BLENDED MORTALITY TABLES—LIFE INSURANCE
AND ANNUITIES

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HAS THE BLEND BEEN SO BLAND AS TO BLIND US TO BLUNDERS?
RAY M. PETERSON, *TSA* XI (1959): 815.

SUMMARY

At its December 1983 meeting, the National Association of Insurance Commissioners (NAIC) adopted a set of five blended non-sex-distinct 1980 Commissioners Standard Ordinary (CSO) mortality tables for use in determining minimum nonforfeiture values, not varying by sex, for life insurance policies affected by the Supreme Court's Norris Decision. With the increasing prevalence of nonsmoker policies, there likely will be a growing need for blended 1980 CSO Smoker and Nonsmoker tables for employee benefit plans.

This paper presents blended 1980 CSO and Commissioners Extended Term (CET) Smoker and Nonsmoker mortality tables using the same methodology and pivotal age as used in the composite blended tables and for the same percentages of male to total, viz., 80, 60, 50, 40, and 20 percent. Tables are provided to illustrate the effects of blending male and female smoker and nonsmoker mortality rates. A set of identifying codes is suggested. The tables were published as an exposure draft by the NAIC in June 1986 and adopted in December 1986.

This paper also provides blended versions of the 1983 Table *a* individual annuity mortality table and the 1983 Group Annuity Mortality (GAM) table using the same methodology as for the 1980 CSO tables. The choice of a pivotal age is discussed, and age 65 is recommended as appropriate for use in employee benefit plans. Tables are provided to illustrate the effects of various pivotal ages. Illustrative annuity values are presented. The paper also explores the use of the male 1983 GAM table with a three-year age setback to approximate the 50 percent blended table. Setbacks of one and five years rather closely approximate values on the 80 and 20 percent male blended tables.

INTRODUCTION

At its December 1983 meeting, the NAIC adopted two sets of mortality tables derived from the 1980 CSO mortality tables. A set of five blended non-sex-distinct mortality tables was adopted to provide for minimum non-forfeiture values on life insurance policies issued on a non-sex-distinct basis in accordance with the Supreme Court's Norris decision for employee benefit plans.[1] Indiana and New York permit use of the blended tables for reserve valuation.

The second set of mortality tables was to be permitted as an option for both valuation and nonforfeiture values on policies issued with separate premium rates for smokers and nonsmokers.[2] The Smoker/Nonsmoker tables are sex distinct like the 1980 CSO tables from which they were derived.

There has been some interest expressed in non-sex-distinct versions of the 1980 CSO Smoker and Nonsmoker mortality tables for use with individual policies issued in connection with employee benefit plans. Growing numbers of employers are adopting programs restricting or banning smoking in the workplace, and many are promoting programs to help employees break the smoking habit. Nonsmoker pension trust or other employer-provided policies may be useful for employees of such firms. The blended tables offered in this paper are intended to meet this need. Moreover, one state, Montana, does not permit sex-distinct insurance contracts, and other states are considering similar action. Subsequent to the completion of this paper, the NAIC Life and Health Actuarial Task Force requested an advance copy and distributed excerpts. The blended Smoker and Nonsmoker tables were "exposed" at the NAIC's June 1986 meeting and adopted at the December 1986 meeting.

The blended 1980 CSO Smoker and Nonsmoker tables have been calculated by the same computer program used to calculate the composite blended tables adopted by the NAIC in 1983 and for the same five proportions of male l_x to total l_x—20, 40, 50, 60, and 80 percent—at the same pivotal age of 45.

There has been some interest also in blended versions of the recently adopted individual annuity mortality table, 1983 Table a. Individual annuities issued under a pension plan must be issued, according to the Norris

[1] "Report of the Society of Actuaries Committee on Nonforfeiture and Valuation Mortality Problems—Individual Life Insurance and Annuities," *TSA*, XXXVII (1985): 393.

[2] "Report of the (Society of Actuaries) Task Force on Smoker/Nonsmoker Mortality," *TSA, 1982 Reports* (1985): 343.

decision, on a non-sex-distinct basis, but then there is a problem of identifying the table in the contract as required, for example, by the New York Insurance Law, Section 4223(a)(1)(c). Internal Revenue Service (IRS) Revenue Ruling 79-90 also requires identification of any annuity table. In addition, non-sex-distinct annuity values are needed for settlement options in policies issued in Montana.

Identification of a blended annuity table is awkward because there is no standard or recognized method of constructing such a table. With the hope of filling this need, this paper provides blended versions of the 1983 Table a prepared in the same way as the blended 1980 CSO tables, for the same percentages of male l_x to total l_x and identified with the same suffix letters, B through F. However, the pivotal age has been changed from that used for the insurance tables.

Finally, for the sake of completeness, blended versions of the 1983 GAM table have been provided. The male table was designed to be used with an age setback for annuities on female lives and the committee report noted that six years was appropriate. This suggests the possibility of using lesser setbacks for annuities issued on a non-sex-distinct basis. The blended 1983 GAM tables therefore can be considered as providing an alternate approach to the use of the male table with a modified age setback.

In providing these blended mortality tables, the author does not intend to imply endorsement of the concept of requiring non-sex-distinct mortality tables, but merely wishes to make such tables available for use where they are required by law, regulation, or judicial decision.

BLENDED 1980 CSO SMOKER AND NONSMOKER MORTALITY TABLES

Because the blended 1980 CSO mortality tables approved by the NAIC in 1983 used age 45 as the pivotal age, no alternate age was considered for the blended Smoker and Nonsmoker tables. All of the following 1980 CSO blended Smoker and Nonsmoker mortality rates and all the comparisons are based on age 45 as the pivotal or reference age at which the ratio of male l_x to total l_x is applied.

The operation of deriving blended values of l_x at other ages for each ratio of male l_x to total l_x at the pivotal age is explained in the following excerpt from the November 28, 1983, Report of the Committee on Noforfeiture and Valuation Mortality Problems:

> At the pivotal age in each case two ratios were formed: the ratio to be applied to all the male l_x's is:
>
> $$MR = (l_x^M + l_x^F) \times Z/l_x^M.$$
>
> where Z is the chosen ratio of male l_x to total l_x;

the other, to be applied to all the female l_x's, is:

$$FR = (l_x^M + l_x^F) \times (1 - Z)/l_x^F.$$

Totals of the adjusted male and female l_x's were formed at each age and used to calculate (the blended) mortality rates.

As shown by Tables 1 through 5, the ratios of male l_x to total l_x at ages some distance above the pivotal age, are quite different for the Smoker and Nonsmoker tables as compared with each other and with the corresponding ratios for the composite 1980 CSO blended mortality tables. These differences in the ratios reflect not only differences in male and female mortality but also the fact that the ratios of smoker to nonsmoker mortality used in deriving the Basic Smoker and Nonsmoker 1980 CSO mortality rates were much lower for females than for males. To help the reader in comparing the ratios, the columns have been arranged in order of decreasing risk—Smoker, Composite, Nonsmoker.

TABLE 1

1980 CSO—Comparison of Ratios of Male l_x to Total l_x
Ratio of Male l_x to Total l_x at Pivotal Age 45 Is 80 Percent

Table Age	Smoker	Composite	Nonsmoker
25	80.26%	80.17%	80.08%
35	80.15	80.10	80.04
45	80.00	80.00	80.00
55	79.50	79.71	79.88
65	77.73	78.64	79.22
75	72.73	75.54	76.90
85	62.08	68.56	71.12
95	51.10	60.07	63.35

TABLE 2

1980 CSO—Comparison of Ratios of Male l_x to Total l_x
Ratio of Male l_x to Total l_x at Pivotal Age 45 Is 60 Percent

Table Age	Smoker	Composite	Nonsmoker
25	60.38%	60.26%	60.11%
35	60.23	60.15	60.05
45	60.00	60.00	60.00
55	59.26	59.57	59.82
65	56.68	58.00	58.85
75	50.01	53.67	55.52
85	38.04	44.99	48.01
95	28.15	36.06	39.33

TABLE 3

1980 CSO—COMPARISON OF RATIOS OF MALE l_x TO TOTAL l_x
RATIO OF MALE l_x TO TOTAL l_x AT PIVOTAL AGE 45 IS 50 PERCENT

Table Age	Smoker	Composite	Nonsmoker
25................	50.40%	50.27%	50.12%
35................	50.24	50.15	50.05
45................	50.00	50.00	50.00
55................	49.23	49.55	49.81
65................	46.59	47.93	48.80
75................	40.01	43.57	45.42
85................	29.04	35.29	38.10
95................	20.71	27.32	30.17

TABLE 4

1980 CSO—COMPARISON OF RATIOS OF MALE l_x TO TOTAL l_x
RATIO OF MALE l_x TO TOTAL l_x AT PIVOTAL AGE 45 IS 40 PERCENT

Table Age	Smoker	Composite	Nonsmoker
25................	40.39%	40.26%	40.12%
35................	40.23	40.15	40.05
45................	40.00	40.00	40.00
55................	39.26	39.57	39.82
65................	36.77	38.03	38.86
75................	30.78	33.98	35.68
85................	21.43	26.66	29.10
95................	14.83	20.05	22.36

TABLE 5

1980 CSO—COMPARISON OF RATIOS OF MALE l_x TO TOTAL l_x
RATIO OF MALE l_x TO TOTAL l_x AT PIVOTAL AGE 45 IS 20 PERCENT

Table Age	Smoker	Composite	Nonsmoker
25................	20.26%	20.17%	20.08%
35................	20.15	20.10	20.04
45................	20.00	20.00	20.00
55................	19.51	19.71	19.88
65................	17.90	18.71	19.24
75................	14.29	16.18	17.22
85................	9.28	12.00	13.34
95................	6.13	8.59	9.75

The differing effect of smoking on the survivor rates of males and females
is readily apparent. Note that at ages 65 and over the proportion of male
lives is increasingly lower for the smoker groups than for the corresponding

nonsmokers, reflecting the differences in survivor rates between male and female smokers and nonsmokers. This effect of relative smoker and non-smoker mortality rates at the very high ages will be discussed later.

At ages below age 45, there was, as expected, very little change from the age 45 ratio in any of the tables.

The more rapid fall-off in the ratio of male l_x to total l_x with increasing age among smokers as illustrated in Tables 1 through 5 helps to explain the relationships of the smoker and nonsmoker blended mortality rates. Note that (1) mortality takes a heavy toll of male smokers; (2) at ages 60 and higher female smoker mortality is lower than male nonsmoker; and (3) the Smoker and Nonsmoker tables are identical for males after age 94 and females after age 93. These facts are responsible for an apparent anomaly at the very high ages: the blended smoker mortality rates, as originally calculated, were lower than the corresponding nonsmoker rates, and the non-smoker rates were higher than the composite rates.

To remove these anomalies, the blended smoker mortality rates at the very high ages were arbitrarily adjusted to be not less than the corresponding composite blended rates, i.e., the 1980 CSO-B, C, D, E, or F rates. Similarly the nonsmoker rates were adjusted to be not more than the composite rates. Finally, the blended smoker and nonsmoker rates were adjusted to equal the respective blended composite tables after age 93, following the example of the separate male and female smoker and nonsmoker tables.

The adjusted blended Smoker and Nonsmoker CSO rates are identified in Appendixes A and B. The corresponding CET rates at the same ages also reflect these adjustments.

Tables 6 and 7 show the differences in the blended mortality rates as (1) the excess of smoker mortality rates over the corresponding nonsmoker mortality rates and (2) smoker mortality as a percent of corresponding nonsmoker

TABLE 6

SMOKER VERSUS NONSMOKER MORTALITY BY RATIO MALE l_x TO TOTAL l_x
EXCESS OF SMOKER OVER NONSMOKER MORTALITY RATE PER 1,000

Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
35............	0.94	0.86	0.75	0.71	0.66	0.57	0.47
45............	2.95	2.68	2.42	2.28	2.15	1.88	1.62
55............	7.32	6.48	5.66	5.26	4.84	4.06	3.27
65............	15.16	12.90	10.82	9.85	8.91	7.14	5.52
75............	24.97	19.80	15.97	14.43	13.09	10.92	9.32
85............	25.00	16.63	12.98	12.03	11.43	10.95	11.04

mortality. Not surprisingly, the arithmetic differences increase with age and with percent male. The ratios peak in the 45–55 age range but increase with percent male. The increase with increasing percent male reflects the fact noted earlier that the ratios of smoker to nonsmoker mortality were greater for males than for females.

TABLE 7

SMOKER VERSUS NONSMOKER MORTALITY BY RATIO MALE l_x TO TOTAL l_x
SMOKER MORTALITY AS PERCENT OF NONSMOKER MORTALITY

Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
35...........	156%	152%	147%	145%	142%	138%	132%
45...........	189	182	176	172	169	161	154
55...........	194	187	179	176	171	163	153
65...........	172	166	160	157	154	148	141
75...........	143	137	132	131	129	127	125
85...........	117	112	110	109	109	109	110

As an additional measure of differences in mortality levels, the complete expectation of life is shown in Table 8 for selected ages on the Smoker and Nonsmoker versions of the 1980 CSO mortality tables for males and females separately. Comparing the values of the expectation of life shows the greater effect of smoking on male longevity than on female longevity and provides some additional explanation of the relationships of the blended Smoker and Nonsmoker tables. The order of the columns in Table 8 was chosen to highlight the progression in longevity from smokers to composite to non-smokers.

TABLE 8

COMPARATIVE VALUES OF COMPLETE EXPECTATION OF LIFE—1980 CSO
SMOKER VERSUS COMPOSITE VERSUS NONSMOKER

AGE x	MALES			FEMALES		
	Smoker $\overset{\circ}{e}_x$	Composite $\overset{\circ}{e}_x$	Nonsmoker $\overset{\circ}{e}_x$	Smoker $\overset{\circ}{e}_x$	Composite $\overset{\circ}{e}_x$	Nonsmoker $\overset{\circ}{e}_x$
35..........	35.38	38.61	40.35	40.79	42.98	43.65
45..........	26.57	29.62	31.15	31.85	33.88	34.45
55..........	18.68	21.29	22.44	23.62	25.31	25.68
65..........	12.13	14.04	14.70	16.09	17.32	17.49
75..........	7.26	8.31	8.58	9.63	10.32	10.38
85..........	4.16	4.46	4.51	4.99	5.18	5.19

Table 9 shows values of $1,000q_x$ for selected ages 35 through 85 and for each of the five ratios of male l_x to total l_x as well as 100 percent male and 100 percent female. Unadjusted values of $1,000 q_x$ are shown at age 95 for both smokers and nonsmokers.

TABLE 9

SUMMARY COMPARISON OF BLENDED MORTALITY RATES

AGE	PERCENT OF MALE l_x TO TOTAL l_x						
x	100%	80%	60%	50%	40%	20%	0%
	Smoker Mortality Rates per 1,000						
35	2.63	2.50	2.35	2.29	2.22	2.08	1.94
45	6.27	5.94	5.61	5.44	5.28	4.94	4.61
55	15.14	13.96	12.80	12.23	11.65	10.52	9.40
65	36.29	32.45	28.83	27.09	25.40	22.15	19.07
75	83.77	73.64	65.21	61.49	58.07	51.94	46.64
85	174.20	156.08	144.59	140.30	136.67	130.86	126.42
	Unadjusted*						
95	329.96	323.65	320.89	319.92	319.22	317.98	317.32
	Composite Mortality Rates per 1,000						
35	2.11	2.02	1.93	1.88	1.83	1.74	1.65
45	4.55	4.35	4.15	4.06	3.96	3.75	3.56
55	10.47	9.78	9.11	8.77	8.43	7.76	7.09
65	25.42	23.11	20.88	19.78	18.71	16.62	14.59
75	64.19	57.84	52.16	49.55	47.05	42.43	38.24
85	152.95	141.38	132.68	129.11	125.93	120.52	116.10
95	329.96	324.89	322.03	320.74	319.76	318.37	317.32
	Nonsmoker Mortality Rates per 1,000						
35	1.69	1.64	1.60	1.58	1.56	1.51	1.47
45	3.32	3.26	3.19	3.16	3.13	3.06	2.99
55	7.82	7.48	7.14	6.97	6.81	6.46	6.13
65	21.13	19.55	18.01	17.24	16.49	15.01	13.55
75	58.80	53.84	49.24	47.06	44.98	41.02	37.32
85	149.20	139.45	131.61	128.27	125.24	119.91	115.38
	Unadjusted*						
95	329.96	325.17	322.27	321.00	320.07	318.52	317.32

* Adjusted age 95 rates are equal to the composite rates.

The actuary working with blended smoker and nonsmoker rates should pay careful attention to the possibility of a lower proportion of females among smokers than among nonsmokers and make appropriate adjustments. The comparisons in Tables 6 through 9 also point up the need to develop effective underwriting procedures to screen the smokers.

Table 10 illustrates at specimen ages whole life premiums per $1,000 at 4.5 percent interest for each of the five blended Smoker and Nonsmoker tables. Premiums on the 100 percent male and 100 percent female Smoker and Nonsmoker tables are also shown for comparison. Traditional functions were used in order to be comparable with the values in the Smoker/Nonsmoker Report. The combined effect of smoking and male mortality on the gradation of premiums by percent male is well illustrated in Table 10 and is reinforced by Table 11.

TABLE 10

SUMMARY COMPARISON OF BLENDED PREMIUM RATES
WHOLE LIFE NET LEVEL PREMIUMS PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25...........	8.81	8.41	8.02	7.82	7.62	7.23	6.85
35...........	13.81	13.14	12.49	12.16	11.85	11.22	10.60
45...........	22.60	21.34	20.13	19.54	18.96	17.84	16.75
55...........	37.93	35.37	33.00	31.87	30.79	28.73	26.81
65...........	65.40	60.19	55.71	53.69	51.81	48.39	45.36
75...........	115.49	105.43	97.97	94.92	92.22	87.64	83.93
	Nonsmoker						
25...........	6.73	6.54	6.35	6.26	6.17	5.98	5.80
35...........	10.40	10.10	9.80	9.65	9.50	9.20	8.91
45...........	16.86	16.29	15.73	15.46	15.18	14.65	14.12
55...........	28.55	27.37	26.23	25.68	25.14	24.08	23.05
65...........	50.91	48.44	46.13	45.03	43.98	41.96	40.08
75...........	95.75	90.80	86.51	84.58	82.78	79.49	76.58

TABLE 11

EXCESS OF 80%, 50%, AND 20% MALE PREMIUMS
OVER CORRESPONDING 0% MALE PREMIUMS

Issue Age	25	35	45	55	65
	Excess over 0% Male Premiums—Smoker				
80% Male.........	1.56	2.54	4.59	8.56	14.83
50% Male.........	0.97	1.56	2.79	5.06	8.33
20% Male.........	0.38	0.62	1.09	1.92	3.03
	Excess over 0% Male Premiums—Nonsmoker				
80% Male.........	0.74	1.19	2.17	4.32	8.36
50% Male.........	0.46	0.74	1.34	2.63	4.95
20% Male.........	0.18	0.29	0.53	1.03	1.88

Table 10 also indicates that female smokers would be severely penalized if their non-sex-distinct premiums were based on these tables, particularly at the moderately high ages where female smoker mortality is lower even than male nonsmokers. At the high ages, as noted earlier (cf. Tables 1–5), survivorship greatly favors female smokers over male smokers.

Table 11 compares 80, 50, and 20 percent male premiums with 0 percent male (100 percent female) premiums. Note the substantial excess premiums for smokers over nonsmokers, further substantiating the severe penalty that unisex imposes on female smokers.

It is important to keep in mind, however, that these Smoker and Non-smoker blended tables are intended for use with employee benefit plans. Issue of nonsmoker policies would likely depend on the employer's attitude toward smoking in the workplace and on the employer's actively promoting no smoking off the premises. While such a group could be issued nonsmoker policies, groups not meeting these criteria would likely be issued composite policies, since the groups would include both smokers and nonsmokers. Consequently, we would not expect issue of blended smoker policies in practice unless smoking were recognized on an individual basis in employee benefit plans or a company wished to offer smoker and nonsmoker rates on unisex individual policies.

