EXCESS LOSS RATIOS VIA LOSS DISTRIBUTIONS

BY

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Modifications of the retrospective rating procedures were adopted this year by the National Council on Compensation Insurance. These modifications included the optional provision of limiting ratable losses to stated amounts of $10,000, $15,000, or $25,000, per accident. With such loss limitations, the adopted retrospective premium formula can be expressed as follows: Retrospective premium = basic premium + expected excess losses and claim expense + limited losses and claim expense, subject to the tax multiplier and the appropriate minimum and maximum premium limits.

This paper is intended to describe the method adopted by the Actuarial Committee to determine the expected excess loss portion of this formula. The practical aspects of the problem required the development of a practical and flexible procedure, and the oft-quoted maternal nature of necessity produced a perhaps novel method which may be of general interest, conceivably useful for excess loss problems wherever they may arise.

DESCRIPTION OF END RESULTS

Intuition leads to the conclusion that this material will be more easily understood with a preliminary description of a few Tables, appended, which demonstrate the end product, and its use.

Table I presents the final indicated excess ratios which, when applied to individual state standard premiums, are designed to produce expected excess losses. For Alabama, .6 of 1% of Alabama premiums is equivalent to losses expected to be in excess of $10,000 per accident, and for District of Columbia premiums, 9.3% is required. For the time being, a brief note is necessary: these factors include a calculated *per claim* element, a catastrophe loading of 10% of the per claim element, and a flat catastrophe loading as indicated in the note.

Table II presents certain details in arriving at the factors shown in Table I. In Table II, Columns (2), (5), and (8) give ratios which are entries to Tables III or IV for death cases, Table V for permanent total disability cases, and Table VI for major permanent partials.

For illustration, let us refer to the Indiana values of Table II. The death average value of $6,676 has been calculated from the latest two years of Indiana experience, adjusted to law level. The $10,000 limitation is 50% higher than such average, Column (2), and therefore the entry to Table III is 150%. Table III represents values of a generalized distribution of death cases by size, and leads us to believe that 21.9%, Column (2), of all Indiana death claims will cost an amount equal to, or higher than, 150% of the average cost of all Indiana death claims; i.e., $10,000 or more. These high cost cases would involve 38.60%, Column (3), of total death losses, and the excess ratio, therefore, is 38.6 minus 21.9 $\times$ 1.50, or 5.8% as shown in Column (4).

Similarly, Column (5) of Table II is the entry to Table V; Column (8) the entry to Table VI. We then have ratios of excess losses to total losses, by the

serious injury parts. Weighting these injury ratios by the state portions shown in Columns (10), (11) and (12), the over-all ratios of Column (13) are obtained.

Now it is desired to apply these ratios to individual risks, and as a minimum recognition of risk differences the readily known risk standard premiums were selected as bases to which excess loss *premium* factors would be applied Therefore, multiplication by the state permissible loss ratio underlying standard premiums is necessary, since:

$$\text{Standard Premiums} = \frac{\text{total losses}}{\text{perm. loss ratio}}, \quad \text{and}$$

$$\frac{\text{excess losses} \times \text{perm. loss ratio}}{\text{total losses}} \times \frac{\text{total losses}}{\text{perm. loss ratio}} = \text{excess losses}$$

The distributions of Tables III through VI are for single claims only, and thus no multiple claim values have so far been reflected. This catastrophe element could not be treated formally and the final conclusion was to include part of this element as a 10% loading on the per claim excess indications, to reflect relative benefit levels; thus the 1.10 multiplier in Column (15), and the additional flat loadings shown in Table I, which were selected after a study of catastrophe experiences.

ADVANTAGES OF METHOD

It can be seen that this method allows rather easy revisions of state excess ratios as they may be required, and it is anticipated that the ratios now in effect in many states will be revised periodically. If benefit provisions are amended, the average values used in Table II can be immediately adjusted, with a consequent revision of excess ratios. Also, as new state experiences indicate, as they are now indicating, increasing average costs, the excess ratios can be kept in step. If further tabulations of catastrophe experiences indicate need for adjustment of the catastrophe excess elements, this can easily be done.

