYEE SURGICAL EXPENSE \$150 SCHEDULE	DEPENDENT HOSPITAL EXPENSE			DEPENDENT SURGICAL EXPENSE \$150 SCHEDULE		
	All 5× Plans*	All 10× Plans*	All Plans*		All 5× Plans†	All 10× Plans†	All Plans†	No Obstetrical Benefits	With Obstetrical Benefits	Both Plans
1947....	97%	82%	95%	89%	93%	85%	92%	92%	90%	91%
1948....	98	90	96	94	98	91	95	95	94	95
1949....	97	94	96	98	99	95	97	94	97	96
1950....	99	99	99	99	100	98	99	100	99	100
1951....	105	103	104	102	101	102	102	106	103	103
1952....	109	109	109	108	105	104	104	106	102	102

* Published in Table IIIa.
† Published in Table Va.

The analysis contained in Table II shows that the Group Accident and Sickness experience of the last year has reversed the trend toward more favorable experience exhibited between 1947 and 1950 and has, in fact, worsened considerably since 1951.

Table VII for Group Hospital and Surgical Expense insurance shows (except for Dependents Surgical Expense insurance) a continuation of the general trend toward higher claim costs which has been noted in previous reports. In connection with the trend results shown for the 5 times special charges groupings of Hospital Expense insurance plans, it should be mentioned that the volume of exposure for these groupings has decreased, in the case of Employee Hospital Expense insurance, for the last four policy years included in this report and in the case of Dependents Hospital Expense insurance, for the last three policy years.

DISPERSION OF CLAIM COSTS

The Committee has commented in past reports on some of the limitations of the data contained in the basic tables. Those limitations arise out of the fact that practical considerations make it impossible to classify and analyze the experience according to all of the many factors which affect morbidity. Accordingly, the results contained in the basic tables represent the composite experience of insured groups having various geographical locations, industrial classifications, distributions of exposure by age, different types of claim administration, levels of benefits, and other tangible and intangible distinguishing characteristics. Such factors, together with chance fluctuations, give rise to a dispersion of claim costs among the various individual experience units included in this composite experience, and the Committee has undertaken to study the extent of this dispersion for Employee Surgical Expense insurance, which affords a considerable volume of exposure under a single benefit plan (as compared with the much smaller volume of exposure under any one Hospital Expense insurance plan).

Table VIII is an analysis of the distribution for various exposure size groups of the claim costs experienced under the \$150 Employee Surgical Schedule during the 1951 policy year. The entries in the table are the percentages of the number of experience units which had annual claim costs less than the indicated multiples of average annual claim costs. In order to obtain these figures, the claim costs for all exposure size groupings combined were calculated separately for each female percent bracket. The expected claims for each experience unit were then calculated by applying the claim costs derived for the appropriate female percent bracket to the exposure on that experience unit. The ratio of actual to

expected claims was obtained for each experience unit. These ratios were then grouped into the categories shown in Table VIII.

The distribution of the ratios of actual to expected claims obtained for each exposure size grouping is a function of both the variation of claim costs of experience units falling into that exposure size grouping and the number of such experience units which happened to be included in the analysis. The number of experience units in some of the exposure size groupings was too small to give reliable indications of distribution and

TABLE VIII
DISTRIBUTION ANALYSIS
EMPLOYEE GROUP SURGICAL EXPENSE INSURANCE
\$150 SCHEDULE
1951 POLICY YEAR EXPERIENCE
ALL FEMALE PERCENTAGE GROUPINGS—ALL INDUSTRIES

MULTIPLES OF AVERAGE ANNUAL CLAIM COST	PERCENTAGE OF NUMBER OF EXPERIENCE UNITS WITH ANNUAL CLAIM COST LESS THAN MULTIPLES OF AVERAGE ANNUAL CLAIM COST					
	Exposure Size Groupings					
	0	1	2	3	4-9	0-9
.60	58.6%	45.7%	37.2%	25.1%	11.8%	33.7%
.80	64.2	53.4	48.5	42.6	31.1	46.6
1.00	68.8	62.4	60.5	60.2	57.3	61.0
1.20	73.7	70.2	71.5	74.1	77.7	73.1
1.40	76.8	75.9	79.5	84.3	89.6	81.4
1.60	79.6	81.5	85.9	91.4	94.9	87.2
1.80	83.6	86.2	90.3	95.2	97.4	91.1
2.00	85.7	89.0	93.3	97.1	99.0	93.5
3.00	93.1	97.1	98.8	99.9	99.9	98.3
Over 3.00	100.0	100.0	100.0	100.0	100.0	100.0
Total Number of Ex- perience Units.....	824	2,060	2,368	1,996	1,638	8,886

it was, therefore, necessary to combine the data for exposure size groupings 4-9, inclusive. Appropriate statistical calculations indicate that the effect of the varying number of experience units has been largely eliminated by the combination of exposure size groupings 4-9.