Tables 12 and 13 compare tenth-year and twentieth-year net level terminal reserves (traditional basis) at 4.5 percent interest. The decrease in reserves with decreasing percent male is substantial at the younger ages, but lessens with advancing age until at issue age 75 for tenth-year reserves and age 65 for twentieth-year reserves, the reserves increase with decreasing percent male. Smoker reserves are higher than nonsmoker reserves for 10-year values at age 55 and under and for 20-year values at age 45 and under.

While the tenth and twentieth year 100 percent male smoker reserves at ages 25, 45, and 65 agree exactly with the corresponding reserves in the Task Force Report's table in *TSA 1982 Reports*, page 390, there are small differences in the nonsmoker reserves. These differences are due to the male

TABLE 12

SUMMARY COMPARISON OF BLENDED NET-LEVEL TENTH-YEAR RESERVES
WHOLE LIFE TENTH-YEAR RESERVES PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25..........	87.79	84.12	80.48	78.71	76.91	73.41	69.97
35..........	134.00	127.38	120.99	117.84	114.74	108.71	102.82
45..........	189.23	178.84	169.16	164.57	160.14	151.74	143.93
55..........	253.29	240.39	229.93	225.50	221.56	214.94	209.85
65..........	315.88	304.63	299.64	298.77	298.70	300.34	303.67
75..........	347.58	352.38	362.85	368.55	374.22	385.01	394.81
	Nonsmoker						
25..........	68.70	66.90	65.15	64.28	63.41	61.67	59.94
35..........	107.79	104.36	100.96	99.28	97.58	94.28	91.02
45..........	163.25	157.33	151.58	148.73	145.96	140.49	135.15
55..........	237.98	230.22	223.04	219.67	216.44	210.36	204.75
65..........	323.02	316.46	311.66	309.83	308.34	306.22	305.08
75..........	389.53	390.81	394.40	396.75	399.30	404.83	410.57

TABLE 13

SUMMARY COMPARISON OF BLENDED NET-LEVEL TWENTIETH-YEAR RESERVES
WHOLE LIFE TWENTIETH-YEAR RESERVES PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25...........	210.03	200.78	191.73	187.28	182.83	174.14	165.60
35...........	297.87	283.44	269.68	263.02	256.51	243.96	231.96
45...........	394.59	376.24	360.19	352.96	346.22	334.06	323.58
55...........	489.16	471.79	460.67	456.90	454.07	450.72	449.79
65...........	553.67	549.66	553.77	557.21	561.14	569.71	578.58
75...........	640.39	661.04	676.88	683.41	689.25	699.21	707.40
	Nonsmoker						
25...........	169.08	164.28	159.54	157.18	154.81	150.13	145.50
35...........	253.44	245.27	237.23	233.25	229.30	221.53	213.87
45...........	362.38	351.33	340.81	335.73	330.81	321.30	312.23
55...........	484.13	473.83	465.19	461.44	458.04	452.16	447.37
65...........	586.73	583.60	583.14	583.65	584.52	587.08	590.39
75...........	685.15	694.44	703.12	707.13	710.93	717.97	724.33

nonsmoker rates in Appendix F of the report (the rates adopted by the NAIC) differing slightly at age 71 from the value developed in Appendix E of the Task Force Report (38.91 versus 38.31).

In considering whether blended tables should be used for reserves instead of separate male and female tables, it should be kept in mind that the use of separate male and female Smoker and Nonsmoker tables for reserves makes such reserves independent of any assumed proportion of males and females at issue or any subsequent changes in the proportions after issue.

Since the blended Smoker and Nonsmoker tables, like the blended composite 1980 CSO tables, are intended primarily for defining minimum nonforfeiture values, Tables 14 through 17 compare minimum cash values and corresponding amounts of reduced paid-up insurance for the five blends and for the 100 percent male and 100 percent female tables, for smokers and for nonsmokers.

Tables 14 and 15 display, at representative ages, tenth-year and twentieth-year minimum cash values for $1,000 whole life insurance at 4.5 percent interest for each of the blended Smoker and Nonsmoker mortality tables. The cash values have been rounded up to the next higher dollar.

At ages below 55, the tenth-year smoker cash values are larger than the corresponding nonsmoker values; at ages 65 and over, they are smaller. At age 55, the two sets of values are very close, for all percentage blends. The twentieth-year cash values show much the same pattern.

TABLE 14

SUMMARY COMPARISON OF TENTH-YEAR CASH VALUES
WHOLE LIFE TENTH-YEAR CASH VALUES PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25	69	66	63	61	59	56	53
35	111	105	99	96	93	88	82
45	159	149	140	136	132	125	118
55	211	200	191	187	184	179	176
65	275	263	258	257	257	259	262
75	309	314	325	331	337	349	359
	Nonsmoker						
25	52	50	49	48	47	46	44
35	88	85	81	80	78	75	72
45	138	132	127	124	122	117	112
55	204	197	190	187	184	179	174
65	283	276	271	269	267	265	264
75	353	355	359	361	364	370	376

TABLE 15

SUMMARY COMPARISON OF TWENTIETH-YEAR CASH VALUES
WHOLE LIFE TWENTIETH-YEAR CASH VALUES PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25	194	185	176	172	167	159	151
35	279	265	251	245	239	226	215
45	372	354	338	331	325	313	303
55	460	444	434	430	428	426	426
65	527	523	527	531	535	544	554
75	619	641	658	665	671	682	690
	Nonsmoker						
25	154	150	145	143	140	136	131
35	237	229	221	217	213	205	198
45	343	332	322	317	312	303	294
55	461	451	443	439	436	431	426
65	562	559	559	559	560	563	566
75	667	677	686	690	694	702	708

Generally the cash values decrease as the male percentage decreases except for smokers at age 65 where tenth- and twentieth-year cash values dip and then increase with decreasing percent male. Nonsmoker cash values also exhibit a dip at age 65 but only for the twentieth-year values. At age 75, all cash values increased with decreasing percent male.

TABLE 16

SUMMARY COMPARISON OF TENTH-YEAR REDUCED PAID-UP INSURANCE
WHOLE LIFE TENTH-YEAR PAID-UP INSURANCE PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25.......	285	283	281	277	274	271	269
35.......	323	317	311	308	305	301	293
45.......	340	331	323	320	317	313	308
55.......	350	344	339	337	337	339	344
65.......	378	371	372	374	378	387	397
75.......	376	387	404	413	421	438	452
	Nonsmoker						
25.......	268	264	265	263	261	262	257
35.......	313	310	303	303	300	296	292
45.......	347	340	336	332	331	327	322
55.......	377	373	368	366	365	363	361
65.......	411	407	406	406	406	409	413
75.......	436	442	450	454	459	468	478

TABLE 17

SUMMARY COMPARISON OF TWENTIETH-YEAR REDUCED PAID-UP INSURANCE
WHOLE LIFE-TWENTIETH-YEAR PAID-UP INSURANCE PER $1,000 AT 4.5% INTEREST

Issue Age	Percent of Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Smoker						
25.......	564	559	553	552	547	543	540
35.......	596	588	579	576	574	565	561
45.......	617	608	600	597	596	592	591
55.......	632	626	625	626	628	636	645
65.......	641	644	655	662	669	683	698
75.......	686	711	731	738	745	758	767
	Nonsmoker						
25.......	548	547	542	542	538	536	531
35.......	595	590	584	581	578	572	568
45.......	634	628	623	621	618	614	610
55.......	669	665	664	663	663	665	666
65.......	694	696	700	702	705	712	719
75.......	740	751	762	766	771	780	786

Tables 16 and 17 present amounts of reduced paid-up insurance purchased by the cash values shown in Tables 14 and 15 for $1,000 whole life insurance. The amounts of paid-up insurance have been rounded up to the next higher dollar.

Patterns similar to those for cash values were found for the amounts of reduced paid-up insurance except that the excess of smoker over nonsmoker

stops at a younger age than for the cash values and the age 65 dip is found in the tenth-year but not the twentieth-year. A slight dip occurs at age 55 for the twentieth-year values for both the Smoker and Nonsmoker tables.

Tables of $1,000q_x$ and l_x (both CSO and CET versions) for smokers appear in Appendix A and for nonsmokers in Appendix B. The CET rates were obtained by applying the 1980 CET loading formula to the blended 1980 CSO Smoker and Nonsmoker mortality rates. This is the approach used by the respective committees in deriving the blended composite 1980 CET mortality tables and the sex-distinct 1980 CET Smoker and Nonsmoker mortality tables. All mortality rates are age nearest birthday. Age last birthday mortality rates can be derived from these age nearest birthday rates using the method described in *TSA* XXXIII, 1981, page 671.

Values are shown for each ratio of male l_x to total l_x—80, 60, 50, 40, and 20 percent. The tables are identified by the codes, SB, SC, SD, SE, and SF for the Smoker tables and by the codes, NB, NC, ND, NE, and NF for the Nonsmoker tables. The letters B, C, D, E, and F correspond to the code letters which identify the blended tables adopted by the NAIC in December 1983. In its model regulation, the NAIC referred to the 100 percent male and female tables as the 1980 CSO-A and 1980 CSO-G tables. This suggests that the 100 percent male Smoker and Nonsmoker tables can be identified as 1980 CSO-SA and 1980 CSO-NA, and the 100 percent female Smoker and Nonsmoker tables as 1980 CSO-SG and 1980 CSO-NG, respectively.

BLENDED INDIVIDUAL ANNUITY MORTALITY TABLES

A perceived need for blended non-sex-distinct individual annuity mortality tables is based on several factors. Life insurance policies issued in connection with employee benefit plans require settlement options which must themselves be based on non-sex-distinct annuity mortality tables. Individual annuities issued as part of a pension plan must also be on a non-sex-distinct basis. As briefly mentioned in the introduction, there are regulatory requirements which are most easily met by having available specific, recognized mortality tables.

The model standard nonforfeiture law adopted by the NAIC in 1977 requires in Section 3 that an annuity contract provide for "(c) A statement of the mortality table, if any, and interest rate used in calculating any minimum paid-up annuity, cash surrender or death benefits that are guaranteed under the contract, together with sufficient information to determine the amounts of such benefits."

IRS Revenue Ruling 79-90, I.R.B. 1979-11, 8 states with respect to defined benefit plans: "Actuarial equivalents: Computation—A defined benefit plan which provides optional forms of retirement benefits which are, according to the provisions of the plan, 'actuarially equivalent' to the normal benefit must specify the actuarial assumptions used to compute the amounts of such optional benefits." The purpose of the revenue ruling is to preclude the exercise of employer discretion which includes the discretion of the employer, plan administrator, fiduciary, actuary, and so on.

· The text of the ruling goes on to describe two acceptable fixed standards which satisfy this requirement, viz., (1) specifying the actuarial assumptions (interest, mortality, and so on) to be used, or (2) including a table of adjustment factors to be used.

The blended versions of the 1983 Table a[3] individual annuity mortality tables provided in this paper are intended as identifiable tables for use as required by state insurance laws or regulations or by the IRS or in other instances where a blended individual annuity table is needed.

In deriving blended individual annuity mortality tables, it is necessary to establish an appropriate pivotal age at which the desired ratio of male l_x to total l_x will be applied. In the November 28, 1983, Report of the Committee on Nonforfeiture and Valuation Mortality Problems "Individual Life Insurance and Annuities,"[4] age 45 was selected for the blended 1980 CSO tables on the basis of (1) the age distribution of pension life insurance and (2) the relative effects of the choice of a pivotal age on mortality rates at the low and high ages.

Considering that a blended annuity table is intended primarily for use with a retirement plan, it seems reasonable to choose age 65 as the pivotal age at which the ratio of male l_x to total l_x would be applied. Since the ratio has to be applied at the same single age for both males and females, the use of age 65 for males and 60 for females is ruled out.

Before selecting age 65 as the pivotal age for the blended versions of the individual annuity 1983 Table a, an analysis was made of the effects of a choice of pivotal age on the ratios of male l_x to total l_x at lower and higher ages and on the resulting blended mortality rates. Precedent can be cited in the choice of age 65 by the Teachers Insurance & Annuity Association/College Retirement Equities Fund (TIAA/CREF) in 1980 after the company

[3] *TSA*, XXX (1981): 675.
[4] *TSA*, XXXVII (1985): 393.

decided to issue non-sex-distinct annuities. In evaluating this precedent, however, it must be kept in mind that the clientele of TIAA/CREF may not be representative of retirees in the employee groups likely to be covered under most plans.

An analysis was made of the most recently published insured annuity experience—that on pension trust business from 1971 to 1976 contract anniversaries.[5] Expected death rates were obtained for contract year 1, age group 60–69 (the preponderant age group) by dividing the expected deaths by the exposures. Corresponding ages were obtained by entering the 1971 Individual Annuity Mortality (IAM) tables. For both males and females, the ages were fractionally above and below age 65 in every category.

Tables 18 through 21 illustrate the effects on the ratios of male l_x at

TABLE 18

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 TABLE a—PIVOTAL AGE IS 45

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	80.10%	60.15%	50.16%	40.15%	20.10%
45	80.00	60.00	50.00	40.00	20.00
55	79.66	59.49	49.47	39.49	19.66
65	79.01	58.54	48.49	38.56	19.05
75	77.39	56.21	46.11	36.32	17.62
85	73.50	50.98	40.95	31.61	14.77
95	68.45	44.86	35.17	26.56	11.94

TABLE 19

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 TABLE a—PIVOTAL AGE IS 55

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	80.44%	60.66%	50.69%	40.66%	20.45%
45	80.34	60.51	50.53	40.51	20.34
55	80.00	60.00	50.00	40.00	20.00
65	79.37	59.06	49.02	39.06	19.38
75	77.76	56.73	46.64	36.82	17.93
85	73.91	51.51	41.46	32.07	15.04
95	68.91	45.39	35.66	26.98	12.17

[5] "Mortality under Individual Immediate Annuities, Life Income Settlements, and Matured Deferred Annuities between 1971 and 1976 Anniversaries," *TSA 1979 Reports* (1980): 63.

TABLE 20

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 TABLE a—PIVOTAL AGE IS 65

Age	Percent of Male l_x to Total l_x at Pivotal Age				
x	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	81.05%	61.59%	51.67%	41.61%	21.09%
45	80.95	61.44	51.51	41.46	20.99
55	80.62	60.94	50.98	40.94	20.63
65	80.00	60.00	50.00	40.00	20.00
75	78.43	57.69	47.62	37.73	18.52
85	74.66	52.49	42.42	32.94	15.55
95	69.75	46.37	36.56	27.76	12.59

TABLE 21

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 TABLE a—PIVOTAL AGE IS 75

Age	Percent of Male l_x to Total l_x at Pivotal Age				
x	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	82.47%	63.82%	54.05%	43.95%	22.72%
45	82.38	63.68	53.89	43.79	22.61
55	82.07	63.18	53.36	43.27	22.24
65	81.48	62.27	52.38	42.31	21.57
75	80.00	60.00	50.00	40.00	20.00
85	76.42	54.87	44.76	35.08	16.85
95	71.72	48.75	38.80	29.71	13.68

illustrative ages 35 through 95 for pivotal ages 45, 55, 65, and 75. Tables 22 through 25 show the effects on blended mortality rates of both the choice of a pivotal age and the change in percent male l_x to total l_x at the pivotal age. Mortality rates for 100 percent male and 100 percent female appear in Tables 22 through 25 to facilitate comparison.

These tables show that the choice of a pivotal age has an insignificant effect on the l_x ratios and the mortality rates at the young ages. On the other hand, superior female survivorship is evident when comparing the effects at age 75 and over of the choice of pivotal age.

The choice of age 55 or lower has little to recommend it, and age 75 is not representative of usual retirement ages. The progression of a usual retirement age in the future seems somewhat doubtful considering on the one hand the elimination of compulsory retirement at any age and the proliferation of incentive plans for early retirement on the other. Based on this, the use of age 65 as the pivotal age seems a natural choice.

TABLE 22

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 TABLE a—PIVOTAL AGE IS 45

Age X	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35..........	0.917	0.843	0.769	0.732	0.694	0.620	0.545
45..........	2.399	2.144	1.888	1.761	1.633	1.377	1.122
55..........	5.994	5.363	4.737	4.426	4.116	3.501	2.891
65..........	12.851	11.694	10.564	10.010	9.462	8.387	7.336
75..........	35.046	31.672	28.512	27.006	25.546	22.756	20.127
85..........	90.987	84.238	78.503	75.947	73.569	69.281	65.518
95..........	191.214	185.855	181.849	180.202	178.739	176.257	174.228

TABLE 23

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 TABLE a—PIVOTAL AGE IS 55

Age X	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35..........	0.917	0.844	0.771	0.734	0.696	0.621	0.545
45..........	2.399	2.148	1.895	1.767	1.639	1.382	1.122
55..........	5.994	5.373	4.753	4.442	4.132	3.512	2.891
65..........	12.851	11.713	10.593	10.039	9.490	8.405	7.336
75..........	35.046	31.728	28.590	27.085	25.620	22.802	20.127
85..........	90.987	84.343	78.638	76.078	73.687	69.349	65.518
95..........	191.214	185.933	181.938	180.285	178.810	176.295	174.228

TABLE 24

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 TABLE a—PIVOTAL AGE IS 65

Age X	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35..........	0.917	0.846	0.774	0.737	0.700	0.623	0.545
45..........	2.399	2.156	1.907	1.780	1.651	1.390	1.122
55..........	5.994	5.393	4.782	4.473	4.162	3.531	2.891
65..........	12.851	11.748	10.645	10.094	9.542	8.439	7.336
75..........	35.046	31.828	28.734	27.231	25.756	22.889	20.127
85..........	90.987	84.534	78.887	76.321	73.906	69.479	65.518
95..........	191.214	186.075	182.104	180.438	178.943	176.367	174.228

58

TABLE 25

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 TABLE a—PIVOTAL AGE IS 75

| Age | Percent of Male l_x to Total l_x at Pivotal Age | | | | | | |
x	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35...........	0.917	0.852	0.782	0.746	0.708	0.630	0.545
45...........	2.399	2.174	1.935	1.810	1.681	1.411	1.122
55...........	5.994	5.438	4.852	4.547	4.234	3.581	2.891
65...........	12.851	11.830	10.770	10.225	9.669	8.526	7.336
75...........	35.046	32.062	29.078	27.586	26.095	23.111	20.127
85...........	90.987	84.983	79.492	76.919	74.452	69.809	65.518
95...........	191.214	186.410	182.508	180.819	179.275	176.552	174.228

Tables 26 and 27 show, respectively, single premiums for $1 monthly payment and the amount of monthly payment purchased by $1,000 calculated at 4 percent interest. Values are shown for 80, 60, 50, 40, and 20 percent ratios of male l_x to total l_x at pivotal age 65. Values for 100 percent male and 100 percent female are also shown for comparison. The tables show figures for a life annuity, life with 10 years certain and life with 20 years certain. The progression of the values from 100 percent male to 100 percent female is quite unremarkable. As expected, the rate of progression is greatest for the life annuity and least for life with 20 years certain.

Tables 28 and 29 show annuity values computed at 7.5 percent interest in order to (1) illustrate the effect of a change in interest and (2) permit comparison with corresponding annuity values computed on blended versions of the 1983 GAM table in Tables 39 and 40.

Table 30 provides a comparison of some of the values in Table 26 expressed in terms of the excess of the 80, 50, and 20 percent single premiums over corresponding 100 percent male single premiums. At age 65, the excess, on a life annuity at 7.5 percent interest, ranges from 1.9 percent for 80 percent male to 4.8 percent for 50 percent male and 7.7 percent for 20 percent male. Excesses are larger at age 75 and smaller at ages 55 and 45. As expected, the excess decreases with increase in the period certain.

Tables of $1,000q_x$ and l_x are provided in Appendix C for each of five ratios of male l_x to total l_x—80, 60, 50, 40, and 20 percent—with age 65 as the pivotal age. The calculations used the same computer program that was used for the blended 1980 CSO mortality tables, and the values of l_x were taken from the Report of the Committee to Recommend a New Mortality Basis for Individual Annuity Valuation (Derivation of the 1983 Table a).[7]

[7] *TSA* XXXIII (1981): 723–724.