The calculations of excess loss ratios, in the past, usually have followed an approach simple in theory but cumbersome in practice, one notable exception being Mr. Elliot's Pennsylvania procedure. In short, this "simple" approach is to tabulate losses by size, adjust each loss as closely as possible to current cost conditions, draw the retention line, compare the excess to total losses, and then, after all that work, use the judgment which is necessary in excess rating problems. To follow that approach for every state, however, appeared impractical for several reasons: First, the relatively lower frequencies of higher cost cases involving excess, particularly catastrophes, require tabulation of quite a few years' experience for each state, for credible results. Second, increasing cost levels have a much greater effect upon losses in excess of a fixed retention value, ratio-wise, than upon total loss volumes, and in these times particularly, excess ratios based upon old loss amounts, without some magical means of adjusting, case by case, to current levels, would be too low. Third, ratios so established can become obsolete merely by enactment of benefit changes, and the only recourse for revision is to repeat the same arduous process. Finally, the anticipated date for introduction of the new retrospective rating procedure did not allow time to do all this.

DEVELOPMENT OF PROCEDURE

Anticipating the need for some short-cut method, the above "simple" approach was followed for a few states selected to provide variance of cost levels and benefit provisions, in the hope that these state excess ratios might lead to a general definition of excess ratios in terms of benefit provisions or average cost levels as parameters. This turned out to be a dead end, however, partly because of occasional catastrophes and high medical costs, and partly because of the ticklish nature of the small excess ratios, and inability to define benefit provisions in standard terms.

It became clear that if any general function were to be developed it would have to be by the three serious injury types separately—deaths, permanent total disabilities, and major permanent partials—and that catastrophes would have to be treated separately. A further conclusion appeared: Excess ratios are, after all, functions of loss distributions by size, and if loss distributions reveal a general pattern, state by state, and that general pattern can be expressed in terms of a parameter such as state average costs, state excess ratios would follow.

Pursuing this idea, the data which we had already tabulated for several states were adjusted, if necessary, not to the *latest* benefit provisions, but to the benefit provisions most common to the experience period. In Illinois, for example, we used claims incurred under 1944 through 1947 policies, and selected the July 17, 1945 benefits as the most common level. Claims incurred prior to that date were adjusted upward, those incurred subsequent and up to July 18, 1947 (the next benefit change) were used at actual cost, and those incurred subsequent to July 18, 1947 were adjusted downward. In this way a minimum of adjustments were required and the distorting effects of other increasing, or decreasing, loss factors, such as increasing medical costs, were minimized. In short, our objective was to get a distribution of experience as homogenous as possible, with respect to loss levels, the values of this distribution to be placed in terms of the average cost of all of those same cases on the common level.

Arrangement of the data in this fashion for the several states indicated the general pattern which had been hoped for, and which would allow proceeding to the details of combining the state experiences to form a general, large volume, multi-state curve, as presented in Tables III, V and VI.

DISTRIBUTION OF DEATH CLAIMS

The eight states' experiences forming the basis of Table III were incurred under benefit provisions having a maximum limit, either monetary or durational, upon total death indemnities. The loss distributions for these states would be expected to have peaks about the points representing the benefit maxima, and this was revealed. The New York benefits are not limited arbitrarily, and the New York experience showed a much smoother distribution—an essentially different type of curve. New York was the only un-limited benefit state for which the loss tabulation was available at the time, and it was assumed that the New York curve would be representative of such other state distributions, such as District of Columbia, which law was amended in 1948 to remove their $7,500 limit. Therefore, it was decided to show the New York values (Table IV) separately, for use in such states.

In the process of obtaining Table III, each state's data were arranged by the same intervals of Column (1), of Table III, the intent being to combine the frequencies according to the sizes expressed as ratios to the individual state averages.

Before proceeding to this combination, however, it was noted that the frequency peaks, due to maximum benefit limits, did not coincide. For example, the Alabama peak occurred at a value 165% of the average death value, and the Georgia peak occurred at 145% of the average. The coincidence, therefore, was not ideal. It appeared that the average value of all cases, both large and small, was not a perfect denominator, and was being influenced by the incidence and value of cases below retention points and in which we could have no direct interest in a study of excess ratios. Inasmuch as our final use of Table III contemplated the use of the full state average value, all cases, we could not hope to entirely eliminate this difficulty, but we could at least improve the coincidence of the upper portions of each curve before combining. This seemed worth-while, since the distributions of the higher-cost cases would be directly responsible for final excess ratios.