There remains the effect of the variation of claim costs. This variation is a function partly of the differing characteristics of the experience units and their plans of benefits and partly of chance fluctuations. Since only one year's experience is included, chance fluctuations of some magnitude may occur. The effect of these chance fluctuations is, of course, much less

for the larger experience units included in exposure size groupings 4-9. It is probable that the observation of each unit for several years would reduce the effect of chance fluctuations for the smaller exposure size groupings also. It is possible that, if the smaller units were observed individually over a sufficiently long period, the total fluctuations would be reduced to the level now shown for exposure size groupings 4-9. Such additional experience would almost certainly reduce the percentage of units having less than 60% of the average annual claim costs for exposure size grouping 0. Because of the limitations of the currently available data, the Committee has no practical way of combining the experience of several years for individual units, nor has it any practical way of combining the experience of the various coverages that may be provided under individual insured group policies. Nevertheless, Table VIII highlights the fact that there is a wide range of costs among the various insured groups. Consequently, it serves as a warning that many groups have greater claim costs than the averages shown in Tables I, III, IV, V and VI.

MALE AND FEMALE COSTS

The Committee has, since the inception of its reports, considered the problems connected with the determination of average male and female costs for the experience of the various employee plans of insurance. As commented on previously, the experience of any particular plan of insurance represents the composite experience of insured groups whose claim costs differ because of differences in such factors as geographical location, industrial classification, etc. The resulting lack of homogeneity by plan produces inconsistencies when average male and female claim costs are derived for the several plans of Accident and Sickness and Employee Hospital Expense insurance. This lack of homogeneity may also be partly responsible for some of the inconsistencies that appear in the claim costs shown for the various Dependent Hospital Expense insurance plans.

Therefore, in constructing consistent basic morbidity tables by type of claimant (the only tables suitable for such purposes as interpolation for unusual plans of insurance), it is necessary to use a graduation process, involving the exercise of judgment. The construction of such tables is best accomplished with the aid of detailed claim information, such as the relative frequency of female maternity and nonmaternity claims and the average duration of claims by type of claimant and by cause (*i.e.*, maternity and nonmaternity). It is not practicable to obtain and process such detailed claim information annually and perform the necessary graduation in sufficient time to include the results in the Committee's annual reports. However, the Committee has arranged in the past to have special

investigations of this type prepared. These were used as the basis of Mr. Morton D. Miller's paper entitled "Group Weekly Indemnity Continuation Table Study," *TSA III*, and Mr. Stanley W. Gingery's paper entitled "Special Investigation of Group Hospital Expense Insurance Experience," *TSA IV*.

While satisfactorily consistent average male and female costs cannot be obtained directly from the crude experience data shown in its reports, the Committee recognizes the need for the summarization of those data to facilitate comparisons of the experience for the various plans of insurance, as well as to facilitate comparisons with other data. The only method of summarization which the Committee has found practicable to use is based on the use of parameters which correspond to the usual type of average male and female claim costs and which reproduce the crude claim costs in total. Such male and female parameters have been derived, together with a parameter ratio (female divided by male), and are shown in Table IX.

The parameters shown in Table IX were obtained by solving two simultaneous equations. One equation expresses the condition that the sum of the products of the male and female parameters multiplied by the male and female exposures, respectively, for the whole plan must equal the total claims. The second equation expresses the condition that the sum of the products of the male and female parameters multiplied by the male and female exposures, respectively, in the less than 11% female bracket equals the claims for that bracket.

The parameters were derived using the combined experience of as many, up to 5, years as were available, from the experience of exposure size groups 0-7. This was done because test calculations indicated that the results for groups 0-7 were more consistent than those based on experience which included the jumbo size groups. The parameters so derived were then multiplied by factors which adjusted them to reproduce the crude claim costs of all exposure size groups for the 1952 policy year. The initial use of exposure size groups 0-7 and of several policy years accomplished a partial graduation of the results.