TABLE 26

1983 TABLE a—INTEREST RATE = 4%
$1 MONTHLY PAYMENT SINGLE PREMIUM

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25...........	264.109	265.672	267.277	268.098	268.929	270.628	272.376
30...........	255.892	257.721	259.599	260.557	261.529	263.513	265.554
35...........	246.054	248.200	250.401	251.524	252.662	254.985	257.373
40...........	234.340	236.854	239.431	240.745	242.076	244.791	247.578
45...........	220.823	223.710	226.664	228.169	229.691	232.793	235.972
50...........	205.790	208.978	212.232	213.884	215.554	218.947	222.413
55...........	189.188	192.604	196.072	197.827	199.595	203.175	206.811
60...........	170.559	174.175	177.822	179.658	181.503	185.215	188.961
65...........	149.783	153.599	157.414	159.322	161.230	165.046	168.861
70...........	127.929	131.805	135.625	137.516	139.393	143.107	146.770
75...........	106.215	109.817	113.279	114.961	116.612	119.820	122.911
80...........	85.645	88.695	91.517	92.850	94.136	96.571	98.844
85...........	67.613	69.846	71.801	72.689	73.524	75.057	76.427
	10 Years Certain and Life						
25...........	264.416	265.953	267.533	268.339	269.157	270.828	272.547
30...........	256.269	258.067	259.914	260.857	261.812	263.763	265.770
35...........	246.566	248.669	250.826	251.927	253.042	255.319	257.659
40...........	235.197	237.628	240.120	241.391	242.679	245.305	248.000
45...........	222.309	225.041	227.837	229.261	230.702	233.637	236.646
50...........	208.094	211.049	214.064	215.596	217.143	220.287	223.499
55...........	192.459	195.569	198.727	200.324	201.935	205.193	208.504
60...........	175.336	178.543	181.777	183.406	185.041	188.334	191.656
65...........	157.375	160.540	163.705	165.288	166.870	170.035	173.200
70...........	140.061	142.898	145.696	147.080	148.454	151.173	153.856
75...........	124.981	127.157	129.249	130.265	131.262	133.201	135.069
80...........	113.499	114.842	116.084	116.671	117.237	118.309	119.309
85...........	106.058	106.710	107.280	107.540	107.784	108.231	108.631
	20 Years Certain and Life						
25...........	265.259	266.728	268.238	269.008	269.790	271.387	273.030
30...........	257.466	259.161	260.901	261.789	262.690	264.529	266.420
35...........	248.475	250.396	252.367	253.373	254.392	256.472	258.609
40...........	238.289	240.414	242.592	243.702	244.827	247.122	249.477
45...........	227.023	229.299	231.629	232.815	234.016	236.462	238.969
50...........	214.960	217.298	219.685	220.898	222.122	224.611	227.154
55...........	202.588	204.849	207.144	208.305	209.476	211.844	214.251
60...........	190.707	192.690	194.690	195.697	196.708	198.744	200.798
65...........	180.538	182.028	183.518	184.263	185.009	186.499	187.989
70...........	173.273	174.151	175.018	175.446	175.872	176.714	177.544
75...........	169.102	169.488	169.858	170.038	170.215	170.558	170.889
80...........	167.256	167.386	167.506	167.563	167.617	167.721	167.818
85...........	166.690	166.718	166.744	166.755	166.766	166.786	166.803

60

TABLE 27

1983 TABLE a—INTEREST RATE = 4%
MONTHLY PAYMENT PER $1,000

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25.	3.79	3.76	3.74	3.73	3.72	3.70	3.67
30.	3.91	3.88	3.85	3.84	3.82	3.79	3.77
35.	4.06	4.03	3.99	3.98	3.96	3.92	3.89
40.	4.27	4.22	4.18	4.15	4.13	4.09	4.04
45.	4.53	4.47	4.41	4.38	4.35	4.30	4.24
50.	4.86	4.79	4.71	4.68	4.64	4.57	4.50
55.	5.29	5.19	5.10	5.05	5.01	4.92	4.84
60.	5.86	5.74	5.62	5.57	5.51	5.40	5.29
65.	6.68	6.51	6.35	6.28	6.20	6.06	5.92
70.	7.82	7.59	7.37	7.27	7.17	6.99	6.81
75.	9.41	9.11	8.83	8.70	8.58	8.35	8.14
80.	11.68	11.27	10.93	10.77	10.62	10.36	10.12
85.	14.79	14.32	13.93	13.76	13.60	13.32	13.08
	10 Years Certain and Life						
25.	3.78	3.76	3.74	3.73	3.72	3.69	3.67
30.	3.90	3.87	3.85	3.83	3.82	3.79	3.76
35.	4.06	4.02	3.99	3.97	3.95	3.92	3.88
40.	4.25	4.21	4.16	4.14	4.12	4.08	4.03
45.	4.50	4.44	4.39	4.36	4.33	4.28	4.23
50.	4.81	4.74	4.67	4.64	4.61	4.54	4.47
55.	5.20	5.11	5.03	4.99	4.95	4.87	4.80
60.	5.70	5.60	5.50	5.45	5.40	5.31	5.22
65.	6.35	6.23	6.11	6.05	5.99	5.88	5.77
70.	7.14	7.00	6.86	6.80	6.74	6.61	6.50
75.	8.00	7.86	7.74	7.68	7.62	7.51	7.40
80.	8.81	8.71	8.61	8.57	8.53	8.45	8.38
85.	9.43	9.37	9.32	9.30	9.28	9.24	9.21
	20 Years Certain and Life						
25.	3.77	3.75	3.73	3.72	3.71	3.68	3.66
30.	3.88	3.86	3.83	3.82	3.81	3.78	3.75
35.	4.02	3.99	3.96	3.95	3.93	3.90	3.87
40.	4.20	4.16	4.12	4.10	4.08	4.05	4.01
45.	4.40	4.36	4.32	4.30	4.27	4.23	4.18
50.	4.65	4.60	4.55	4.53	4.50	4.45	4.40
55.	4.94	4.88	4.83	4.80	4.77	4.72	4.67
60.	5.24	5.19	5.14	5.11	5.08	5.03	4.98
65.	5.54	5.49	5.45	5.43	5.41	5.36	5.32
70.	5.77	5.74	5.71	5.70	5.69	5.66	5.63
75.	5.91	5.90	5.89	5.88	5.87	5.86	5.85
80.	5.98	5.97	5.97	5.97	5.97	5.96	5.96
85.	6.00	6.00	6.00	6.00	6.00	6.00	6.00

The mortality tables in Appendix C are identified by the same letter codes that were adopted by the NAIC for the blended 1980 CSO tables, viz., B for 80 percent male, C for 60 percent, D for 50 percent, E for 40 percent,

TABLE 28

1983 TABLE a—INTEREST RATE = 7.5%
$1 MONTHLY PAYMENT SINGLE PREMIUM

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25...........	160.385	160.771	161.167	161.369	161.574	161.994	162.425
30...........	158.365	158.868	159.385	159.648	159.915	160.461	161.022
35...........	155.586	156.252	156.934	157.282	157.635	158.355	159.095
40...........	151.791	152.674	153.580	154.042	154.510	155.464	156.444
45...........	146.886	148.025	149.192	149.786	150.387	151.612	152.867
50...........	140.917	142.305	143.721	144.440	145.166	146.643	148.151
55...........	133.706	135.328	136.975	137.808	138.647	140.347	142.074
60...........	124.712	126.590	128.485	129.438	130.396	132.325	134.270
65...........	113.509	115.694	117.879	118.972	120.064	122.249	124.434
70...........	100.540	102.980	105.385	106.575	107.756	110.094	112.400
75...........	86.526	88.985	91.350	92.498	93.625	95.816	97.927
80...........	72.189	74.427	76.499	77.477	78.420	80.208	81.876
85...........	58.780	60.518	62.039	62.730	63.380	64.573	65.640
	10 Years Certain and Life						
25...........	160.606	160.971	161.346	161.538	161.732	162.128	162.536
30...........	158.642	159.121	159.612	159.863	160.117	160.636	161.170
35...........	155.971	156.602	157.249	157.579	157.913	158.596	159.298
40...........	152.450	153.268	154.106	154.533	154.966	155.849	156.756
45...........	148.051	149.066	150.106	150.635	151.171	152.262	153.380
50...........	142.745	143.944	145.168	145.789	146.417	147.693	148.996
55...........	136.313	137.688	139.084	139.791	140.502	141.943	143.407
60...........	128.525	130.073	131.635	132.422	133.211	134.802	136.406
65...........	119.582	121.244	122.906	123.737	124.568	126.230	127.892
70...........	110.276	111.877	113.455	114.236	115.011	116.546	118.059
75...........	101.633	102.934	104.185	104.792	105.388	106.547	107.663
80...........	94.710	95.547	96.321	96.686	97.039	97.707	98.331
85...........	90.042	90.459	90.824	90.990	91.146	91.432	91.688
	20 Years Certain and Life						
25...........	161.101	161.425	161.758	161.928	162.100	162.452	162.814
30...........	159.345	159.762	160.190	160.409	160.630	161.082	161.547
35...........	157.098	157.620	158.156	158.430	158.707	159.273	159.854
40...........	154.289	154.923	155.573	155.904	156.239	156.924	157.627
45...........	150.870	151.610	152.369	152.755	153.146	153.942	154.758
50...........	146.855	147.682	148.527	148.956	149.390	150.271	151.171
55...........	142.373	143.237	144.115	144.559	145.007	145.913	146.833
60...........	137.732	138.543	139.362	139.774	140.188	141.022	141.862
65...........	133.501	134.146	134.791	135.113	135.436	136.081	136.726
70...........	130.326	130.723	131.113	131.306	131.498	131.878	132.253
75...........	128.433	128.612	128.784	128.867	128.949	129.108	129.262
80...........	127.568	127.630	127.687	127.714	127.740	127.789	127.835
85...........	127.295	127.309	127.321	127.327	127.332	127.342	127.351

and F for 20 percent male. Code A could be used to identify the 100 percent male table and G for the 100 percent female table.

Mortality improvement factors such as Projection Scale G for the 1983

TABLE 29

1983 TABLE a—INTEREST RATE = 7.5%
MONTHLY PAYMENT PER $1,000

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25..........	6.23	6.22	6.20	6.20	6.19	6.17	6.16
30..........	6.31	6.29	6.27	6.26	6.25	6.23	6.21
35..........	6.43	6.40	6.37	6.36	6.34	6.31	6.29
40..........	6.59	6.55	6.51	6.49	6.47	6.43	6.39
45..........	6.81	6.76	6.70	6.68	6.65	-6.60	6.54
50..........	7.10	7.03	6.96	6.92	6.89	6.82	6.75
55..........	7.48	7.39	7.30	7.26	7.21	7.13	7.04
60..........	8.02	7.90	7.78	7.73	7.67	7.56	7.45
65..........	8.81	8.64	8.48	8.41	8.33	8.18	8.04
70..........	9.95	9.71	9.49	9.38	9.28	9.08	8.90
75..........	11.56	11.24	10.95	10.81	10.68	10.44	10.21
80..........	13.85	13.44	13.07	12.91	12.75	12.47	12.21
85..........	17.01	16.52	16.12	15.94	15.78	15.49	15.23
	10 Years Certain and Life						
25..........	6.23	6.21	6.20	6.19	6.18	6.17	6.15
30..........	6.30	6.28	6.27	6.26	6.25	6.23	6.20
35..........	6.41	6.39	6.36	6.35	6.33	6.31	6.28
40..........	6.56	6.52	6.49	6.47	6.45	6.42	6.38
45..........	6.75	6.71	6.66	6.64	6.62	6.57	6.52
50..........	7.01	6.95	6.89	6.86	6.83	6.77	6.71
55..........	7.34	7.26	7.19	7.15	7.12	7.05	6.97
60..........	7.78	7.69	7.60	7.55	7.51	7.42	7.33
65..........	8.36	8.25	8.14	8.08	8.03	7.92	7.82
70..........	9.07	8.94	8.81	8.75	8.69	8.58	8.47
75..........	9.84	9.71	9.60	9.54	9.49	9.39	9.29
80..........	10.56	10.47	10.38	10.34	10.31	10.23	10.17
85..........	11.11	11.05	11.01	10.99	10.97	10.94	10.91
	20 Years Certain and Life						
25..........	6.21	6.19	6.18	6.18	6.17	6.16	6.14
30..........	6.28	6.26	6.24	6.23	6.23	6.21	6.19
35..........	6.37	6.34	6.32	6.31	6.30	6.28	6.26
40..........	6.48	6.45	6.43	6.41	6.40	6.37	6.34
45..........	6.63	6.60	6.56	6.55	6.53	6.50	6.46
50..........	6.81	6.77	6.73	6.71	6.69	6.65	6.62
55..........	7.02	6.98	6.94	6.92	6.90	6.85	6.81
60..........	7.26	7.22	7.18	7.15	7.13	7.09	7.05
65..........	7.49	7.45	7.42	7.40	7.38	7.35	7.31
70..........	7.67	7.65	7.63	7.62	7.60	7.58	7.56
75..........	7.79	7.78	7.76	7.76	7.75	7.75	7.74
80..........	7.84	7.84	7.83	7.83	7.83	7.83	7.82
85..........	7.86	7.85	7.85	7.85	7.85	7.85	7.85

Table a should not be applied to blended mortality rates. Rather, the improvement rates should be applied separately to the respective male and

TABLE 30

EFFECT OF PERCENT MALE ON ANNUITY SINGLE PREMIUMS
1983 TABLE a—PIVOTAL AGE IS 65

EXCESS (PERCENT) OVER 100% MALE VALUES
(Based on $1 Monthly Payment Single Premiums at 7.5% Interest)

Age x	Life Annuity			Life and 10 Years			Life and 20 Years		
	80%	50%	20%	80%	50%	20%	80%	50%	20%
45	0.8%	2.0%	3.2%	0.7%	1.7%	2.8%	0.5%	1.2%	2.0%
55	1.2	3.1	5.0	1.0	2.6	4.1	0.6	1.5	2.5
65	1.9	4.8	7.7	1.4	3.5	5.6	0.5	1.2	1.9
75	2.8	6.9	10.7	1.3	3.1	4.8	0.1	0.3	0.5

female mortality rates and new blended projected tables constructed. Considering the already substantial differences between male and female mortality, the fact that female mortality improvement rates are higher than the male rates and the effect of compounding the improvement rates over any reasonable period of years, there is a good chance that an approximate method may develop unacceptable deviations from what would be obtained from an exact method.

BLENDED GROUP ANNUITY MORTALITY TABLES

For the same reasons set forth previously as to the need for blended individual annuity mortality tables, blended 1983 GAM table rates have also been provided in this paper. For the same reasons as given with respect to the individual annuity tables, age 65 was chosen as the pivotal age for the group annuity tables.

The same five blends of male l_x and female l_x are presented for the 1983 GAM tables as for the 1980 CSO tables and the individual annuity tables, viz., 80, 60, 50, 40, and 20 percent male. The male and female mortality rates used in the calculations are the rates in the final published report of the Committee on Annuities.[8]

Tables 31 through 34 compare the effects of a choice of pivotal age—45, 55, 65, and 75—on the percent of male l_x to total l_x at ages above and below the pivotal age. Note that the choice of pivotal age, up to age 65, has a negligible effect on the proportions of male l_x to total at ages 35 and 45, and even at age 55. However, the effect of a choice of pivotal age is much greater at ages 75 and over, reinforcing the choice of age 65 as the highest pivotal age that would have the least effect at other ages and is within the practical range of usual retirement ages.

[8] COMMITTEE ON ANNUITIES, "Development of the 1983 Group Annuity Mortality Table," *TSA* XXXV (1983): 880–881.

TABLE 31

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 GAM—PIVOTAL AGE IS 45

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	80.10%	60.15%	50.15%	40.15%	20.10%
45	80.00	60.00	50.00	40.00	20.00
55	79.65	59.47	49.45	39.47	19.65
65	78.81	58.24	48.18	38.26	18.86
75	76.29	54.68	44.57	34.90	16.74
85	69.92	46.57	36.75	27.92	12.69
95	55.98	32.29	24.12	17.49	7.36

TABLE 32

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 GAM—PIVOTAL AGE IS 55

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	80.44%	60.67%	50.70%	40.67%	20.45%
45	80.35	60.53	50.55	40.53	20.35
55	80.00	60.00	50.00	40.00	20.00
65	79.17	58.77	48.73	38.78	19.20
75	76.68	55.22	45.12	35.40	17.05
85	70.38	47.12	37.27	28.37	12.93
95	56.52	32.77	24.53	17.81	7.51

TABLE 33

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 GAM—PIVOTAL AGE IS 65

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	81.23%	61.88%	51.97%	41.91%	21.29%
45	81.14	61.74	51.82	41.76	21.19
55	80.80	61.22	51.27	41.23	20.83
65	80.00	60.00	50.00	40.00	20.00
75	77.58	56.48	46.38	36.58	17.78
85	71.43	48.39	38.46	29.41	13.51
95	57.77	33.90	25.48	18.57	7.88

TABLE 34

EFFECT OF PIVOTAL AGE ON PERCENT MALE l_x TO TOTAL l_x BY AGE
1983 GAM—PIVOTAL AGE IS 75

Age X	Percent of Male l_x to Total l_x at Pivotal Age				
	80%	60%	50%	40%	20%
	Ratio of Male l_x to Total l_x at Table Age X				
35	83.34%	65.24%	55.58%	45.47%	23.82%
45	83.26	65.10	55.43	45.32	23.71
55	82.95	64.60	54.88	44.78	23.32
65	82.22	63.42	53.62	43.52	22.42
75	80.00	60.00	50.00	40.00	20.00
85	74.30	52.01	41.95	32.51	15.30
95	61.26	37.22	28.33	20.86	8.99

Tables 35 through 38 compare blended mortality rates for pivotal ages 45, 55, 65, and 75. These tables also show mortality rates for 100 percent males and 100 percent females in addition to those for the five blends. In comparing the rates in these tables at the higher ages, the choice of age 65 as the pivotal age seems reasonable.

Tables 39 and 40 present, respectively, single premiums for $1 monthly payment and amounts of monthly payment purchased by $1,000 at 7.5 percent interest. Values are shown for each of the five blends and for 100 percent males and 100 percent females.

The 7.5 percent 1983 GAM values can be compared with the 1983 Table a values at the same interest rate in Tables 28 and 29. As was the case for the corresponding individual annuity values, the progression of the group annuity values in Tables 39 and 40 with decreasing percent male is unremarkable. As expected, the differences are least for twenty years certain and greatest for straight life annuities.

Tables 41 and 42 present corresponding annuity values computed at 10 percent interest in order to provide annuity values computed at a contemporary interest rate.

Values of $1,000q_x$ and values of l_x for each of the five blended GAM tables appear in Appendix D. Following the suffix letter coding used by the NAIC in referring to the blended 1980 CSO mortality tables, 1983 GAM-B refers to the 80 percent male table; 1983 GAM-C refers to the 60 percent table, and D, E, and F refer to the 50, 40, and 20 percent tables, respectively.