By examination of each state distribution, it was found that consideration of only those cases costing 90% or more of the average would include all cases with any possibility of excess over $10,000. By re-arranging the data in terms of the average of cases costing 90% or more of the original all-case average, the origin of the upper part of each state curve was shifted before combination, and the following calculation demonstrates this procedure for the Illinois data:

ILLINOIS

Death Cases Costing 90% or More of Illinois Average Cost of $3,967 And Adjustment to Terms of Average Cost of $5,355

(1) *Size, Ratio to $3,967 Average*	(2) *Claim Frequency*	(3) *Percentage Cost* (1) × (2)	(4) *Size, Ratio to $5,355 Average** (1) ÷ 1.35	(5) *Accum. Freq.* ΣCol. (2)	(6) *Std. Size Ratio*	(7) *Accum. Freq. at Size of* (6)
90%	21	1890	67%	21		
100	24	2400	74	45	70%	31
110	17	1870	81	62	80	60
120	201	24120	89	263		
130	121	15730	96	384	90	280
140	72	10080	104	456	100	420
150	91	13650	111	547	110	534
160	18	2880	119	565		
170	57	9690	126	622	120	573
180	11	1980	133	633	130	628
190	7	1330	141	640	140	639
200	4	800	148	644		
210	2	420	156	646	150	645
220	3	660	163	649	160	648
230	1	230	170	650	170	650
	650	87730				

* 877.30 ÷ 650 × $3,967 = 1.35 × $3,967 = $5,355

In explanation of the above: Columns (1) and (2) represent the upper portion of the original Illinois distribution of all death cases, for which the average value was $3,967.

Column (3) is an expression of cost, the total of which, 87730, divided by the 650 claims, indicates the average cost to be 135% of the 100% average of $3,967, and thus the average of the higher cost cases shown above is 1.35 × $3,967, or $5,355.

Column (4) shows the size groups as percentages of the new denominator of $5,355.

Columns (6) and (7) are for the purpose of standardizing the Illinois values for combination with other state data. Column (6) are merely the 10% size intervals of the final table, Column (7) being interpolated values (straight line) from Columns (4) and (5).

This procedure was followed in each state and the values of Columns (7) for each state were added directly, producing a distribution of higher cost death cases, based upon eight states and 2,327 cases. As this distribution was in terms of the higher average, however, and as it was to be used in terms of all-case averages, it was necessary to transform the size intervals from percentages of higher-case averages to percentages of all-case averages. This was done by a factor of 1.39, the ratio of the all-state higher-case average to the all-case average.

It is probable that this transformation introduces an error which could be avoided if we knew, in each state for which we would use Table III, the probable average cost of death claims in excess of 90% of the average cost of all death cases, or what amounts to the same thing, indicated ratios of these two averages, by state, such as the 1.35 shown above for Illinois.

To complete the curve, the lower-cost portions of the state distributions, in terms of ratios to all-case averages, were combined without adjustment, and only slight smoothing (by inspection) was necessary to obtain the values presented in Table III.

Table V for permanent total disability cases, and Table VI for major permanent partials, are self-explanatory in view of the above discussions of Table III for death cases. The state disability distributions, from which Tables V and VI were compiled, did not exhibit the peaks which were observed in the death distributions about the maximum death limits, and combination of the individual state values was performed without shifting origins of the upper portions of these curves. The Table VI, for major permanent partials, was based upon data for only the three states, Massachusetts, New York and Wisconsin, the only data available to us at the time, but each of these state distributions showed such a basic similarity as to allow the conclusion that any one, or the combination, would be sufficient for our purpose.

Tabulations of less serious claims, minor permanent partials and temporary totals, were not available, but it is probable that losses in excess of $10,000 in those cases, in any state, would have no appreciable influence upon average excess ratios.

APPROXIMATE "TEST" OF DEATH EXCESS RATIOS

It is difficult to imagine how any prediction of a reasonable and proper excess loss premium charge for a particular risk, or even for all risks of any one

state as a whole, could be thoroughly tested from a broad insurance viewpoint. However, since we have used basic indications of several states' data in combined form, such that we cannot say that the death distribution of Table III, for example, is exactly right for any one state, a reasonable question can be anticipated: How do the excess ratios obtained from the combined distributions compare to those we would obtain using the individual state distributions separately?