It should be noted that the male and female parameters shown in Table IX are valuable only to the extent that they can be used in determining total claim costs for each female percentage grouping. Tests have been made on the basis of the 0-7 size groupings which show that the parameters give satisfactory results for nearly all plans of insurance. In the case of the 1-8-26 week Accident and Sickness plan of insurance and in the case of the 31 day, 10X, 10X, Reimbursement Employee Hospital Expense plan of insurance, the results were somewhat less satisfactory in

TABLE IX
ANALYSIS OF MALE AND FEMALE EXPERIENCE
1952 POLICY YEAR EXPERIENCE
NONRATED INDUSTRIES—ALL EXPOSURE SIZES

PLAN	EXPOSURE SIZE GROUPINGS			MALE PA- RAME- TER	FE- MALE PA- RAME- TER	PA- RAME- TER RATIO
	0-7		0-9			
	Amount Exposed	Fe- male Per- centage of Total Expo- sure	Fe- male Per- centage of Total Expo- sure			
Accident and Sickness Insurance	<11% 14,003,640 Σ 25,605,740	15	15	.563	1.258	223%
1-4-13	<11% 3,174,870 Σ 5,207,990	17	15	.567	1.096	193
1-8-13	<11% 33,966,770 Σ 39,202,570	21	20	.470	1.161	217
8-8-13	<11% 13,314,920 Σ 36,659,530	23	22	.496	1.102	222
1-8-26	<11% 5,342,280 Σ 9,437,590	14	11	.663	1.225	185
8-8-26	<11% 2,843,600 Σ 5,458,540	15	13	.614	.969	158
Employee Hospital Expense						
31 Day, 14+5X, 5X, Fixed Benefit...	<11% 4,150,360 Σ 14,209,312	28	27	.936	1.675	179
31 Day, 14+10X, 10X, Fixed Benefit...	<11% 3,792,549 Σ 9,958,914	23	22	1.157	2.281	197
70 Day, 14+5X, 5X, Fixed Benefit...	<11% 976,025 Σ 3,232,147	25	28	1.088	1.768	163
31 Day, 10X, 10X, Reimbursement...	<11% 1,365,113 Σ 3,710,260	24	22	1.104	1.947	176
31 Day, 14+20X, 20X, Fixed Benefit...	<11% 114,373 Σ 311,777	21	19	1.464	2.916	199
70 Day, 14+10X, 10X, Fixed Benefit...	<11% 309,391 Σ 727,081	20	17	1.365	2.363	173
31 Day, 10X, 20X, Reimbursement...	<11% 132,609 Σ 302,621	20	19	1.393	2.145	154
31 Day, 14+10X, 10X, Reimbursement	<11% 109,975 Σ 318,170	25	28	1.105	2.105	190
Employee Surgical Expense						
\$150 Schedule.....	<11% 2,797,127 Σ 8,252,121	25	24	2.805	7.724	275
\$200 Schedule.....	<11% 473,127 Σ 1,051,817	20	18	3.705	9.487	256

that the crude claim costs for exposure groups 0-7 showed a tendency to increase by percentage female grouping somewhat more than did the claim costs produced by the use of the parameters.

Because of the inconsistencies by plans of insurance exhibited by the parameters shown in Table IX, a second set was calculated by the Committee using the least squares method. A comparison of the two sets of results indicated little variation in the male parameter. Thus the inconsistencies by plan of insurance exhibited by the male parameters must be due primarily to the underlying variation in claim costs referred to previously, rather than to the choice of the calculation method. On the other hand, because of the relatively small volume of exposure on female lives (varying from $\frac{1}{3}$ to $\frac{1}{5}$ of the total exposure) the choice of the calculation method has a somewhat greater influence on the female parameter and the parameter ratio than it has on the male parameter.

The following companies contributed experience for the investigation covered in this report:

- Aetna Life Insurance Company
- Connecticut General Life Insurance Company
- Continental Assurance Company
- Equitable Life Assurance Society
- John Hancock Mutual Life Insurance Company
- Metropolitan Life Insurance Company
- Prudential Insurance Company of America
- The Travelers Insurance Company