TABLE 35

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 GAM—PIVOTAL AGE IS 45

Age x	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35...........	0.860	0.784	0.707	0.669	0.630	0.553	0.476
45...........	2.183	1.948	1.714	1.596	1.479	1.245	1.010
55...........	6.131	5.400	4.676	4.316	3.958	3.246	2.541
65...........	15.592	13.785	12.031	11.173	10.327	8.672	7.064
75...........	44.597	39.711	35.258	33.176	31.184	27.441	23.992
85...........	114.836	101.325	90.837	86.427	82.461	75.616	69.918
95...........	234.086	211.342	199.102	194.883	191.455	186.223	182.419

TABLE 36

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 GAM—PIVOTAL AGE IS 55

Age x	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35...........	0.860	0.785	0.709	0.671	0.632	0.555	0.476
45...........	2.183	1.952	1.720	1.603	1.485	1.249	1.010
55...........	6.131	5.413	4.695	4.336	3.977	3.259	2.541
65...........	15.592	13.816	12.076	11.219	10.371	8.701	7.064
75...........	44.597	39.792	35.370	33.288	31.287	27.505	23.992
85...........	114.836	101.531	91.083	86.657	82.660	75.726	69.918
95...........	234.086	211.621	199.351	195.091	191.619	186.301	182.419

TABLE 37

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 GAM — PIVOTAL AGE IS 65

Age x	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35...........	0.860	0.788	0.714	0.676	0.637	0.558	0.476
45...........	2.183	1.962	1.734	1.618	1.500	1.259	1.010
55...........	6.131	5.442	4.739	4.382	4.021	3.289	2.541
65...........	15.592	13.886	12.181	11.328	10.475	8.770	7.064
75...........	44.597	39.977	35.629	33.549	31.528	27.656	23.992
85...........	114.836	102.003	91.654	87.195	83.130	75.989	69.918
95...........	234.086	212.266	199.936	195.585	192.011	186.488	182.419

TABLE 38

EFFECT OF PIVOTAL AGE AND PERCENT MALE ON BLENDED MORTALITY RATES
1983 GAM — PIVOTAL AGE IS 75

Age x	Percent of Male l_x to Total l_x at Pivotal Age						
	100%	80%	60%	50%	40%	20%	0%
	Blended Mortality Rates per 1,000						
35...........	0.860	0.796	0.727	0.689	0.651	0.567	0.476
45...........	2.183	1.987	1.774	1.660	1.542	1.288	1.010
55...........	6.131	5.519	4.860	4.511	4.149	3.378	2.541
65...........	15.592	14.076	12.473	11.637	10.776	8.976	7.064
75...........	44.597	40.476	36.355	34.295	32.234	28.113	23.992
85...........	114.836	103.290	93.281	88.760	84.521	76.791	69.918
95...........	234.086	214.070	201.652	197.057	193.196	187.066	182.419

68

TABLE 39

1983 GAM—INTEREST RATE = 7.5%
$1 MONTHLY PAYMENT SINGLE PREMIUM

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25	160.268	160.697	161.139	161.366	161.596	162.069	162.558
30	158.042	158.618	159.213	159.517	159.826	160.460	161.115
35	155.002	155.779	156.580	156.990	157.406	158.259	159.141
40	150.884	151.929	153.006	153.557	154.116	155.261	156.443
45	145.444	146.827	148.251	148.978	149.716	151.225	152.780
50	138.635	140.396	142.202	143.123	144.056	145.958	147.913
55	130.302	132.452	134.646	135.759	136.885	139.170	141.503
60	119.895	122.486	125.107	126.430	127.761	130.448	133.168
65	107.224	110.306	113.388	114.930	116.471	119.553	122.635
70	93.305	96.715	100.048	101.686	103.306	106.491	109.606
75	78.777	82.358	85.728	87.340	88.906	91.908	94.747
80	64.429	68.166	71.488	73.015	74.460	77.135	79.554
85	51.936	55.597	58.550	59.822	60.982	63.019	64.751
	10 Years Certain and Life						
25	160.431	160.844	161.269	161.487	161.708	162.162	162.632
30	158.277	158.831	159.402	159.694	159.992	160.601	161.231
35	155.357	156.100	156.866	157.259	157.657	158.473	159.317
40	151.486	152.470	153.484	154.002	154.529	155.607	156.719
45	146.541	147.804	149.104	149.768	150.442	151.820	153.240
50	140.461	142.017	143.614	144.427	145.251	146.933	148.659
55	133.079	134.931	136.821	137.780	138.749	140.717	142.726
60	124.332	126.458	128.610	129.696	130.788	132.993	135.225
65	114.788	117.061	119.334	120.470	121.607	123.880	126.152
70	105.493	107.698	109.852	110.911	111.958	114.018	116.031
75	97.523	99.450	101.263	102.130	102.973	104.588	106.116
80	91.769	93.209	94.488	95.076	95.633	96.663	97.595
85	88.313	89.126	89.782	90.065	90.323	90.776	91.160
	20 Years Certain and Life						
25	160.853	161.228	161.616	161.814	162.016	162.429	162.857
30	158.912	159.408	159.920	160.182	160.448	160.993	161.557
35	156.407	157.046	157.705	158.043	158.385	159.087	159.813
40	153.253	154.051	154.874	155.294	155.721	156.596	157.498
45	149.390	150.351	151.340	151.845	152.358	153.406	154.487
50	144.911	146.006	147.130	147.703	148.283	149.466	150.682
55	140.118	141.262	142.429	143.021	143.620	144.836	146.077
60	135.458	136.533	137.622	138.172	138.724	139.840	140.970
65	131.626	132.497	133.367	133.803	134.238	135.109	135.979
70	129.122	129.681	130.228	130.497	130.762	131.285	131.796
75	127.850	128.103	128.341	128.455	128.566	128.778	128.979
80	127.378	127.444	127.501	127.528	127.553	127.600	127.642
85	127.263	127.268	127.273	127.275	127.276	127.279	127.282

TABLE 40

1983 GAM—INTEREST RATE = 7.5%
MONTHLY PAYMENT PER $1,000

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25............	6.24	6.22	6.21	6.20	6.19	6.17	6.15
30............	6.33	6.30	6.28	6.27	6.26	6.23	6.21
35............	6.45	6.42	6.39	6.37	6.35	6.32	6.28
40............	6.63	6.58	6.54	6.51	6.49	6.44	6.39
45............	6.88	6.81	6.75	6.71	6.68	6.61	6.55
50............	7.21	7.12	7.03	6.99	6.94	6.85	6.76
55............	7.67	7.55	7.43	7.37	7.31	7.19	7.07
60............	8.34	8.16	7.99	7.91	7.83	7.67	7.51
65............	9.33	9.07	8.82	8.70	8.59	8.36	8.15
70............	10.72	10.34	10.00	9.83	9.68	9.39	9.12
75............	12.69	12.14	11.66	11.45	11.25	10.88	10.55
80............	15.52	14.67	13.99	13.70	13.43	12.96	12.57
85............	19.25	17.99	17.08	16.72	16.40	15.87	15.44
	10 Years Certain and Life						
25............	6.23	6.22	6.20	6.19	6.18	6.17	6.15
30............	6.32	6.30	6.27	6.26	6.25	6.23	6.20
35............	6.44	6.41	6.37	6.36	6.34	6.31	6.28
40............	6.60	6.56	6.52	6.49	6.47	6.43	6.38
45............	6.82	6.77	6.71	6.68	6.65	6.59	6.53
50............	7.12	7.04	6.96	6.92	6.88	6.81	6.73
55............	7.51	7.41	7.31	7.26	7.21	7.11	7.01
60............	8.04	7.91	7.78	7.71	7.65	7.52	7.40
65............	8.71	8.54	8.38	8.30	8.22	8.07	7.93
70............	9.48	9.29	9.10	9.02	8.93	8.77	8.62
75............	10.25	10.06	9.88	9.79	9.71	9.56	9.42
80............	10.90	10.73	10.58	10.52	10.46	10.35	10.25
85............	11.32	11.22	11.14	11.10	11.07	11.02	10.97
	20 Years Certain and Life						
25............	6.22	6.20	6.19	6.18	6.17	6.16	6.14
30............	6.29	6.27	6.25	6.24	6.23	6.21	6.19
35............	6.39	6.37	6.34	6.33	6.31	6.29	6.26
40............	6.53	6.49	6.46	6.44	6.42	6.39	6.35
45............	6.69	6.65	6.61	6.59	6.56	6.52	6.47
50............	6.90	6.85	6.80	6.77	6.74	6.69	6.64
55............	7.14	7.08	7.02	6.99	6.96	6.90	6.85
60............	7.38	7.32	7.27	7.24	7.21	7.15	7.09
65............	7.60	7.55	7.50	7.47	7.45	7.40	7.35
70............	7.74	7.71	7.68	7.66	7.65	7.62	7.59
75............	7.82	7.81	7.79	7.78	7.78	7.77	7.75
80............	7.85	7.85	7.84	7.84	7.84	7.84	7.83
85............	7.86	7.86	7.86	7.86	7.86	7.86	7.86

70

TABLE 41

1983 GAM—Interest Rate = 10%

$1 Monthly Payment Single Premium

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
Life Annuity							
25...........	124.234	124.415	124.603	124.699	124.797	124.997	125.204
30...........	123.253	123.513	123.780	123.918	124.057	124.342	124.638
35...........	121.804	122.180	122.567	122.766	122.967	123.379	123.806
40...........	119.682	120.227	120.789	121.076	121.367	121.964	122.580
45...........	116.668	117.444	118.244	118.652	119.066	119.913	120.786
50...........	112.682	113.735	114.815	115.365	115.923	117.061	118.230
55...........	107.542	108.900	110.286	110.989	111.700	113.143	114.617
60...........	100.693	102.425	104.178	105.062	105.953	107.749	109.567
65...........	91.781	93.971	96.161	97.256	98.351	100.540	102.730
70...........	81.464	84.015	86.508	87.734	88.945	91.328	93.658
75...........	70.170	72.971	75.608	76.869	78.094	80.443	82.664
80...........	58.492	61.554	64.274	65.524	66.708	68.898	70.879
85...........	47.968	51.094	53.614	54.700	55.690	57.429	58.907
10 Years Certain and Life							
25...........	124.349	124.516	124.689	124.777	124.867	125.051	125.242
30...........	123.429	123.669	123.917	124.044	124.173	124.438	124.711
35...........	122.084	122.431	122.788	122.971	123.157	123.538	123.931
40...........	120.173	120.665	121.173	121.433	121.696	122.236	122.793
45...........	117.586	118.259	118.952	119.306	119.665	120.399	121.156
50...........	114.230	115.107	116.006	116.464	116.928	117.875	118.847
55...........	109.911	111.012	112.135	112.705	113.281	114.450	115.644
60...........	104.488	105.820	107.168	107.848	108.533	109.914	111.313
65...........	98.274	99.766	101.257	102.002	102.748	104.239	105.731
70...........	91.965	93.470	94.941	95.664	96.379	97.785	99.160
75...........	86.364	87.727	89.010	89.624	90.221	91.363	92.445
80...........	82.210	83.262	84.196	84.625	85.032	85.784	86.464
85...........	79.662	80.271	80.763	80.974	81.167	81.506	81.795
20 Years Certain and Life							
25...........	124.636	124.778	124.924	124.998	125.074	125.230	125.391
30...........	123.866	124.066	124.272	124.378	124.485	124.704	124.932
35...........	122.811	123.085	123.367	123.512	123.659	123.960	124.271
40...........	121.406	121.768	122.141	122.332	122.525	122.922	123.331
45...........	119.582	120.043	120.516	120.758	121.004	121.506	122.023
50...........	117.353	117.904	118.470	118.759	119.051	119.647	120.259
55...........	114.854	115.455	116.069	116.381	116.696	117.335	117.988
60...........	112.322	112.910	113.505	113.805	114.107	114.717	115.335
65...........	110.169	110.661	111.154	111.400	111.646	112.139	112.631
70...........	108.725	109.051	109.369	109.526	109.680	109.985	110.282
75...........	107.977	108.128	108.270	108.338	108.404	108.531	108.650
80...........	107.695	107.735	107.770	107.786	107.801	107.830	107.855
85...........	107.625	107.628	107.631	107.632	107.633	107.635	107.637

71

TABLE 42

1983 GAM—INTEREST RATE = 10%
MONTHLY PAYMENT PER $1,000

Age	Ratio Percent Male l_x to Total l_x						
	100%	80%	60%	50%	40%	20%	0%
	Life Annuity						
25...........	8.05	8.04	8.03	8.02	8.01	8.00	7.99
30...........	8.11	8.10	8.08	8.07	8.06	8.04	8.02
35...........	8.21	8.18	8.16	8.15	8.13	8.11	8.08
40...........	8.36	8.32	8.28	8.26	8.24	8.20	8.16
45...........	8.57	8.51	8.46	8.43	8.40	8.34	8.28
50...........	8.87	8.79	8.71	8.67	8.63	8.54	8.46
55...........	9.30	9.18	9.07	9.01	8.95	8.84	8.72
60...........	9.93	9.76	9.60	9.52	9.44	9.28	9.13
65...........	10.90	10.64	10.40	10.28	10.17	9.95	9.73
70...........	12.28	11.90	11.56	11.40	11.24	10.95	10.68
75...........	14.25	13.70	13.23	13.01	12.81	12.43	12.10
80...........	17.10	16.25	15.56	15.26	14.99	14.51	14.11
85...........	20.85	19.57	18.65	18.28	17.96	17.41	16.98
	10 Years Certain and Life						
25...........	8.04	8.03	8.02	8.01	8.01	8.00	7.98
30...........	8.10	8.09	8.07	8.06	8.05	8.04	8.02
35...........	8.19	8.17	8.14	8.13	8.12	8.09	8.07
40...........	8.32	8.29	8.25	8.24	8.22	8.18	8.14
45...........	8.50	8.46	8.41	8.38	8.36	8.31	8.25
50...........	8.75	8.69	8.62	8.59	8.55	8.48	8.41
55...........	9.10	9.01	8.92	8.87	8.83	8.74	8.65
60...........	9.57	9.45	9.33	9.27	9.21	9.10	8.98
65...........	10.18	10.02	9.88	9.80	9.73	9.59	9.46
70...........	10.87	10.70	10.53	10.45	10.38	10.23	10.08
75...........	11.58	11.40	11.23	11.16	11.08	10.95	10.82
80...........	12.16	12.01	11.88	11.82	11.76	11.66	11.57
85...........	12.55	12.46	12.38	12.35	12.32	12.27	12.23
	20 Years Certain and Life						
25...........	8.02	8.01	8.00	8.00	8.00	7.99	7.98
30...........	8.07	8.06	8.05	8.04	8.03	8.02	8.00
35...........	8.14	8.12	8.11	8.10	8.09	8.07	8.05
40...........	8.24	8.21	8.19	8.17	8.16	8.14	8.11
45...........	8.36	8.33	8.30	8.28	8.26	8.23	8.20
50...........	8.52	8.48	8.44	8.42	8.40	8.36	8.32
55...........	8.71	8.66	8.62	8.59	8.57	8.52	8.48
60...........	8.90	8.86	8.81	8.79	8.76	8.72	8.67
65...........	9.08	9.04	9.00	8.98	8.96	8.92	8.88
70...........	9.20	9.17	9.14	9.13	9.12	9.09	9.07
75...........	9.26	9.25	9.24	9.23	9.22	9.21	9.20
80...........	9.29	9.28	9.28	9.28	9.28	9.27	9.27
85...........	9.29	9.29	9.29	9.29	9.29	9.29	9.29

The 100 percent male table could be referred to as 1983 GAM-A and the 100 percent female as 1983 GAM-G, again following the letter coding used for the blended 1980 CSO tables.

The Committee on Annuities stated in its report[9] that, according to tests using values at 7.5 percent and 10 percent interest, the 1983 GAM male table, set back six years, closely approximated the female table. The Committee also noted that the tables had been designed with this in mind.

The six-year setback suggests that one or more blended tables might also be approximated by age setbacks. Values of single premiums and amounts of monthly payment calculated at 7.5 percent and 10 percent interest were examined to find some useful relationships. The most obvious approximation turned out to be quite accurate. The male table with a three-year setback provides values very close to those derived from the 50 percent male blended mortality rates at 7.5 percent interest as shown by Table 43. Values at 10 percent interest were also close. See Appendix E for an extension to age 5 for the three-year setback 1983 GAM male table.

Similarly, the 80 percent male and 20 percent male tables can be closely approximated by one-year and five-year setbacks, respectively. The approximation for the 80 percent blend is not as close as that for the 20 percent blend. Integral age setbacks could not be found for the 60 and 40 percent

TABLE 43

1983 GROUP ANNUITY TABLE—TEST OF AGE SETBACKS
7.5% Interest

AGE	SINGLE PREMIUM		MONTHLY PAYMENT	
	20% Blended	Male-5 Years	20% Blended	Male-5 Years
55.............	139.170	138.635	7.19	7.21
60.............	130.448	130.302	7.67	7.67
65.............	119.553	119.895	8.36	8.34
70.............	106.491	107.224	9.39	9.33
	50% Blended	Male-3 Years	50% Blended	Male-3 Years
55.............	135.759	135.507	7.37	7.38
60.............	126.430	126.424	7.91	7.91
65.............	114.930	115.067	8.70	8.69
70.............	101.686	101.728	9.83	9.83
	80% Blended	Male-1 Year	80% Blended	Male-1 Year
55.............	132.452	132.112	7.55	7.57
60.............	122.486	122.169	8.16	8.19
65.............	110.306	109.905	9.07	9.10
70.............	96.715	96.130	10.34	10.40

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[9] Ibid., pp. 883–85.

male blended tables. Values computed at 10 percent interest were consistent with these conclusions.

It is the hope of the author that the blended mortality tables presented in this paper may prove useful to actuaries who are obliged to compute life insurance and annuity values on a non-sex-distinct basis.

ADDENDUM

In the report of the Task Force on Smoker/Nonsmoker Mortality Tables, *TSA 1982 Reports*, page 343, there is a discrepancy between the Appendix E and Appendix F mortality rates for ANB Male Nonsmoker age 71. Appendix E, which develops the Smoker and Nonsmoker rates, shows 38.31; Appendix F shows 38.91. Because the difference is so small and the Appendix F figures had already been adopted by the NAIC, the NAIC Life and Health Actuarial Task Force decided that no action need be taken.

Unfortunately, the corresponding Appendix F ANB CET mortality rate and the ALB age 70 and 71 CSO and CET rates were based on the Appendix E figure, 38.31. Thus, they are not obtainable by formula from the Appendix F figure. Again, the differences are small, as shown by the following table:

Table	Age	Based on Appendix E	Based on Appendix F	Difference
CSO ANB	71	38.31	38.91	0.60
CSO ALB	70	36.44	36.73	0.29
CSO ALB	71	40.39	40.70	0.31
CET ANB	71	49.80	50.58	0.78
CET ALB	70	47.37	47.75	0.38
CET ALB	71	52.51	52.91	0.40

The author, in a letter dated August 26, 1986, addressed to the Chairman and Vice Chairman of the NAIC Life and Health Actuarial Task Force, called attention to the discrepancies and suggested that, in view of the smallness of the differences, either the Appendix F figures or the formula figures be acceptable. The NAIC Task Force agreed.