As at least a partial answer to this question, the following table shows the comparison for death cases—the group having the greatest influence upon these ratios:

	Death Excess Ratios				
State	*(1) From Table III*	*(2) From State Distribution (Approx.)*	*(3) Indicated Error (Approx.) (1) — (2)*	*(4) Ratio, Death To Total Losses*	*(5) Over-All Error, In Premiums (3)×(4)×Perm. (Approx.)*
Ala.	.007	.01	—	.14	—
Ga.	.006	—	+.01	.12	—
Ill.	.011	—	+.01	.06	—
Mass.	.275*	.20	+.08	.07	+.003
Mich.	.113	.08	+.03	.11	+.002
Mo.	.058	.11	−.05	.11	−.003
N. M.	.009	.01	−	.11	—
Wis.	.080	.01	+.07	.07	+.003

*From Table IV, Massachusetts now providing life benefits.

Column (3) shows differences in *death* excess ratios which at first glance seem rather large, particularly as possible errors relative to some correct ratio which might be assumed to be in the neighborhood of Columns (1) or (2). Column (6), however, demonstrates the relative importance of these "errors" from an over-all premium viewpoint.

Although these differences appear small, there is a possible justification in each of the above four states where the differences are notable. Massachusetts amended its law subsequent to the experience period to provide unlimited benefits to a widow, and the future distribution of Massachusetts claims can be expected to be quite different, with greater excess indications. Column (2), therefore, could be expected to be too low for the future. Michigan has also amended its law closer to an unlimited basis, as in Massachusetts.

In Missouri the reverse, a minus error indicating we may be too low, is shown. Missouri recently amended its law such that many claims previously settled under employers' liability will be compensation claims, and the distribution of Missouri death claims can be expected to change considerably. Wisconsin also has seen amendments, and the average value has increased from $6,180 on the 1945 law level to $7,140 on the latest law level.

Also, credibility of the state experiences must be considered, the 1% ratio in Column (2) for Wisconsin, for example, having been based on 301 claims, only 12 of which would have indicated excess on the present level of Wisconsin benefits. Those 12 claims might easily have been a substantially

different number because of different medical aspects only, regardless of other possible influences.

CONCLUSION

No matter how carefully we calculate average excess loss insurance charges, it is obvious that considerable underwriting judgment must be involved in deciding how appropriate such charges might be for particular risks. For example, the 9.3% District of Columbia charge for a $10,000 limitation might seem reasonably high for ordinary risks, but possibly inadequate for a hazardous risk where perhaps 50% of all losses are incurred under death claims. Although the risk standard premium will reflect such hazard, and the 9.3% will produce consequently greater volume of expected excess losses, reference to Table II will show the 9.3% factor was based upon an 18% proportion of death losses, not 50%, and is probably inadequate for such a risk.

Consideration of risk characteristics such as these reveals room for development of the method described herein, not so much from a retrospective rating point of view, but more for the purpose of contributing to solutions of excess rating problems in general, in other lines as well as compensation. Given any adequate generalized distribution of losses by size, it can be seen that logical variations in excess values, for any retention, can be obtained readily through variations in easily determined factors, varied average values, varied proportions of serious losses, varied catastrophe elements, such that we can proceed to more satisfactory solutions of our perennial excess rating problems.