1980 CSO-SB Smoker Table*
Pivotal Age Is 45
Ratio of Male l_x to Total Is 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15.............	223,083	1.51	60.............	173,641	20.93
16.............	222,746	1.70	61.............	170,007	22.72
17.............	222,367	1.85	62.............	166,144	24.75
18.............	221,956	1.95	63.............	162,032	27.09
19.............	221,523	2.04	64.............	157,643	29.66
20.............	221,071	2.09	65.............	152,967	32.45
21.............	220,609	2.10	66.............	148,003	35.33
22.............	220,146	2.09	67.............	142,774	38.33
23.............	219,686	2.06	68.............	137,301	41.34
24.............	219,233	2.03	69.............	131,625	44.56
25.............	218,788	1.97	70.............	125,760	48.06
26.............	218,357	1.93	71.............	119,716	52.02
27.............	217,936	1.92	72.............	113,488	56.56
28.............	217,518	1.92	73.............	107,069	61.72
29.............	217,100	1.94	74.............	100,461	67.39
30.............	216,679	1.99	75.............	93,691	73.64
31.............	216,248	2.06	76.............	86,792	80.11
32.............	215,803	2.13	77.............	79,839	86.64
33.............	215,343	2.23	78.............	72,922	93.17
34.............	214,863	2.35	79.............	66,128	99.91
35.............	214,358	2.50	80.............	59,521	107.14
36.............	213,822	2.67	81.............	53,144	115.11
37.............	213,251	2.89	82.............	47,027	124.03
38.............	212,635	3.14	83.............	41,194	134.01
39.............	211,967	3.43	84.............	35,674	144.97
40.............	211,240	3.75	85.............	30,502	156.08
41.............	210,448	4.14	86.............	25,741	167.75
42.............	209,577	4.53	87.............	21,423	179.03
43.............	208,628	4.97	88.............	17,588	191.74
44.............	207,591	5.42	89.............	14,216	204.04
45.............	206,466	5.94	90.............	11,315	217.42
46.............	205,240	6.45	91.............	8,855	231.58
47.............	203,916	7.01	92.............	6,804	246.88
48.............	202,487	7.60	93.............	5,124	265.45
49.............	200,948	8.25	94.............	3,764	289.36†
50.............	199,290	8.95	95.............	2,675	324.89†
51.............	197,506	9.74	96.............	1,806	380.97†
52.............	195,582	10.63	97.............	1,118	477.69†
53.............	193,503	11.64	98.............	584	657.38†
54.............	191,251	12.77	99.............	200	1,000.00
55.............	188,809	13.96			
56.............	186,173	15.24			
57.............	183,336	16.55			
58.............	180,302	17.93			
59.............	177,069	19.36			

* Age nearest birthday

† Adjusted; see text

CSO: Sum q_x = 6,901.22 Sum l_x = 12,302,728

1980 CET-SB Sᴍᴏᴋᴇʀ Tᴀʙʟᴇ*
Pɪᴠᴏᴛᴀʟ Aɢᴇ Is 45
Rᴀᴛɪᴏ ᴏꜰ Mᴀʟᴇ l_x ᴛᴏ Tᴏᴛᴀʟ Is 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	4,675,331	2.26	60	3,363,577	27.21
16	4,664,765	2.45	61	3,272,054	29.54
17	4,653,336	2.60	62	3,175,398	32.18
18	4,641,237	2.70	63	3,073,214	35.22
19	4,628,706	2.79	64	2,964,975	38.56
20	4,615,792	2.84	65	2,850,646	42.19
21	4,602,683	2.85	66	2,730,377	45.93
22	4,589,565	2.84	67	2,604,971	49.83
23	4,576,531	2.81	68	2,475,165	53.74
24	4,563,671	2.78	69	2,342,150	57.93
25	4,550,984	2.72	70	2,206,469	62.48
26	4,538,605	2.68	71	2,068,609	67.63
27	4,526,442	2.67	72	1,928,709	73.53
28	4,514,356	2.67	73	1,786,891	80.24
29	4,502,303	2.69	74	1,643,511	87.61
30	4,490,192	2.74	75	1,499,523	95.73
31	4,477,889	2.81	76	1,355,974	104.14
32	4,465,306	2.88	77	1,214,763	112.63
33	4,452,446	2.98	78	1,077,944	121.12
34	4,439,178	3.10	79	947,383	129.88
35	4,425,417	3.25	80	824,337	139.28
36	4,411,034	3.47	81	709,523	149.64
37	4,395,728	3.76	82	603,350	161.24
38	4,379,200	4.08	83	506,066	174.21
39	4,361,333	4.46	84	417,904	188.46
40	4,341,881	4.88	85	339,146	202.90
41	4,320,693	5.38	86	270,333	218.08
42	4,297,448	5.89	87	211,379	232.74
43	4,272,136	6.46	88	162,183	249.26
44	4,244,538	7.05	89	121,757	265.25
45	4,214,614	7.72	90	89,461	282.65
46	4,182,077	8.39	91	64,175	301.05
47	4,146,989	9.11	92	44,855	320.94
48	4,109,210	9.88	93	30,459	345.09
49	4,068,611	10.73	94	19,948	376.17
50	4,024,955	11.64	95	12,444	422.36
51	3,978,105	12.66	96	7,188	495.26
52	3,927,742	13.82	97	3,628	621.00
53	3,873,461	15.13	98	1,375	854.59
54	3,814,856	16.60	99	200	1,000.00
55	3,751,529	18.15			
56	3,683,439	19.81			
57	3,610,470	21.52			
58	3,532,773	23.31			
59	3,450,424	25.17			

* Age nearest birthday
CET: Sum q_x = 8,674.67 Sum l_x 242,009,995

1980 CSO-SC SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	161,242	1.37	60	127,934	18.74
16	161,021	1.52	61	125,537	20.27
17	160,776	1.65	62	122,992	22.02
18	160,511	1.74	63	120,284	24.08
19	160,232	1.82	64	117,388	26.36
20	159,940	1.86	65	114,294	28.83
21	159,643	1.88	66	110,999	31.35
22	159,343	1.87	67	107,519	33.97
23	159,045	1.85	68	103,867	36.55
24	158,751	1.84	69	100,071	39.31
25	158,459	1.81	70	96,137	42.29
26	158,172	1.79	71	92,071	45.73
27	157,889	1.79	72	87,861	49.75
28	157,606	1.79	73	83,490	54.37
29	157,324	1.83	74	78,951	59.53
30	157,036	1.88	75	74,251	65.21
31	156,741	1.95	76	69,409	71.12
32	156,435	2.02	77	64,473	77.16
33	156,119	2.11	78	59,498	83.23
34	155,790	2.23	79	54,546	89.55
35	155,443	2.35	80	49,661	96.42
36	155,078	2.52	81	44,873	104.08
37	154,687	2.74	82	40,203	112.72
38	154,263	2.98	83	35,671	122.47
39	153,803	3.25	84	31,302	133.48
40	153,303	3.56	85	27,124	144.59
41	152,757	3.94	86	23,202	156.67
42	152,155	4.31	87	19,567	168.41
43	151,499	4.71	88	16,272	181.66
44	150,785	5.14	89	13,316	194.45
45	150,010	5.61	90	10,727	208.76
46	149,168	6.08	91	8,488	223.98
47	148,261	6.59	92	6,587	240.65
48	147,284	7.12	93	5,002	260.28
49	146,235	7.71	94	3,700	285.17†
50	145,108	8.35	95	2,645	322.03†
51	143,896	9.05	96	1,793	378.56†
52	142,594	9.84	97	1,114	476.70†
53	141,191	10.75	98	583	657.10†
54	139,673	11.75	99	200	1,000.00
55	138,032	12.80			
56	136,265	13.92			
57	134,368	15.05			
58	132,346	16.21			
59	130,201	17.41			

* Age nearest birthday

† Adjusted; see text

CSO: Sum q_x = 6,617.94 Sum l_x = 9,084,082

1980 CET-SC SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	3,003,428	2.12	60	2,213,228	24.36
16	2,997,061	2.27	61	2,159,314	26.35
17	2,990,258	2.40	62	2,102,416	28.63
18	2,983,081	2.49	63	2,042,224	31.30
19	2,975,653	2.57	64	1,978,302	34.27
20	2,968,006	2.61	65	1,910,506	37.48
21	2,960,260	2.63	66	1,838,900	40.76
22	2,952,475	2.62	67	1,763,946	44.16
23	2,944,740	2.60	68	1,686,050	47.52
24	2,937,084	2.59	69	1,605,929	51.10
25	2,929,477	2.56	70	1,523,866	54.98
26	2,921,978	2.54	71	1,440,084	59.45
27	2,914,556	2.54	72	1,354,471	64.68
28	2,907,153	2.54	73	1,266,864	70.68
29	2,899,769	2.58	74	1,177,322	77.39
30	2,892,288	2.63	75	1,086,209	84.77
31	2,884,681	2.70	76	994,131	92.46
32	2,876,892	2.77	77	902,214	100.31
33	2,868,923	2.86	78	811,713	108.20
34	2,860,718	2.98	79	723,886	116.42
35	2,852,193	3.10	80	639,611	125.35
36	2,843,351	3.28	81	559,436	135.30
37	2,834,025	3.56	82	483,744	146.54
38	2,823,936	3.87	83	412,856	159.21
39	2,813,007	4.23	84	347,125	173.52
40	2,801,108	4.63	85	286,892	187.97
41	2,788,139	5.12	86	232,965	203.67
42	2,773,864	5.60	87	185,517	218.93
43	2,758,330	6.12	88	144,902	236.16
44	2,741,449	6.68	89	110,682	252.79
45	2,723,136	7.29	90	82,703	271.39
46	2,703,284	7.90	91	60,258	291.17
47	2,681,928	8.57	92	42,713	312.85
48	2,658,944	9.26	93	29,350	338.36
49	2,634,322	10.02	94	19,419	370.72
50	2,607,926	10.86	95	12,220	418.64
51	2,579,604	11.77	96	7,104	492.13
52	2,549,242	12.79	97	3,608	619.71
53	2,516,637	13.98	98	1,372	854.23
54	2,481,454	15.28	99	200	1,000.00
55	2,443,537	16.64			
56	2,402,877	18.10			
57	2,359,385	19.57			
58	2,313,212	21.07			
59	2,264,473	22.63			

* Age nearest birthday
CET: Sum q_x = 8,307.43 Sum l_x = 158,862,096

1980 CSO-SD SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	141,303	1.30	60	113,195	17.67
16	141,119	1.44	61	111,195	19.07
17	140,916	1.55	62	109,075	20.69
18	140,698	1.63	63	106,818	22.62
19	140,469	1.71	64	104,402	24.76
20	140,229	1.74	65	101,817	27.09
21	139,985	1.76	66	99,059	29.46
22	139,739	1.76	67	96,141	31.91
23	139,493	1.75	68	93,073	34.28
24	139,249	1.74	69	89,882	36.86
25	139,007	1.72	70	86,569	39.60
26	138,768	1.71	71	83,141	42.85
27	138,531	1.72	72	79,578	46.65
28	138,293	1.73	73	75,866	51.06
29	138,054	1.77	74	71,992	56.02
30	137,810	1.82	75	67,959	61.49
31	137,559	1.89	76	63,780	67.22
32	137,299	1.96	77	59,493	73.10
33	137,030	2.05	78	55,144	79.03
34	136,749	2.17	79	50,786	85.26
35	136,452	2.29	80	46,456	92.04
36	136,140	2.45	81	42,180	99.64
37	135,806	2.67	82	37,977	108.24
38	135,443	2.90	83	33,866	117.99
39	135,050	3.16	84	29,870	129.09
40	134,623	3.47	85	26,014	140.30
41	134,156	3.83	86	22,364	152.63
42	133,642	4.20	87	18,951	164.55
43	133,081	4.59	88	15,833	178.09
44	132,470	4.99	89	13,013	191.10
45	131,809	5.44	90	10,526	205.79
46	131,092	5.89	91	8,360	221.41
47	130,320	6.37	92	6,509	238.61
48	129,490	6.88	93	4,956	258.45
49	128,599	7.43	94	3,675	283.81†
50	127,644	8.04	95	2,632	320.74†
51	126,618	8.71	96	1,788	377.93†
52	125,515	9.46	97	1,112	476.61†
53	124,328	10.31	98	582	656.44†
54	123,046	11.25	99	200	1,000.00
55	121,662	12.23			
56	120,174	13.26			
57	118,580	14.30			
58	116,884	15.36			
59	115,089	16.46			

* Age nearest birthday
† Adjusted; see text
CSO: Sum q_x = 6,501.01 Sum l_x = 8,045,842

79

1980 CET-SD SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	2,503,786	2.05	60	1,867,210	22.97
16	2,498,653	2.19	61	1,824,320	24.79
17	2,493,181	2.30	62	1,779,095	26.90
18	2,487,447	2.38	63	1,731,237	29.41
19	2,481,527	2.46	64	1,680,321	32.19
20	2,475,422	2.49	65	1,626,231	35.22
21	2,469,258	2.51	66	1,568,955	38.30
22	2,463,060	2.51	67	1,508,864	41.48
23	2,456,878	2.50	68	1,446,276	44.56
24	2,450,736	2.49	69	1,381,830	47.92
25	2,444,634	2.47	70	1,315,613	51.48
26	2,438,596	2.46	71	1,247,885	55.71
27	2,432,597	2.47	72	1,178,365	60.65
28	2,426,588	2.48	73	1,106,897	66.38
29	2,420,570	2.52	74	1,033,421	72.83
30	2,414,470	2.57	75	958,157	79.94
31	2,408,265	2.64	76	881,562	87.39
32	2,401,907	2.71	77	804,522	95.03
33	2,395,398	2.80	78	728,068	102.74
34	2,388,691	2.92	79	653,266	110.84
35	2,381,716	3.04	80	580,858	119.65
36	2,374,476	3.20	81	511,358	129.53
37	2,366,878	3.47	82	445,122	140.71
38	2,358,665	3.77	83	382,489	153.39
39	2,349,773	4.11	84	323,819	167.82
40	2,340,115	4.51	85	269,476	182.39
41	2,329,561	4.98	86	220,326	198.42
42	2,317,960	5.46	87	176,609	213.92
43	2,305,304	5.97	88	138,829	231.52
44	2,291,541	6.49	89	106,687	248.43
45	2,276,669	7.07	90	80,183	267.53
46	2,260,573	7.66	91	58,732	287.83
47	2,243,257	8.28	92	41,827	310.19
48	2,224,683	8.94	93	28,853	335.99
49	2,204,794	9.66	94	19,159	368.95
50	2,183,496	10.45	95	12,090	416.96
51	2,160,678	11.32	96	7,049	491.31
52	2,136,219	12.30	97	3,586	619.59
53	2,109,944	13.40	98	1,364	853.37
54	2,081,671	14.63	99	200	1,000.00
55	2,051,216	15.90			
56	2,018,602	17.24			
57	1,983,801	18.59			
58	1,946,922	19.97			
59	1,908,042	21.40			

*Age nearest birthday
CET: Sum q_x = 8,155.96 Sum l_x = 133,888,931

1980 CSO-SE SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	125,734	1.22	60	101,679	16.61
16	125,581	1.35	61	99,990	17.89
17	125,411	1.45	62	98,201	19.38
18	125,229	1.52	63	96,298	21.20
19	125,039	1.59	64	94,256	23.20
20	124,840	1.63	65	92,069	25.40
21	124,637	1.65	66	89,730	27.62
22	124,431	1.65	67	87,252	29.91
23	124,226	1.65	68	84,642	32.12
24	124,021	1.65	69	81,923	34.50
25	123,816	1.64	70	79,097	37.05
26	123,613	1.64	71	76,166	40.10
27	123,410	1.66	72	73,112	43.72
28	123,205	1.67	73	69,916	47.97
29	122,999	1.71	74	66,562	52.76
30	122,789	1.77	75	63,050	58.07
31	122,572	1.84	76	59,389	63.65
32	122,346	1.91	77	55,609	69.39
33	122,112	1.99	78	51,750	75.26
34	121,869	2.11	79	47,855	81.40
35	121,612	2.22	80	43,960	88.17
36	121,342	2.38	81	40,084	95.75
37	121,053	2.59	82	36,246	104.35
38	120,739	2.82	83	32,464	114.13
39	120,399	3.08	84	28,759	125.35
40	120,028	3.38	85	25,154	136.67
41	119,622	3.73	86	21,716	149.23
42	119,176	4.09	87	18,475	161.37
43	118,689	4.46	88	15,494	175.15
44	118,160	4.85	89	12,780	188.35
45	117,587	5.28	90	10,373	203.38
46	116,966	5.70	91	8,263	219.41
47	116,299	6.16	92	6,450	236.87
48	115,583	6.64	93	4,922	257.15
49	114,816	7.16	94	3,656	282.58†
50	113,994	7.74	95	2,623	319.76†
51	113,112	8.36	96	1,784	377.41†
52	112,166	9.07	97	1,111	476.21†
53	111,149	9.87	98	582	656.10†
54	110,052	10.74	99	200	1,000.00
55	108,870	11.65			
56	107,602	12.61			
57	106,245	13.57			
58	104,803	14.52			
59	103,281	15.51			

* Age nearest birthday
† Adjusted; see text
CSO: Sum q_x = 6,396.07 Sum l_x = 7,234,867

1980 CET-SE Smoker Table*
Pivotal Age Is 45
Ratio of Male l_x to Total Is 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	2,133,431	1.97	60	1,609,925	21.59
16	2,129,228	2.10	61	1,575,167	23.26
17	2,124,757	2.20	62	1,538,529	25.19
18	2,120,083	2.27	63	1,499,773	27.56
19	2,115,270	2.34	64	1,458,439	30.16
20	2,110,320	2.38	65	1,414,452	33.02
21	2,105,297	2.40	66	1,367,747	35.91
22	2,100,244	2.40	67	1,318,631	38.88
23	2,095,203	2.40	68	1,267,363	41.76
24	2,090,175	2.40	69	1,214,438	44.85
25	2,085,159	2.39	70	1,159,970	48.17
26	2,080,175	2.39	71	1,104,094	52.13
27	2,075,203	2.41	72	1,046,538	56.84
28	2,070,202	2.42	73	987,053	62.36
29	2,065,192	2.46	74	925,500	68.59
30	2,060,112	2.52	75	862,020	75.49
31	2,054,921	2.59	76	796,946	82.75
32	2,049,599	2.66	77	730,999	90.21
33	2,044,147	2.74	78	665,056	97.84
34	2,038,546	2.86	79	599,987	105.82
35	2,032,716	2.97	80	536,496	114.62
36	2,026,679	3.13	81	475,003	124.48
37	2,020,335	3.37	82	415,875	135.66
38	2,013,526	3.67	83	359,457	148.37
39	2,006,136	4.00	84	306,124	162.96
40	1,998,111	4.39	85	256,238	177.67
41	1,989,339	4.85	86	210,712	194.00
42	1,979,691	5.32	87	169,834	209.78
43	1,969,159	5.80	88	134,206	227.70
44	1,957,738	6.31	89	103,647	244.86
45	1,945,385	6.86	90	78,268	264.39
46	1,932,040	7.41	91	57,575	285.23
47	1,917,724	8.01	92	41,153	307.93
48	1,902,363	8.63	93	28,481	334.30
49	1,885,946	9.31	94	18,960	367.35
50	1,868,388	10.06	95	11,995	415.69
51	1,849,592	10.87	96	7,009	490.63
52	1,829,487	11.79	97	3,570	619.07
53	1,807,917	12.83	98	1,360	852.93
54	1,784,721	13.96	99	200	1,000.00
55	1,759,806	15.15			
56	1,733,145	16.39			
57	1,704,739	17.64			
58	1,674,667	18.88			
59	1,643,049	20.16			

* Age nearest birthday
CET: Sum q_x = 8,020.06 Sum l_x = 115,338,453

1980 CSO-SF SMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	102,794	1.08	60	84,713	14.53
16	102,683	1.17	61	83,482	15.59
17	102,563	1.25	62	82,181	16.84
18	102,435	1.31	63	80,797	18.43
19	102,301	1.36	64	79,308	20.20
20	102,162	1.39	65	77,706	22.15
21	102,020	1.42	66	75,985	24.10
22	101,875	1.43	67	74,154	26.12
23	101,729	1.44	68	72,217	28.01
24	101,583	1.46	69	70,194	30.09
25	101,435	1.47	70	68,082	32.29
26	101,286	1.49	71	65,884	35.04
27	101,135	1.52	72	63,575	38.36
28	100,981	1.54	73	61,136	42.33
29	100,825	1.60	74	58,548	46.89
30	100,664	1.66	75	55,803	51.94
31	100,497	1.72	76	52,905	57.33
32	100,324	1.80	77	49,872	62.93
33	100,143	1.87	78	46,734	68.70
34	99,956	1.98	79	43,523	74.83
35	99,758	2.08	80	40,266	81.61
36	99,551	2.23	81	36,980	89.22
37	99,329	2.44	82	33,681	97.92
38	99,087	2.65	83	30,383	107.82
39	98,824	2.90	84	27,107	119.31
40	98,537	3.19	85	23,873	130.86
41	98,223	3.53	86	20,749	143.85
42	97,876	3.86	87	17,764	156.39
43	97,498	4.21	88	14,986	170.57
44	97,088	4.56	89	12,430	184.17
45	96,645	4.94	90	10,141	199.71
46	96,168	5.33	91	8,116	216.27
47	95,655	5.74	92	6,361	234.41
48	95,106	6.16	93	4,870	255.00
49	94,520	6.62	94	3,628	280.66†
50	93,894	7.14	95	2,610	318.37†
51	93,224	7.68	96	1,779	376.21†
52	92,508	8.29	97	1,110	475.72†
53	91,741	9.00	98	582	656.09†
54	90,915	9.74	99	200	1,000.00
55	90,029	10.52			
56	89,082	11.33			
57	88,073	12.11			
58	87,006	12.87			
59	85,886	13.66			