TABLE I
EXCESS LOSS RATIOS AS FACTORS APPLICABLE TO STANDARD PREMIUMS

State	*Factors, Limitations of* $10,000	$15,000	$25,000	*State*	*Factors, Limitations of* $10,000	$15,000	$25,000
Alabama	.006	.005	.002	Minnesota	.015	.007	.003
Arkansas	.019	.006	.002	Mississippi	.019	.007	.002
California	.031	.016	.008	Missouri	.019	.010	.004
Colorado	.020	.013	.005	Montana	.018	.006	.003
Connecticut	.023	.012	.005	Nebraska	.037	.022	.010
Dist. of Col.	.093	.054	.021	New Hampshire	.008	.005	.002
Florida	.011	.005	.002	New Jersey	.024	.011	.005
Georgia	.006	.005	.002	New Mexico	.029	.014	.005
Hawaii	.025	.013	.006	New York	.061	.033	.009
Illinois	.012	.007	.003	No. Carolina	.013	.007	.003
Indiana	.013	.006	.003	Oklahoma	.011	.005	.002
Iowa	.007	.005	.002	Rhode Island	.020	.010	.005
Kansas	.006	.005	.002	So. Carolina	.007	.005	.002
Kentucky	.014	.006	.002	So. Dakota	.010	.005	.002
Louisiana	.013	.006	.003	Tennessee	.007	.005	.002
Maine	.011	.006	.003	Texas	.012	.005	.002
Maryland	.009	.005	.002	Vermont	.006	.005	.002
Massachusetts	.068	.035	.012	Virginia	.007	.005	.002
Michigan	.025	.009	.003	Wisconsin	.042	.023	.010

Note: Above factors include flat catastrophe elements of .005 for $10,000, .004 for $15,000 and .002 for $25,000.

TABLE II

CALCULATION OF EXCESS LOSS PREMIUM FACTORS FOR $10,000 LIMITATION PER ACCIDENT

State	(1) Death Aver. Value	(2) 10,000 ÷ (1)	(3) Death Excess Ratio	(4) P.T. Aver. Value	(5) 10,000 ÷ (4)	(6) P.T. Excess Ratio	(7) Major Aver. Value	(8) 10,000 ÷ (7)	(9) Major Excess Ratio	(10) Ratios To Total Losses: Death	P.T.	Major	(13) Over-All Excess Ratio	(14) Std. Permiss. Loss Ratio	(15) Premium Ratios With 10% Catast. Loading (13)×(14)×1.10
Alabama	4,801	233%	.007	7,251	138%	.105	2,838	352%	—	.14	.01	.11	.002	.588	.001
Arkansas	6,341	158	.043	8,637	116	.152	5,740	174	.062	.13	.02	.21	.022	.560	.014
California	6,294	159	.043	31,073	32	.685	5,729	175	.061	.07	.03	.27	.040	.597	.026
Colorado	4,900	204	.009	19,797	51	.510	3,875	258	.009	.11	.04	.15	.023	.585	.015
Connecticut	7,026	142	.075	22,249	45	.565	5,119	195	.040	.05	.03	.18	.028	.600	.018
Dist. of Col.	17,827	58*	.490	32,521	31	.695	6,270	160	.083	.18	.04	.18	.133	.610	.089
Florida	5,221	192	.013	9,261	108	.175	4,515	221	.024	.11	.02	.17	.009	.560	.006
Georgia	4,176	239	.006	6,548	153	.080	3,106	322	—	.12	.01	.14	.002	.594	.001
Hawaii	6,457	155	.050	30,358	33	.675	5,822	172	.065	.08	.02	.19	.030	.595	.020
Illinois	5,011	200	.011	14,386	70	.370	4,181	239	.015	.06	.02	.16	.010	.600	.007
Indiana	6,676	150	.058	10,567	95	.225	4,046	247	.012	.10	.02	.18	.012	.600	.008
Iowa	5,112	196	.012	5,061	198	.044	3,728	268	.007	.12	.01	.11	.003	.600	.002
Kansas	3,838	261	.005	6,499	154	.077	3,097	323	—	.10	.02	.18	.002	.570	.001
Kentucky	6,435	155	.050	9,520	105	.185	4,177	239	.015	.13	.02	.22	.014	.593	.009
Louisiana	4,756	210	.009	9,393	106	.180	4,213	237	.017	.09	.04	.18	.011	.620	.008
Maine	3,700	270	.004	11,848	84	.280	4,313	232	.019	.07	.02	.15	.009	.600	.006
Maryland	5,842	171	.025	8,825	113	.160	4,098	244	.013	.08	.01	.20	.006	.600	.004
Massachusetts	10,933	91*	.275	31,084	32	.685	8,780	114	.170	.07	.04	.28	.095	.605	.063
Michigan	7,847	127	.113	12,347	81	.295	5,394	185	.050	.11	.04	.15	.032	.575	.020
Minnesota	6,305	159	.043	20,625	48	.540	4,907	204	.036	.08	.01	.17	.015	.610	.010
Mississippi	(Arkansas values used)													.590	.014
Missouri	6,680	150	.058	17,627	57	.465	3,626	276	.005	.11	.03	.17	.021	.590	.014
Montana	7,608	131	.105	10,814	93	.235	4,705	212	.031	.09	.02	.20	.020	.600	.013
Nebraska	5,540	181	.018	22,450	44	.575	4,995	200	.038	.11	.07	.16	.048	.600	.032
New Hampshire	5,150	194	.013	6,328	158	.075	4,125	242	.014	.05	.01	.18	.004	.575	.003
New Jersey	8,122	123	.135	27,603	36	.650	4,743	211	.031	.06	.02	.23	.028	.608	.019
New Mexico	4,729	211	.009	16,110	62	.425	5,309	188	.045	.11	.06	.22	.036	.600	.024
New York	15,346	65*	.440	21,379	47	.550	8,042	124	.145	.11	.03	.18	.091	.562	.056
No. Carolina	5,278	189	.014	12,316	81	.300	3,565	281	.004	.13	.03	.18	.012	.590	.008
Oklahoma	6,948	144	.080	9,342	107	.180	3,897	257	.010	.07	.01	.25	.010	.590	.006
Rhode Island	7,036	142	.075	19,187	52	.510	4,826	207	.034	.03	.03	.20	.024	.580	.015
So. Carolina	5,181	193	.013	6,061	165	.065	3,448	290	.002	.10	.01	.28	.003	.575	.002
So. Dakota	5,591	179	.018	—	—	—	4,948	202	.037	.23	—	.10	.008	.570	.005
Tennessee	5,548	180	.018	7,617	131	.120	3,647	274	.005	.13	.01	.19	.004	.565	.002
Texas	6,440	155	.050	9,165	109	.170	3,617	276	.005	.15	.01	.20	.010	.608	.007
Vermont	3,577	280	.004	5,301	189	.048	2,969	337	—	.09	.02	.14	.001	.600	.001
Virginia	4,094	244	.006	10,582	95	.225	3,144	318	—	.11	.01	.14	.003	.595	.002
Wisconsin	7,140	140	.080	35,109	28	.725	8,779	114	.170	.07	.03	.18	.058	.579	.037

*Entry to Table IV, unlimited death benefits.

TABLE III—DEATH CASES*

(1)	(2)	(3)	(4)
Ratio to Average (Mid Point)	*% of Total Cases, Cases at or Above Column (1)*	*% of Total Costs, Cases at or Above Column (1)*	*% of Losses in Excess of Col. (1) Per Case (3) — (2) × (1) ÷ 100*
0%	100.0%	100.00%	100.0%
10	98.4	99.96	90.1
20	93.7	99.49	80.8
30	85.8	97.91	72.2
40	81.2	96.53	64.1
50	76.6	94.69	56.4
60	72.4	92.59	49.2
70	68.0	89.95	42.4
80	64.3	87.36	35.9
90	60.3	84.16	29.9
100	55.0	79.39	24.4
110	50.5	74.89	19.3
120	45.0	68.84	14.8
130	38.0	60.44	11.0
140	30.0	50.04	8.0
150	21.9	38.60	5.8
160	14.3	27.20	4.3
170	9.3	18.20	2.4
180	6.1	12.76	1.8
190	4.0	8.98	1.4
200	2.8	6.70	1.1
210	2.0	5.10	0.9
220	1.3	3.63	0.8
230	1.0	2.97	0.7
240	0.8	2.51	0.6
250	0.7	2.27	0.5
260	0.6	2.02	0.5
270	0.5	1.76	0.4
280	0.4	1.49	0.4
290	0.3	1.21	0.3
300 & Over	0.2	.92	0.3

*Based on experiences of Alabama, Georgia, Illinois, Massachusetts, Michigan, Missouri, New Mexico, Wisconsin.

TABLE IV—DEATH CASES* N. Y.