* Age nearest birthday
† Adjusted; see text
CSO: Sum q_x = 6,213.60 Sum l_x = 6,040,029

1980 CET-SF Smoker Table*
Pivotal Age Is 45
Ratio of Male l_x to Total Is 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	1,629,026	1.83	60	1,258,542	18.89
16	1,626,045	1.92	61	1,234,768	20.27
17	1,622,923	2.00	62	1,209,739	21.89
18	1,619,677	2.06	63	1,183,258	23.96
19	1,616,340	2.11	64	1,154,907	26.26
20	1,612,930	2.14	65	1,124,579	28.80
21	1,609,478	2.17	66	1,092,191	31.33
22	1,605,985	2.18	67	1,057,973	33.96
23	1,602,484	2.19	68	1,022,044	36.41
24	1,598,975	2.21	69	984,831	39.12
25	1,595,441	2.22	70	946,304	41.98
26	1,591,899	2.24	71	906,578	45.55
27	1,588,333	2.27	72	865,283	49.87
28	1,584,727	2.29	73	822,131	55.03
29	1,581,098	2.35	74	776,889	60.96
30	1,577,382	2.41	75	729,530	67.52
31	1,573,581	2.47	76	680,272	74.53
32	1,569,694	2.55	77	629,571	81.81
33	1,565,691	2.62	78	578,066	89.31
34	1,561,589	2.73	79	526,439	97.28
35	1,557,326	2.83	80	475,227	106.09
36	1,552,919	2.98	81	424,810	115.99
37	1,548,291	3.19	82	375,536	127.30
38	1,543,352	3.45	83	327,730	140.17
39	1,538,027	3.77	84	281,792	155.10
40	1,532,229	4.15	85	238,086	170.12
41	1,525,870	4.59	86	197,583	187.01
42	1,518,866	5.02	87	160,633	203.31
43	1,511,241	5.47	88	127,975	221.74
44	1,502,975	5.93	89	99,598	239.42
45	1,494,062	6.42	90	75,752	259.62
46	1,484,470	6.93	91	56,085	281.15
47	1,474,183	7.46	92	40,317	304.73
48	1,463,186	8.01	93	28,031	331.50
49	1,451,466	8.61	94	18,739	364.86
50	1,438,969	9.28	95	11,902	413.88
51	1,425,615	9.98	96	6,976	489.07
52	1,411,387	10.78	97	3,564	618.44
53	1,396,172	11.70	98	1,360	852.92
54	1,379,837	12.66	99	200	1,000.00
55	1,362,368	13.68			
56	1,343,731	14.73			
57	1,323,938	15.74			
58	1,303,099	16.73			
59	1,281,298	17.76			

* Age nearest birthday
CET: Sum q_x = 7,783.96 Sum l_x = 90,033,966

APPENDIX B

1980 CSO-NB Nonsmoker Table*
Pivotal Age Is 45
Ratio of Male l_x to Total Is 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	116,700	1.20	60	100,990	11.80
16	116,560	1.32	61	99,798	12.96
17	116,406	1.42	62	98,505	14.30
18	116,241	1.47	63	97,096	15.86
19	116,070	1.52	64	95,556	17.62
20	115,894	1.55	65	93,872	19.55
21	115,714	1.55	66	92,037	21.64
22	115,535	1.52	67	90,045	23.87
23	115,359	1.50	68	87,896	26.24
24	115,186	1.47	69	85,590	28.82
25	115,017	1.44	70	83,123	31.74
26	114,851	1.41	71	80,485	35.51
27	114,689	1.40	72	77,627	38.89
28	114,528	1.38	73	74,608	43.37
29	114,370	1.40	74	71,372	48.39
30	114,210	1.40	75	67,918	53.84
31	114,050	1.43	76	64,261	59.65
32	113,887	1.46	77	60,428	65.77
33	113,721	1.50	78	56,454	72.13
34	113,550	1.58	79	52,382	78.92
35	113,371	1.64	80	48,248	86.40
36	113,185	1.73	81	44,079	94.77
37	112,989	1.83	82	39,902	104.26
38	112,782	1.96	83	35,742	115.02
39	112,561	2.10	84	31,631	126.80
40	112,325	2.25	85	27,620	139.45
41	112,072	2.43	86	23,768	152.61
42	111,800	2.60	87	20,141	166.38
43	111,509	2.81	88	16,790	180.45
44	111,196	3.01	89	13,760	195.03
45	110,861	3.26	90	11,076	210.29
46	110,500	3.51	91	8,747	226.51†
47	110,112	3.78	92	6,766	244.13†
48	109,696	4.09	93	5,114	264.04†
49	109,247	4.41	94	3,764	289.36†
50	108,765	4.76	95	2,675	324.89†
51	108,247	5.18	96	1,806	380.97†
52	107,686	5.65	97	1,118	477.69†
53	107,078	6.19	98	584	657.38†
54	106,415	6.81	99	200	1,000.00
55	105,690	7.48			
56	104,899	8.21			
57	104,038	9.00			
58	103,102	9.84			
59	102,087	10.75			

* Age nearest birthday

† Adjusted; see text

CSO: Sum q_x = 6,301.50 Sum l_x = 7,008,325

1980 CET-NB NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	1,977,580	1.95	60	1,626,420	15.34
16	1,973,724	2.07	61	1,601,471	16.85
17	1,969,638	2.17	62	1,574,486	18.59
18	1,965,364	2.22	63	1,545,216	20.62
19	1,961,001	2.27	64	1,513,354	22.91
20	1,956,550	2.30	65	1,478,683	25.42
21	1,952,050	2.30	66	1,441,095	28.13
22	1,947,560	2.27	67	1,400,557	31.03
23	1,943,139	2.25	68	1,357,098	34.11
24	1,938,767	2.22	69	1,310,807	37.47
25	1,934,463	2.19	70	1,261,691	41.26
26	1,930,227	2.16	71	1,209,634	46.16
27	1,926,058	2.15	72	1,153,797	50.56
28	1,921,917	2.13	73	1,095,461	56.38
29	1,917,823	2.15	74	1,033,699	62.91
30	1,913,700	2.15	75	968,669	69.99
31	1,909,586	2.18	76	900,872	77.55
32	1,905,423	2.21	77	831,009	85.50
33	1,901,212	2.25	78	759,958	93.77
34	1,896,934	2.33	79	688,697	102.60
35	1,892,514	2.39	80	618,037	112.32
36	1,887,991	2.48	81	548,619	123.20
37	1,883,309	2.58	82	481,029	135.54
38	1,878,450	2.71	83	415,830	149.53
39	1,873,359	2.85	84	353,651	164.84
40	1,868,020	3.00	85	295,355	181.29
41	1,862,416	3.18	86	241,810	198.39
42	1,856,494	3.38	87	193,837	216.29
43	1,850,219	3.65	88	151,912	234.59
44	1,843,466	3.91	89	116,275	253.54
45	1,836,258	4.24	90	86,795	273.38
46	1,828,472	4.56	91	63,067	294.46
47	1,820,134	4.91	92	44,496	317.37
48	1,811,197	5.32	93	30,374	343.25
49	1,801,561	5.73	94	19,948	376.17
50	1,791,238	6.19	95	12,444	422.36
51	1,780,150	6.73	96	7,188	495.26
52	1,768,170	7.35	97	3,628	621.00
53	1,755,174	8.05	98	1,375	854.59
54	1,741,045	8.85	99	200	1,000.00
55	1,725,637	9.72			
56	1,708,864	10.67			
57	1,690,630	11.70			
58	1,670,850	12.79			
59	1,649,480	13.98			

* Age nearest birthday
CET: Sum q_x = 7,899.36 Sum l_x = 112,256,358

CSO-NC NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	95,229	1.11	60	82,926	10.97
16	95,123	1.22	61	82,016	12.01
17	95,007	1.29	62	81,031	13.21
18	94,884	1.34	63	79,961	14.62
19	94,757	1.39	64	78,792	16.24
20	94,625	1.41	65	77,512	18.01
21	94,492	1.42	66	76,116	19.91
22	94,358	1.40	67	74,601	21.94
23	94,226	1.39	68	72,964	24.05
24	94,095	1.37	69	71,209	26.35
25	93,966	1.35	70	69,333	28.95
26	93,839	1.33	71	67,326	32.26
27	93,714	1.33	72	65,154	35.42
28	93,589	1.33	73	62,846	39.52
29	93,465	1.35	74	60,362	44.17
30	93,339	1.36	75	57,696	49.24
31	93,212	1.39	76	54,855	54.70
32	93,082	1.42	77	51,854	60.43
33	92,950	1.47	78	48,720	66.46
34	92,813	1.53	79	45,482	72.92
35	92,671	1.60	80	42,165	80.06
36	92,523	1.68	81	38,789	88.10
37	92,368	1.80	82	35,372	97.27
38	92,202	1.91	83	31,931	107.73
39	92,026	2.06	84	28,491	119.23
40	91,836	2.21	85	25,094	131.61
41	91,633	2.38	86	21,791	144.68
42	91,415	2.57	87	18,638	158.40
43	91,180	2.76	88	15,686	172.60
44	90,928	2.96	89	12,979	187.46
45	90,659	3.19	90	10,546	203.08†
46	90,370	3.43	91	8,404	219.76†
47	90,060	3.69	92	6,557	238.20†
48	89,728	3.98	93	4,995	259.26†
49	89,371	4.28	94	3,700	285.17†
50	88,988	4.62	95	2,645	322.03†
51	88,577	5.00	96	1,793	378.56†
52	88,134	5.46	97	1,114	476.70†
53	87,653	5.96	98	583	657.10†
54	87,131	6.52	99	200	1,000.00
55	86,563	7.14			
56	85,945	7.80			
57	85,275	8.51			
58	84,549	9.24			
59	83,768	10.05			

* Age nearest birthday
† Adjusted; see text
CSO: Sum q_x = 6,126.38 Sum l_x = 5,788,547

1980 CET-NC NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	1,495,453	1.86	60	1,239,148	14.26
16	1,492,671	1.97	61	1,221,478	15.61
17	1,489,730	2.04	62	1,202,411	17.17
18	1,486,691	2.09	63	1,181,766	19.01
19	1,483,584	2.14	64	1,159,301	21.11
20	1,480,409	2.16	65	1,134,828	23.41
21	1,477,211	2.17	66	1,108,262	25.88
22	1,474,005	2.15	67	1,079,580	28.52
23	1,470,836	2.14	68	1,048,790	31.27
24	1,467,688	2.12	69	1,015,994	34.26
25	1,464,577	2.10	70	981,186	37.64
26	1,461,501	2.08	71	944,254	41.94
27	1,458,461	2.08	72	904,652	46.05
28	1,455,427	2.08	73	862,993	51.38
29	1,452,400	2.10	74	818,652	57.42
30	1,449,350	2.11	75	771,645	64.01
31	1,446,292	2.14	76	722,252	71.11
32	1,443,197	2.17	77	670,893	78.56
33	1,440,065	2.22	78	618,188	86.40
34	1,436,868	2.28	79	564,777	94.80
35	1,433,592	2.35	80	511,236	104.08
36	1,430,223	2.43	81	458,027	114.53
37	1,426,748	2.55	82	405,569	126.45
38	1,423,110	2.66	83	354,285	140.05
39	1,419,325	2.81	84	304,667	155.00
40	1,415,337	2.96	85	257,444	171.09
41	1,411,148	3.13	86	213,398	188.08
42	1,406,731	3.34	87	173,262	205.92
43	1,402,033	3.59	88	137,584	224.38
44	1,397,000	3.85	89	106,713	243.70
45	1,391,622	4.15	90	80,707	264.00
46	1,385,847	4.46	91	59,400	285.69
47	1,379,666	4.80	92	42,430	309.66
48	1,373,044	5.17	93	29,291	337.04
49	1,365,945	5.56	94	19,419	370.72
50	1,358,350	6.01	95	12,220	418.64
51	1,350,186	6.50	96	7,104	492.13
52	1,341,410	7.10	97	3,608	619.71
53	1,331,886	7.75	98	1,372	854.23
54	1,321,564	8.48	99	200	1,000.00
55	1,310,357	9.28			
56	1,298,197	10.14			
57	1,285,033	11.06			
58	1,270,821	12.01			
59	1,255,558	13.07			

* Age nearest birthday

CET: Sum q_x = 7,672.32 Sum l_x = 85,940,135

1980 CSO-ND NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	87,164	1.07	60	76,137	10.55
16	87,071	1.16	61	75,334	11.53
17	86,970	1.23	62	74,465	12.66
18	86,863	1.27	63	73,522	14.01
19	86,753	1.32	64	72,492	15.56
20	86,638	1.35	65	71,364	17.24
21	86,521	1.34	66	70,134	19.07
22	86,405	1.34	67	68,797	20.98
23	86,289	1.33	68	67,354	22.99
24	86,174	1.33	69	65,806	25.15
25	86,059	1.30	70	64,151	27.60
26	85,947	1.30	71	62,380	30.69
27	85,835	1.29	72	60,466	33.75
28	85,724	1.31	73	58,425	37.67
29	85,612	1.33	74	56,224	42.16
30	85,498	1.34	75	53,854	47.06
31	85,383	1.37	76	51,320	52.38
32	85,266	1.40	77	48,632	57.96
33	85,147	1.45	78	45,813	63.84
34	85,024	1.51	79	42,888	70.16
35	84,896	1.58	80	39,879	77.18
36	84,762	1.67	81	36,801	85.11
37	84,620	1.77	82	33,669	94.17
38	84,470	1.90	83	30,498	104.54
39	84,310	2.03	84	27,310	115.93
40	84,139	2.19	85	24,144	128.27
41	83,955	2.36	86	21,047	141.31
42	83,757	2.55	87	18,073	155.09
43	83,543	2.73	88	15,270	169.35
44	83,315	2.93	89	12,684	184.40
45	83,071	3.16	90	10,345	200.23†
46	82,808	3.39	91	8,274	217.23†
47	82,527	3.65	92	6,477	235.91†
48	82,226	3.92	93	4,949	257.43†
49	81,904	4.22	94	3,675	283.81†
50	81,558	4.55	95	2,632	320.74†
51	81,187	4.92	96	1,788	377.93†
52	80,788	5.36	97	1,112	476.61†
53	80,355	5.85	98	582	656.44†
54	79,885	6.38	99	200	1,000.00
55	79,375	6.97			
56	78,822	7.60			
57	78,223	8.26			
58	77,577	8.95			
59	76,883	9.70			

* Age nearest birthday

† Adjusted; see text

CSO: Sum q_x = 6,049.62 Sum l_x = 5,330,266

1980 CET-ND NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	1,321,831	1.82	60	1,099,327	13.72
16	1,319,425	1.91	61	1,084,244	14.99
17	1,316,905	1.98	62	1,067,991	16.46
18	1,314,298	2.02	63	1,050,412	18.21
19	1,311,643	2.07	64	1,031,284	20.23
20	1,308,928	2.10	65	1,010,421	22.41
21	1,306,179	2.09	66	987,777	24.79
22	1,303,449	2.09	67	963,290	27.27
23	1,300,725	2.08	68	937,021	29.89
24	1,298,019	2.08	69	909,013	32.70
25	1,295,319	2.05	70	879,288	35.88
26	1,292,664	2.05	71	847,739	39.90
27	1,290,014	2.04	72	813,914	43.88
28	1,287,382	2.06	73	778,199	48.97
29	1,284,730	2.08	74	740,091	54.81
30	1,282,058	2.09	75	699,527	61.18
31	1,279,378	2.12	76	656,730	68.09
32	1,276,666	2.15	77	612,013	75.35
33	1,273,921	2.20	78	565,898	82.99
34	1,271,118	2.26	79	518,934	91.21
35	1,268,245	2.33	80	471,602	100.33
36	1,265,290	2.42	81	424,286	110.64
37	1,262,228	2.52	82	377,343	122.42
38	1,259,047	2.65	83	331,149	135.90
39	1,255,711	2.78	84	286,146	150.71
40	1,252,220	2.94	85	243,021	166.75
41	1,248,538	3.11	86	202,497	183.70
42	1,244,655	3.32	87	165,298	201.62
43	1,240,523	3.55	88	131,971	220.16
44	1,236,119	3.81	89	102,916	239.72
45	1,231,409	4.11	90	78,245	260.30
46	1,226,348	4.41	91	57,878	282.40
47	1,220,940	4.75	92	41,533	306.68
48	1,215,141	5.10	93	28,796	334.66
49	1,208,944	5.49	94	19,159	368.95
50	1,202,307	5.92	95	12,090	416.96
51	1,195,189	6.40	96	7,049	491.31
52	1,187,540	6.97	97	3,586	619.59
53	1,179,263	7.61	98	1,364	853.37
54	1,170,289	8.29	99	200	1,000.00
55	1,160,587	9.06			
56	1,150,072	9.88			
57	1,138,709	10.74			
58	1,126,479	11.64			
59	1,113,367	12.61			

* Age nearest birthday

CET: Sum q_x = 7,572.85 Sum l_x = 76,433,054

1980 CSO-NE NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	80,445	1.03	60	70,486	10.14
16	80,362	1.10	61	69,771	11.04
17	80,274	1.17	62	69,001	12.12
18	80,180	1.21	63	68,165	13.40
19	80,083	1.25	64	67,252	14.89
20	79,983	1.29	65	66,251	16.49
21	79,880	1.28	66	65,159	18.23
22	79,778	1.28	67	63,971	20.04
23	79,676	1.28	68	62,689	21.93
24	79,574	1.28	69	61,314	23.96
25	79,472	1.26	70	59,845	26.28
26	79,372	1.26	71	58,272	29.16
27	79,272	1.27	72	56,573	32.11
28	79,171	1.28	73	54,756	35.90
29	79,070	1.30	74	52,790	40.21
30	78,967	1.31	75	50,667	44.98
31	78,864	1.36	76	48,388	50.15
32	78,757	1.39	77	45,961	55.59
33	78,648	1.42	78	43,406	61.36
34	78,536	1.49	79	40,743	67.55
35	78,419	1.56	80	37,991	74.48
36	78,297	1.65	81	35,161	82.32
37	78,168	1.76	82	32,267	91.29
38	78,030	1.87	83	29,321	101.59
39	77,884	2.02	84	26,342	112.91
40	77,727	2.16	85	23,368	125.24
41	77,559	2.34	86	20,441	138.25
42	77,378	2.53	87	17,615	152.08
43	77,182	2.72	88	14,936	166.50
44	76,972	2.91	89	12,449	181.73
45	76,748	3.13	90	10,187	197.78†
46	76,508	3.35	91	8,172	215.12†
47	76,252	3.59	92	6,414	234.03†
48	75,978	3.87	93	4,913	255.85†
49	75,684	4.15	94	3,656	282.58†
50	75,370	4.48	95	2,623	319.76†
51	75,032	4.84	96	1,784	377.41†
52	74,669	5.25	97	1,111	476.21†
53	74,277	5.73	98	582	656.10†
54	73,851	6.23	99	200	1,000.00
55	73,391	6.81			
56	72,891	7.39			
57	72,352	8.02			
58	71,772	8.65			
59	71,151	9.35			