(1) *Ratio to Average (Mid Point)*	(2) *% of Total Cases, Cases at or Above Column (1)*	(3) *% of Total Costs, Cases at or Above Column (1)*	(4) *% of Losses in Excess of Col. (1) Per Case (3) — (2) × (1) ÷ 100*
0%	100.0%	100.00%	100.0%
10	99.9	100.00	90.0
20	99.6	99.97	80.1
30	98.7	99.79	70.2
40	80.0	94.18	62.2
50	76.0	92.58	54.6
60	72.5	90.83	47.3
70	68.5	88.43	40.5
80	64.0	85.28	34.1
90	58.5	80.88	28.2
100	52.0	75.03	23.0
110	44.2	67.23	18.6
120	36.7	58.98	14.9
130	29.7	50.58	12.0
140	23.4	42.39	9.6
150	17.9	34.69	7.8
160	13.8	28.54	6.5
170	9.8	22.14	5.5
180	7.2	17.72	4.8
190	5.7	15.02	4.2
200	4.5	12.74	3.7
210	3.7	11.14	3.4
220	3.0	9.67	3.1
230	2.5	8.57	2.8
240	2.0	7.42	2.6
250	1.6	6.46	2.5
260	1.2	5.46	2.4
270	0.9	4.68	2.3
280	0.6	3.87	2.2
290	0.4	3.31	2.1
300 & Over	0.2	2.73	2.1

*Based on New York experience only.

TABLE V—PERMANENT TOTAL CASES*

(1) *Ratio to Average (Mid Point)*	(2) *% of Total Cases, Cases at or Above Column (1)*	(3) *% of Total Costs, Cases at or Above Column (1)*	(4) *% of Losses in Excess of Col. (1) Per Case (3) — (2) × (1) ÷ 100*
0%	100.0%	100.00%	100.0%
10	98.7	99.87	90.0
20	96.0	99.33	80.1
30	92.3	98.22	70.5
40	87.5	96.30	61.3
50	81.0	93.05	52.6
60	73.6	88.61	44.5
70	65.0	82.59	37.1
80	55.5	74.99	30.6
90	45.5	65.99	25.0
100	36.0	56.49	20.5
110	27.5	47.14	16.9
120	23.3	42.10	14.1
130	19.3	36.90	11.8
140	15.8	32.00	9.9
150	12.5	27.05	8.3
160	9.8	22.73	7.1
170	7.5	18.82	6.1
180	5.5	15.22	5.3
190	4.3	12.94	4.8
200	3.8	11.94	4.3
210	3.0	10.29	4.0
220	2.5	9.19	3.7
230	2.1	8.27	3.4
240	1.8	7.55	3.2
250	1.5	6.80	3.1
260	1.3	6.28	2.9
270	1.1	5.74	2.8
280	0.9	5.18	2.7
290	0.8	4.89	2.6
300 & Over	0.7	4.59	2.5

*Based on Alabama, Georgia, Illinois, Massachusetts, Michigan, Missouri, New Mexico, Wisconsin.

TABLE VI—MAJOR CASES*

(1) *Ratio to Average (Mid Point)*	(2) *% of Total Cases, Cases at or Above Column (1)*	(3) *% of Total Costs, Cases at or Above Column (1)*	(4) *% of Losses in Excess of Col. (1) Per Case (3) — (2) × (1) ÷ 100*
0%	100.0%	100.00%	100.0%
10	99.4	99.94	90.0
20	98.3	99.72	80.1
30	95.6	98.88	70.2
40	87.0	95.44	60.6
50	77.8	90.84	51.9
60	67.6	84.72	44.2
70	55.3	76.11	37.4
80	47.5	69.87	31.9
90	40.5	63.57	27.1
100	35.0	57.07	22.1
110	29.7	51.24	18.6
120	24.7	45.24	15.6
130	20.2	39.39	13.1
140	16.9	34.77	11.1
150	14.7	31.47	9.4
160	12.8	28.44	8.0
170	11.2	25.72	6.7
180	9.6	22.92	5.6
190	8.3	20.45	4.7
200	7.1	18.05	3.8
210	6.2	16.16	3.2
220	5.5	14.62	2.5
230	4.8	13.01	2.0
240	4.1	11.33	1.5
250	3.4	9.62	1.1
260	2.7	7.92	0.9
270	2.3	6.84	0.6
280	1.9	5.72	0.4
290	1.5	4.56	0.2
300 & Over	1.2	3.66	0.1

*Based on Data from Massachusetts, New York and Wisconsin.