* Age nearest birthday

† Adjusted; see text

CSO: Sum q_x = 5,978.63 Sum l_x = 4,948,899

1980 CET-NE NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	1,182,241	1.78	60	986,910	13.18
16	1,180,137	1.85	61	973,903	14.35
17	1,177,954	1.92	62	959,927	15.76
18	1,175,692	1.96	63	944,799	17.42
19	1,173,388	2.00	64	928,341	19.36
20	1,171,041	2.04	65	910,368	21.44
21	1,168,652	2.03	66	890,850	23.70
22	1,166,280	2.03	67	869,737	26.05
23	1,163,912	2.03	68	847,080	28.51
24	1,161,549	2.03	69	822,930	31.15
25	1,159,191	2.01	70	797,296	34.16
26	1,156,861	2.01	71	770,060	37.91
27	1,154,536	2.02	72	740,867	41.74
28	1,152,204	2.03	73	709,943	46.67
29	1,149,865	2.05	74	676,810	52.27
30	1,147,508	2.06	75	641,433	58.47
31	1,145,144	2.11	76	603,928	65.20
32	1,142,728	2.14	77	564,552	72.27
33	1,140,283	2.17	78	523,752	79.77
34	1,137,809	2.24	79	481,972	87.82
35	1,135,260	2.31	80	439,645	96.82
36	1,132,638	2.40	81	397,079	107.02
37	1,129,920	2.51	82	354,584	118.68
38	1,127,084	2.62	83	312,502	132.07
39	1,124,131	2.77	84	271,230	146.78
40	1,121,017	2.91	85	231,419	162.81
41	1,117,755	3.09	86	193,742	179.73
42	1,114,301	3.29	87	158,921	197.70
43	1,110,635	3.54	88	127,502	216.45
44	1,106,703	3.78	89	99,904	236.25
45	1,102,520	4.07	90	76,302	257.11
46	1,098,033	4.36	91	56,684	279.66
47	1,093,246	4.67	92	40,832	304.24
48	1,088,141	5.03	93	28,409	332.61
49	1,082,668	5.40	94	18,960	367.35
50	1,076,822	5.82	95	11,995	415.69
51	1,070,555	6.29	96	7,009	490.63
52	1,063,821	6.83	97	3,570	619.07
53	1,056,555	7.45	98	1,360	852.93
54	1,048,684	8.10	99	200	1,000.00
55	1,040,190	8.85			
56	1,030,984	9.61			
57	1,021,076	10.43			
58	1,010,426	11.25			
59	999,059	12.16			

* Age nearest birthday

CET: Sum q_x = 7,480.85 Sum l_x = 68,786,506

1980 CSO-NF Nonsmoker Table*
Pivotal Age Is 45
Ratio of Male l_x to Total Is 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	69,713	0.94	60	61,464	9.32
16	69,647	0.99	61	60,891	10.11
17	69,578	1.04	62	60,275	11.04
18	69,506	1.07	63	59,610	12.20
19	69,432	1.12	64	58,883	13.55
20	69,354	1.15	65	58,085	15.01
21	69,274	1.14	66	57,213	16.58
22	69,195	1.16	67	56,264	18.21
23	69,115	1.16	68	55,239	19.86
24	69,035	1.18	69	54,142	21.65
25	68,954	1.17	70	52,970	23.69
26	68,873	1.19	71	51,715	26.19
27	68,791	1.20	72	50,361	28.98
28	68,708	1.23	73	48,902	32.47
29	68,623	1.25	74	47,314	36.50
30	68,537	1.28	75	45,587	41.02
31	68,449	1.32	76	43,717	45.94
32	68,359	1.35	77	41,709	51.16
33	68,267	1.38	78	39,575	56.73
34	68,173	1.45	79	37,330	62.78
35	68,074	1.51	80	34,986	69.53
36	67,971	1.61	81	32,553	77.24
37	67,862	1.71	82	30,039	86.13
38	67,746	1.84	83	27,452	96.33
39	67,621	1.97	84	24,808	107.59
40	67,488	2.12	85	22,139	119.91
41	67,345	2.30	86	19,484	132.99
42	67,190	2.49	87	16,893	146.95
43	67,023	2.67	88	14,411	161.59
44	66,844	2.85	89	12,082	177.21
45	66,653	3.06	90	9,941	193.74
46	66,449	3.27	91	8,015	211.49
47	66,232	3.50	92	6,320	231.05†
48	66,000	3.76ˑ	93	4,860	253.44†
49	65,752	4.02	94	3,628	280.66†
50	65,488	4.33	95	2,610	318.37†
51	65,204	4.67	96	1,779	376.21†
52	64,899	5.05	97	1,110	475.72†
53	64,571	5.49	98	582	656.09†
54	64,217	5.96	99	200	1,000.00
55	63,834	6.46			
56	63,422	6.99			
57	62,979	7.54			
58	62,504	8.06			
59	62,000	8.65			

* Age nearest birthday
† Adjusted; see text
CSO: Sum q_x = 5,850.88 Sum l_x = 4,340,089

1980 CET-NF NONSMOKER TABLE*
PIVOTAL AGE IS 45
RATIO OF MALE l_x TO TOTAL IS 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
15	974,349	1.69	60	819,503	12.12
16	972,702	1.74	61	809,571	13.14
17	971,009	1.79	62	798,933	14.35
18	969,271	1.82	63	787,468	15.86
19	967,507	1.87	64	774,979	17.62
20	965,698	1.90	65	761,324	19.51
21	963,863	1.89	66	746,471	21.55
22	962,041	1.91	67	730,385	23.67
23	960,204	1.91	68	713,097	25.82
24	958,370	1.93	69	694,685	28.15
25	956,520	1.92	70	675,130	30.80
26	954,683	1.94	71	654,336	34.05
27	952,831	1.95	72	632,056	37.67
28	950,973	1.98	73	608,246	42.21
29	949,090	2.00	74	582,572	47.45
30	947,192	2.03	75	554,929	53.33
31	945,269	2.07	76	525,335	59.72
32	943,312	2.10	77	493,962	66.51
33	941,331	2.13	78	461,109	73.75
34	939,326	2.20	79	427,102	81.61
35	937,259	2.26	80	392,246	90.39
36	935,141	2.36	81	356,791	100.41
37	932,934	2.46	82	320,966	111.97
38	930,639	2.59	83	285,027	125.23
39	928,229	2.72	84	249,333	139.87
40	925,704	2.87	85	214,459	155.88
41	923,047	3.05	86	181,029	172.89
42	920,232	3.24	87	149,731	191.04
43	917,250	3.47	88	121,126	210.07
44	914,067	3.71	89	95,681	230.37
45	910,676	3.98	90	73,639	251.86
46	907,052	4.25	91	55,092	274.94
47	903,197	4.55	92	39,945	300.37
48	899,087	4.89	93	27,947	329.47
49	894,690	5.23	94	18,739	364.86
50	890,011	5.63	95	11,902	413.88
51	885,000	6.07	96	6,976	489.07
52	879,628	6.57	97	3,564	618.44
53	873,849	7.14	98	1,360	852.92
54	867,610	7.75	99	200	1,000.00
55	860,886	8.40			
56	853,655	9.09			
57	845,895	9.80			
58	837,605	10.48			
59	828,827	11.25			

* Age nearest birthday

CET: Sum q_x = 7,315.40 Sum l_x = 57,404,657

BLENDED 1983 a-B—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.343	45	9,729.7926	2.156	85	4,213.1047	84.534
6	9,996.5700	0.314	46	9,708.8152	2.414	86	3,856.9541	92.493
7	9,993.4311	0.296	47	9,685.3781	2.693	87	3,500.2128	100.907
8	9,990.4730	0.311	48	9,659.2954	2.990	88	3,147.0168	109.767
9	9,987.3660	0.324	49	9,630.4141	3.304	89	2,801.5782	119.098
10	9,984.1301	0.337	50	9,598.5952	3.630	90	2,467.9158	128.926
11	9,980.7654	0.347	51	9,563.7523	3.967	91	2,149.7373	139.274
12	9,977.3021	0.358	52	9,525.8129	4.312	92	1,850.3348	150.155
13	9,973.7302	0.368	53	9,484.7376	4.663	93	1,572.4978	161.581
14	9,970.0599	0.378	54	9,440.5103	5.022	94	1,318.4120	173.554
15	9,966.2912	0.388	55	9,393.1001	5.393	95	1,089.5963	186.075
16	9,962.4243	0.400	56	9,342.4431	5.776	96	886.84967	199.139
17	9,958.4393	0.412	57	9,288.4811	6.175	97	710.24331	212.737
18	9,954.3364	0.426	58	9,231.1247	6.596	98	559.14828	227.235
19	9,950.0959	0.442	59	9,170.2362	7.057	99	432.09022	242.998
20	9,945.6980	0.459	60	9,105.5218	7.577	100	327.09316	260.387
21	9,941.1329	0.478	61	9,036.5293	8.180	101	241.92235	279.766
22	9,936.3810	0.498	62	8,962.6105	8.884	102	174.24070	301.497
23	9,931.4327	0.521	63	8,882.9867	9.709	103	121.70765	325.952
24	9,926.2584	0.546	64	8,796.7418	10.662	104	82.036798	353.511
25	9,920.8387	0.570	65	8,702.9509	11.748	105	53.035888	384.573
26	9,915.1838	0.597	66	8,600.7086	12.972	106	32.639717	419.558
27	9,909.2644	0.622	67	8,489.1402	14.338	107	18.945463	458.918
28	9,903.1008	0.647	68	8,367.4229	15.854	108	10.251049	503.143
29	9,896.6935	0.673	69	8,234.7658	17.531	109	5.0933055	552.767
30	9,890.0330	0.699	70	8,090.4021	19.381	110	2.2778943	608.373
31	9,883.1199	0.724	71	7,933.6020	21.420	111	0.89208491	670.599
32	9,875.9645	0.751	72	7,763.6642	23.661	112	0.29385366	740.128
33	9,868.5477	0.778	73	7,579.9681	26.121	113	0.076364338	817.694
34	9,860.8700	0.809	74	7,381.9718	28.832	114	0.013921677	904.058
35	9,852.8926	0.846	75	7,169.1348	31.828	115	0.0013356735	1,000.000
36	9,844.5571	0.893	76	6,940.9556	35.143			
37	9,835.7659	0.951	77	6,697.0296	38.810			
38	9,826.4121	1.025	78	6,437.1179	42.863			
39	9,816.3400	1.116	79	6,161.2037	47.335			
40	9,805.3850	1.227	80	5,869.5631	52.258			
41	9,793.3538	1.361	81	5,562.8315	57.665			
42	9,780.0250	1.520	82	5,242.0508	63.591			
43	9,765.1594	1.706	83	4,908.7035	70.057			
44	9,748.5000	1.919	84	4,564.8145	77.048			

q_x SUM = 11,756.393; l_x SUM = 755,879.4193150585

BLENDED 1983 *a*-C—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.307	45	9,756.7361	1.907	85	4,560.8764	78.887
6	9,996.9300	0.277	46	9,738.1300	2.129	86	4,201.0825	86.770
7	9,994.1609	0.257	47	9,717.3975	2.371	87	3,836.5546	95.226
8	9,991.5924	0.269	48	9,694.3576	2.630	88	3,471.2149	104.265
9	9,988.9047	0.279	49	9,668.8614	2.906	89	3,109.2887	113.880
10	9,986.1178	0.290	50	9,640.7637	3.194	90	2,755.2029	124.050
11	9,983.2218	0.300	51	9,609.9711	3.494	91	2,413.4200	134.750
12	9,980.2268	0.309	52	9,576.3939	3.803	92	2,088.2117	145.944
13	9,977.1429	0.319	53	9,539.9749	4.119	93	1,783.4497	157.595
14	9,973.9602	0.329	54	9,500.6797	4.444	94	1,502.3869	169.662
15	9,970.6788	0.340	55	9,458.4587	4.782	95	1,247.4889	182.104
16	9,967.2888	0.352	56	9,413.2284	5.134	96	1,020.3162	194.873
17	9,963.7803	0.365	57	9,364.9009	5.503	97	821.48412	207.918
18	9,960.1435	0.379	58	9,313.3659	5.895	98	650.68278	221.654
19	9,956.3686	0.395	59	9,258.4636	6.324	99	506.45634	236.492
20	9,952.4358	0.411	60	9,199.9131	6.810	100	386.68347	252.846
21	9,948.3453	0.430	61	9,137.2617	7.371	101	288.91210	271.129
22	9,944.0675	0.449	62	9,069.9109	8.024	102	210.57965	291.762
23	9,939.6026	0.471	63	8,997.1339	8.785	103	149.14051	315.172
24	9,934.9210	0.494	64	8,918.0941	9.658	104	102.13560	341.804
25	9,930.0131	0.517	65	8,831.9631	10.645	105	67.225243	372.124
26	9,924.8793	0.542	66	8,737.9469	11.747	106	42.209117	406.620
27	9,919.5000	0.566	67	8,635.3022	12.966	107	25.046046	445.810
28	9,913.8856	0.589	68	8,523.3369	14.306	108	13.880268	490.247
29	9,908.0463	0.613	69	8,401.4020	15.784	109	7.0755083	540.511
30	9,901.9727	0.637	70	8,268.7943	17.419	110	3.2511182	597.213
31	9,895.6651	0.661	71	8,124.7602	19.234	111	1.3095081	660.992
32	9,889.1241	0.685	72	7,968.4886	21.247	112	0.44393372	732.498
33	9,882.3500	0.711	73	7,799.1821	23.482	113	0.11875316	812.395
34	9,875.3236	0.740	74	7,616.0417	25.967	114	0.022278687	901.345
35	9,868.0159	0.774	75	7,418.2759	28.734	115	0.0021979039	1,000.00
36	9,860.3781	0.817	76	7,205.1192	31.811			
37	9,852.3222	0.869	77	6,975.9172	35.228			
38	9,843.7605	0.934	78	6,730.1696	39.015			
39	9,834.5664	1.014	79	6,467.5920	43.209			
40	9,824.5941	1.111	80	6,188.1338	47.847			
41	9,813.6790	1.226	81	5,892.0502	52.968			
42	9,801.6474	1.363	82	5,579.9601	58.612			
43	9,788.2878	1.522	83	5,252.9075	64.811			
44	9,773.3900	1.704	84	4,912.4613	71.570			

q_x SUM = 11,457.04; l_x SUM = 766,081.2447420709

BLENDED 1983 *a*-D—MORTALITY TABLE

PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.289	45	9,770.4941	1.780	85	4,738.6751	76.321
6	9,997.1100	0.259	46	9,753.1026	1.984	86	4,377.0147	84.192
7	9,994.5207	0.237	47	9,733.7524	2.206	87	4,008.5051	92.690
8	9,992.1520	0.247	48	9,712.2797	2.447	88	3,636.9568	101.831
9	9,989.6839	0.256	49	9,688.5138	2.703	89	3,266.6019	111.592
10	9,987.1265	0.266	50	9,662.3257	2.973	90	2,902.0753	121.931
11	9,984.4699	0.275	51	9,633.5996	3.254	91	2,548.2224	132.799
12	9,981.7242	0.285	52	9,602.2519	3.544	92	2,209.8210	144.142
13	9,978.8794	0.295	53	9,568.2215	3.843	93	1,891.2930	155.901
14	9,975.9356	0.305	54	9,531.4508	4.152	94	1,596.4385	168.019
15	9,972.8929	0.316	55	9,491.8762	4.473	95	1,328.2065	180.438
16	9,969.7415	0.328	56	9,449.4190	4.809	96	1,088.5476	193.097
17	9,966.4714	0.340	57	9,403.9767	5.163	97	878.35232	205.927
18	9,963.0828	0.355	58	9,355.4240	5.541	98	697.47586	219.366
19	9,959.5459	0.370	59	9,303.5856	5.955	99	544.47337	233.853
20	9,955.8609	0.387	60	9,248.1827	6.424	100	417.14664	249.823
21	9,952.0080	0.405	61	9,188.7724	6.964	101	312.93381	267.716
22	9,947.9774	0.424	62	9,124.7818	7.592	102	229.15642	287.977
23	9,943.7595	0.445	63	9,055.5065	8.321	103	163.16464	311.062
24	9,939.3345	0.468	64	8,980.1556	9.155	104	112.41032	337.437
25	9,934.6829	0.490	65	8,897.9423	10.094	105	74.478919	367.592
26	9,929.8149	0.514	66	8,808.1265	11.136	106	47.101064	402.036
27	9,924.7110	0.537	67	8,710.0392	12.282	107	28.164741	441.303
28	9,919.3814	0.560	68	8,603.0625	13.537	108	15.735556	485.952
29	9,913.8265	0.582	69	8,486.6028	14.917	109	8.0888311	536.566
30	9,908.0567	0.605	70	8,360.0081	16.449	110	3.7486394	593.747
31	9,902.0623	0.629	71	8,222.4943	18.155	111	1.5228960	658.115
32	9,895.8339	0.652	72	8,073.2149	20.060	112	0.52065530	730.296
33	9,889.3818	0.677	73	7,911.2662	22.189	113	0.14042282	810.922
34	9,882.6867	0.704	74	7,735.7231	24.570	114	0.026550866	900.618
35	9,875.7293	0.737	75	7,545.6564	27.231	115	0.0026386782	1,000.00
36	9,868.4509	0.778	76	7,340.1806	30.200			
37	9,860.7732	0.827	77	7,118.5071	33.505			
38	9,852.6183	0.888	78	6,880.0015	37.174			
39	9,843.8692	0.962	79	6,624.2443	41.247			
40	9,834.3994	1.051	80	6,351.0141	45.763			
41	9,824.0634	1.158	81	6,060.3726	50.764			
42	9,812.6871	1.283	82	5,752.7238	56.293			
43	9,800.0974	1.429	83	5,428.8857	62.386			
44	9,786.0931	1.594	84	5,090.1992	69.059			

q_x SUM = 11,336.764; l_x SUM = 771,296.4363941642

97

BLENDED 1983 a-E—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.271	45	9,784.4962	1.651	85	4,919.1554	73.906
6	9,997.2900	0.239	46	9,768.3420	1.837	86	4,555.6003	81.778
7	9,994.9006	0.217	47	9,750.3976	2.040	87	4,183.0524	90.329
8	9,992.7317	0.225	48	9,730.5068	2.262	88	3,805.2015	99.578
9	9,990.4833	0.233	49	9,708.4964	2.498	89	3,426.2871	109.485
10	9,988.1555	0.242	50	9,684.2446	2.749	90	3,051.1601	119.988
11	9,985.7384	0.250	51	9,657.6226	3.011	91	2,685.0575	131.019
12	9,983.2420	0.259	52	9,628.5435	3.284	92	2,333.2640	142.505
13	9,980.6563	0.269	53	9,596.9234	3.565	93	2,000.7622	154.368
14	9,977.9715	0.279	54	9,562.7104	3.856	94	1,691.9085	166.538
15	9,975.1876	0.291	55	9,525.8366	4.162	95	1,410.1414	178.943
16	9,972.2848	0.303	56	9,486.1901	4.483	96	1,157.8065	191.507
17	9,969.2632	0.316	57	9,443.6635	4.822	97	936.07845	204.152
18	9,966.1129	0.330	58	9,398.1262	5.185	98	744.97616	217.339
19	9,962.8241	0.346	59	9,349.3969	5.584	99	583.06379	231.526
20	9,959.3770	0.362	60	9,297.1899	6.036	100	448.06936	247.175
21	9,955.7717	0.380	61	9,241.0721	6.556	101	337.31782	264.749
22	9,951.9885	0.399	62	9,180.4876	7.158	102	248.01326	284.716
23	9,948.0177	0.419	63	9,114.7737	7.857	103	177.39992	307.554
24	9,943.8495	0.441	64	9,043.1589	8.652	104	122.83987	333.751
25	9,939.4643	0.463	65	8,964.9175	9.542	105	81.841941	363.814
26	9,934.8623	0.486	66	8,879.3743	10.525	106	52.066697	398.265
27	9,930.0340	0.508	67	8,785.9189	11.600	107	31.330354	437.645
28	9,924.9895	0.530	68	8,684.0022	12.770	108	17.618781	482.518
29	9,919.7293	0.551	69	8,573.1075	14.055	109	9.1174020	533.458
30	9,914.2635	0.573	70	8,452.6125	15.485	110	4.2536510	591.057
31	9,908.5826	0.596	71	8,321.7238	17.086	111	1.7395008	655.916
32	9,902.6771	0.618	72	8,179.5388	18.886	112	0.59853439	728.639
33	9,896.5572	0.642	73	8,025.0600	20.914	113	0.16241889	809.829
34	9,890.2036	0.669	74	7,857.2239	23.195	114	0.030887363	900.086
35	9,883.5871	0.700	75	7,674.9756	25.756	115	0.0030860800	1,000.000
36	9,876.6686	0.738	76	7,477.2989	28.625			
37	9,869.3796	0.784	77	7,263.2612	31.826			
38	9,861.6420	0.841	78	7,032.1006	35.386			
39	9,853.3484	0.909	79	6,783.2627	39.349			
40	9,844.3917	0.991	80	6,516.3481	43.754			
41	9,834.6359	1.088	81	6,231.2318	48.649			
42	9,823.9358	1.202	82	5,928.0886	54.077			
43	9,812.1274	1.334	83	5,607.5154	60.080			
44	9,799.0380	1.484	84	5,270.6159	66.683			

q_x SUM = 11,229.402; l_x SUM = 776,592.240183523

98

BLENDED 1983 a-F—MORTALITY TABLE

PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.233	45	9,813.0986	1.390	85	5,288.3653	69.479
6	9,997.6700	0.200	46	9,799.4584	1.538	86	4,920.9350	77.387
7	9,995.6705	0.176	47	9,784.3868	1.702	87	4,540.1186	86.065
8	9,993.9113	0.180	48	9,767.7338	1.885	88	4,149.3733	95.537
9	9,992.1124	0.185	49	9,749.3216	2.082	89	3,752.9546	105.732
10	9,990.2639	0.192	50	9,729.0235	2.294	90	3,356.1472	116.551
11	9,988.3458	0.199	51	9,706.7051	2.519	91	2,964.9849	127.890
12	9,986.3581	0.208	52	9,682.2539	2.754	92	2,585.7930	139.642
13	9,984.2809	0.218	53	9,655.5890	3.001	93	2,224.7077	151.702
14	9,982.1043	0.228	54	9,626.6126	3.258	94	1,887.2151	163.975
15	9,979.8284	0.240	55	9,595.2491	3.531	95	1,577.7590	176.367
16	9,977.4332	0.253	56	9,561.3683	3.822	96	1,299.4944	188.784
17	9,974.9089	0.266	57	9,524.8248	4.131	97	1,054.1706	201.128
18	9,972.2556	0.280	58	9,485.4777	4.466	98	842.14738	213.903
19	9,969.4634	0.296	59	9,443.1156	4.837	99	662.00953	227.611
20	9,966.5124	0.312	60	9,397.4392	5.255	100	511.32888	242.756
21	9,963.4028	0.329	61	9,348.0557	5.735	101	387.20073	259.843
22	9,960.1248	0.347	62	9,294.4446	6.288	102	286.58933	279.381
23	9,956.6686	0.366	63	9,236.0011	6.925	103	206.52172	301.884
24	9,953.0245	0.386	64	9,172.0418	7.643	104	144.17612	327.871
25	9,949.1826	0.407	65	9,101.9399	8.439	105	96.904951	357.873
26	9,945.1333	0.428	66	9,025.1286	9.306	106	62.225285	392.424
27	9,940.8768	0.448	67	8,941.1408	10.241	107	37.806590	432.071
28	9,936.4233	0.468	68	8,849.5746	11.245	108	21.471459	477.368
29	9,931.7731	0.488	69	8,750.0611	12.345	109	11.221672	528.875
30	9,926.9264	0.508	70	8,642.0416	13.578	110	5.2868102	587.156
31	9,921.8835	0.529	71	8,524.7000	14.977	111	2.1826279	652.778
32	9,916.6348	0.550	72	8,397.0256	16.577	112	0.75785642	726.309
33	9,911.1807	0.572	73	8,257.8281	18.414	113	0.20741848	808.315
34	9,905.5115	0.596	74	8,105.7685	20.510	114	0.039759011	899.359
35	9,899.6078	0.623	75	7,939.5192	22.889	115	0.0040013866	1,000.000
36	9,893.4403	0.657	76	7,757.7915	25.576			
37	9,886.9403	0.697	77	7,559.3782	28.590			
38	9,880.0491	0.745	78	7,343.2556	31.959			
39	9,872.6885	0.802	79	7,108.5725	35.729			
40	9,864.7706	0.868	80	6,854.5903	39.947			
41	9,856.2080	0.946	81	6,580.7700	44.664			
42	9,846.8840	1.037	82	6,286.8465	49.930			
43	9,836.6728	1.140	83	5,972.9443	55.793			
44	9,825.4590	1.258	84	5,639.6958	62.296			

q_x SUM = 11,042.938; l_x SUM = 787,423.4609203976

99

BLENDED 1983 GAM-B—MORTALITY TABLE

PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 80%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.310	45	9,770.4979	1.962	85	3,485.1281	102.003
6	9,996.9000	0.285	46	9,751.3282	2.215	86	3,129.6346	110.085
7	9,994.0509	0.268	47	9,729.7290	2.497	87	2,785.1088	118.518
8	9,991.3725	0.259	48	9,705.4339	2.803	88	2,455.0233	127.435
9	9,988.7847	0.256	49	9,678.2296	3.133	89	2,142.1674	137.090
10	9,986.2276	0.256	50	9,647.9077	3.480	90	1,848.4977	147.438
11	9,983.6711	0.262	51	9,614.3330	3.843	91	1,575.9589	158.346
12	9,981.0554	0.268	52	9,577.3851	4.220	92	1,326.4121	169.875
13	9,978.3805	0.275	53	9,536.9685	4.612	93	1,101.0878	182.120
14	9,975.6364	0.282	54	9,492.9840	5.020	94	900.55769	196.442
15	9,972.8233	0.290	55	9,445.3292	5.442	95	723.65034	212.266
16	9,969.9312	0.299	56	9,393.9277	5.883	96	570.04398	227.975
17	9,966.9502	0.309	57	9,338.6632	6.360	97	440.08820	244.960
18	9,963.8704	0.318	58	9,279.2693	6.890	98	332.28419	263.570
19	9,960.7019	0.330	59	9,215.3351	7.497	99	244.70405	284.306
20	9,957.4149	0.342	60	9,146.2477	8.198	100	175.13322	307.420
21	9,954.0095	0.356	61	9,071.2668	9.014	101	121.29377	333.173
22	9,950.4659	0.371	62	8,989.4984	9.967	102	80.881961	361.945
23	9,946.7743	0.387	63	8,899.9001	11.082	103	51.607140	394.492
24	9,942.9249	0.406	64	8,801.2714	12.381	104	31.248536	432.876
25	9,938.8881	0.424	65	8,692.3029	13.886	105	17.721795	478.696
26	9,934.6740	0.447	66	8,571.6016	15.613	106	9.2384426	533.735
27	9,930.2332	0.470	67	8,437.7732	17.546	107	4.3075624	599.847
28	9,925.5660	0.497	68	8,289.7240	19.663	108	1.7236840	678.960
29	9,920.6330	0.525	69	8,126.7232	21.942	109	0.55337151	773.070
30	9,915.4247	0.557	70	7,948.4066	24.361	110	0.12557660	1,000.000
31	9,909.9018	0.592	71	7,754.7755	26.917			
32	9,904.0351	0.631	72	7,546.0402	29.677			
33	9,897.7857	0.674	73	7,322.0964	32.721			
34	9,891.1146	0.721	74	7,082.5101	36.128			
35	9,883.9831	0.788	75	6,826.6332	39.977			
36	9,876.1945	0.831	76	6,553.7249	44.327			
37	9,867.9874	0.885	77	6,263.2179	49.169			
38	9,859.2542	0.951	78	5,955.2617	54.476			
39	9,849.8780	1.032	79	5,630.8429	60.222			
40	9,839.7129	1.130	80	5,291.7423	66.378			
41	9,828.5940	1.247	81	4,940.4870	72.914			
42	9,816.3377	1.385	82	4,580.2563	79.788			
43	9,802.7421	1.551	83	4,214.8068	86.956			
44	9,787.5380	1.741	84	3,848.3041	94.373			

q_x SUM = 9,603.384; l_x SUM = 742,559.34250911

100

BLENDED 1983 GAM-C—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 60%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.277	45	9,794.1801	1.734	85	3,923.7570	91.654
6	9,997.2300	0.250	46	9,777.1970	1.953	86	3,564.1290	99.016
7	9,994.7307	0.232	47	9,758.1021	2.195	87	3,211.2232	106.789
8	9,992.4119	0.222	48	9,736.6831	2.458	88	2,868.2999	115.109
9	9,990.1936	0.218	49	9,712.7503	2.742	89	2,538.1328	124.358
10	9,988.0157	0.218	50	9,686.1179	3.039	90	2,222.4957	134.389
11	9,985.8383	0.224	51	9,656.6818	3.349	91	1,923.8167	145.112
12	9,983.6015	0.231	52	9,624.3416	3.673	92	1,644.6478	156.695
13	9,981.2953	0.239	53	9,588.9914	4.010	93	1,386.9397	169.282
14	9,978.9098	0.246	54	9,550.5395	4.365	94	1,152.1558	183.785
15	9,976.4550	0.255	55	9,508.8514	4.739	95	940.40685	199.936
16	9,973.9110	0.263	56	9,463.7890	5.135	96	752.38567	216.907
17	9,971.2879	0.273	57	9,415.1924	5.567	97	589.18795	235.099
18	9,968.5657	0.283	58	9,362.7780	6.049	98	450.67045	254.961
19	9,965.7446	0.294	59	9,306.1426	6.597	99	335.76706	277.146
20	9,962.8147	0.305	60	9,244.7500	7.227	100	242.71056	301.919
21	9,959.7760	0.319	61	9,177.9382	7.952	101	169.43163	329.565
22	9,956.5988	0.333	62	9,104.9552	8.792	102	113.59289	360.552
23	9,953.2833	0.348	63	9,024.9044	9.765	103	72.636746	395.111
24	9,949.8196	0.366	64	8,936.7762	10.889	104	43.937169	435.385
25	9,946.1780	0.384	65	8,839.4636	12.181	105	24.807585	482.847
26	9,942.3587	0.404	66	8,731.7901	13.654	106	12.829317	539.212
27	9,938.3420	0.426	67	8,612.5662	15.305	107	5.9115953	606.272
28	9,934.1083	0.451	68	8,480.7509	17.128	108	2.3275606	685.890
29	9,929.6280	0.476	69	8,335.4926	19.117	109	0.73111006	780.005
30	9,924.9015	0.506	70	8,176.1430	21.265	110	0.16084056	1,000.000
31	9,919.8795	0.538	71	8,002.2773	23.581			
32	9,914.5426	0.573	72	7,813.5756	26.116			
33	9,908.8616	0.612	73	7,609.5163	28.931			
34	9,902.7974	0.655	74	7,389.3654	32.084			
35	9,896.3111	0.714	75	7,152.2850	35.629			
36	9,889.2451	0.753	76	6,897.4562	39.608			
37	9,881.7985	0.802	77	6,624.2618	44.011			
38	9,873.8733	0.861	78	6,332.7214	48.816			
39	9,865.3719	0.933	79	6,023.5833	54.001			
40	9,856.1675	1.019	80	5,698.3038	59.542			
41	9,846.1241	1.120	81	5,359.0154	65.416			
42	9,835.0964	1.240	82	5,008.4500	71.591			
43	9,822.9009	1.381	83	4,649.8901	78.040			
44	9,809.3355	1.545	84	4,287.0127	84.734			

q_x SUM = 9,340.765; l_x SUM = 755,016.98078352

BLENDED 1983 GAM-D—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 50%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.260	45	9,806.3214	1.618	85	4,148.6849	87.195
6	9,997.4000	0.233	46	9,790.4548	1.818	86	3,786.9403	94.324
7	9,995.0706	0.214	47	9,772.6558	2.041	87	3,429.7409	101.905
8	9,992.9317	0.203	48	9,752.7098	2.282	88	3,080.2332	110.072
9	9,990.9031	0.199	49	9,730.4541	2.543	89	2,741.1858	119.255
10	9,988.9149	0.199	50	9,705.7096	2.815	90	2,414.2857	129.265
11	9,986.9271	0.205	51	9,678.3880	3.098	91	2,102.2031	140.025
12	9,984.8798	0.213	52	9,648.4044	3.394	92	1,807.8421	151.736
13	9,982.7530	0.220	53	9,615.6577	3.704	93	1,533.5274	164.555
14	9,980.5568	0.228	54	9,580.0413	4.033	94	1,281.1778	179.223
15	9,978.2812	0.236	55	9,541.4050	4.382	95	1,051.5613	195.585
16	9,975.9263	0.245	56	9,499.5946	4.756	96	845.89168	213.083
17	9,973.4822	0.255	57	9,454.4145	5.165	97	665.64654	231.756
18	9,970.9390	0.264	58	9,405.5824	5.623	98	511.37896	252.092
19	9,968.3067	0.276	59	9,352.6948	6.143	99	382.46442	274.797
20	9,965.5554	0.287	60	9,295.2412	6.737	100	277.36434	300.138
21	9,962.6953	0.300	61	9,232.6192	7.418	101	194.11676	328.408
22	9,959.7065	0.314	62	9,164.1316	8.201	102	130.36726	360.109
23	9,956.5792	0.329	63	9,088.9766	9.104	103	83.420836	395.307
24	9,953.3035	0.346	64	9,006.2306	10.141	104	50.443996	436.182
25	9,949.8597	0.363	65	8,914.8984	11.328	105	28.441233	484.173
26	9,946.2479	0.382	66	8,813.9104	12.677	106	14.670756	540.981
27	9,942.4484	0.403	67	8,702.1765	14.191	107	6.7341557	608.379
28	9,938.4416	0.427	68	8,578.6839	15.872	108	2.6372368	688.213
29	9,934.1979	0.451	69	8,442.5230	17.722	109	0.82225615	782.398
30	9,929.7176	0.480	70	8,292.9046	19.743	110	0.17892458	1,000.000
31	9,924.9513	0.510	71	8,129.1778	21.949			
32	9,919.8896	0.543	72	7,950.7505	24.384			
33	9,914.5031	0.580	73	7,756.8794	27.097			
34	9,908.7527	0.621	74	7,546.6912	30.137			
35	9,902.5994	0.676	75	7,319.2566	33.549			
36	9,895.9052	0.712	76	7,073.7029	37.365			
37	9,888.8593	0.759	77	6,809.3940	41.578			
38	9,881.3537	0.815	78	6,526.2730	46.167			
39	9,873.3004	0.882	79	6,224.9746	51.116			
40	9,864.5921	0.962	80	5,906.7788	56.402			
41	9,855.1024	1.055	81	5,573.6247	62.007			
42	9,844.7053	1.165	82	5,228.0210	67.908			
43	9,833.2362	1.295	83	4,872.9965	74.085			
44	9,820.5022	1.444	84	4,511.9806	80.518			

q_x SUM = 9,229.518; l_x SUM = 761,403.52595423

102

BLENDED 1983 GAM-E—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 40%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.243	45	9,818.6540	1.500	85	4,377.4844	83.130
6	9,997.5700	0.215	46	9,803.9260	1.682	86	4,013.5841	90.087
7	9,995.4205	0.195	47	9,787.4358	1.885	87	3,652.0123	97.536
8	9,993.4714	0.184	48	9,768.9865	2.104	88	3,295.8096	105.612
9	9,991.6326	0.179	49	9,748.4326	2.341	89	2,947.7326	114.786
10	9,989.8441	0.179	50	9,725.6115	2.587	90	2,609.3742	124.826
11	9,988.0559	0.186	51	9,700.4513	2.844	91	2,283.6565	135.665
12	9,986.1981	0.193	52	9,672.8632	3.112	92	1,973.8442	147.532
13	9,984.2708	0.201	53	9,642.7612	3.395	93	1,682.6390	160.592
14	9,982.2640	0.209	54	9,610.0240	3.697	94	1,412.4206	175.438
15	9,980.1777	0.218	55	9,574.4957	4.021	95	1,164.6284	192.011
16	9,978.0020	0.226	56	9,535.9967	4.373	96	941.00694	209.972
17	9,975.7470	0.236	57	9,494.2958	4.760	97	743.42183	229.060
18	9,973.3927	0.246	58	9,449.1030	5.194	98	573.13363	249.798
19	9,970.9392	0.257	59	9,400.0244	5.685	99	429.96600	272.930
20	9,968.3767	0.268	60	9,346.5853	6.244	100	312.61538	298.732
21	9,965.7052	0.281	61	9,288.2252	6.880	101	219.22716	327.499
22	9,962.9048	0.294	62	9,224.3222	7.608	102	147.43048	359.762
23	9,959.9757	0.309	63	9,154.1436	8.440	103	94.390596	395.461
24	9,956.8981	0.325	64	9,076.8826	9.392	104	57.062797	436.807
25	9,953.6621	0.342	65	8,991.6325	10.475	105	32.137368	485.215
26	9,950.2579	0.360	66	8,897.4451	11.702	106	16.543835	542.376
27	9,946.6758	0.380	67	8,793.3272	13.081	107	7.5708559	610.053
28	9,942.8961	0.403	68	8,678.3017	14.623	108	2.9522325	690.076
29	9,938.8891	0.426	69	8,551.3989	16.339	109	0.91496771	784.343
30	9,934.6551	0.453	70	8,411.6776	18.238	110	0.19731919	1,000.000
31	9,930.1547	0.482	71	8,258.2654	20.340			
32	9,925.3684	0.513	72	8,090.2923	22.681			
33	9,920.2767	0.548	73	7,906.7964	25.301			
34	9,914.8404	0.586	74	7,706.7465	28.239			
35	9,909.0303	0.637	75	7,489.1157	31.528			
36	9,902.7182	0.672	76	7,252.9989	35.196			
37	9,896.0636	0.716	77	6,997.7224	39.235			
38	9,888.9780	0.768	78	6,723.1668	43.630			
39	9,881.3833	0.831	79	6,429.8350	48.366			
40	9,873.1719	0.905	80	6,118.8496	53.427			
41	9,864.2367	0.990	81	5,791.9378	58.799			
42	9,854.4711	1.090	82	5,451.3776	64.466			
43	9,843.7297	1.207	83	5,099.9491	70.418			
44	9,831.8483	1.342	84	4,740.8209	76.640			

q_x SUM = 9,128.062; l_x SUM = 767,900.78919130

BLENDED 1983 GAM-F—MORTALITY TABLE
PIVOTAL AGE IS 65—RATIO OF MALE l_x TO TOTAL IS 20%

Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$	Age	l_x	$1,000q_x$
5	10,000.0000	0.208	45	9,843.9848	1.259	85	4,847.0977	75.989
6	9,997.9200	0.178	46	9,831.5912	1.404	86	4,478.7716	82.733
7	9,996.1404	0.157	47	9,817.7876	1.565	87	4,108.2294	90.051
8	9,994.5710	0.145	48	9,802.4228	1.740	88	3,738.2792	98.070
9	9,993.1218	0.139	49	9,785.3666	1.929	89	3,371.6662	107.328
10	9,991.7328	0.138	50	9,766.4906	2.123	90	3,009.7920	117.518
11	9,990.3539	0.145	51	9,745.7563	2.325	91	2,656.0873	128.583
12	9,988.9053	0.154	52	9,723.0974	2.538	92	2,314.5596	140.794
13	9,987.3670	0.162	53	9,698.4202	2.765	93	1,988.6835	154.318
14	9,985.7490	0.171	54	9,671.6041	3.014	94	1,681.7938	169.519
15	9,984.0414	0.180	55	9,642.4539	3.289	95	1,396.6978	186.488
16	9,982.2443	0.188	56	9,610.7399	3.595	96	1,136.2304	205.218
17	9,980.3676	0.198	57	9,576.1893	3.939	97	903.05547	224.983
18	9,978.3915	0.208	58	9,538.4687	4.326	98	699.88334	246.357
19	9,976.3160	0.219	59	9,497.2053	4.760	99	527.46218	270.153
20	9,974.1312	0.229	60	9,451.9986	5.249	100	384.96669	296.651
21	9,971.8471	0.242	61	9,402.3851	5.797	101	270.76594	326.162
22	9,969.4339	0.254	62	9,347.8795	6.414	102	182.45238	359.253
23	9,966.9017	0.267	63	9,287.9222	7.109	103	116.90582	395.686
24	9,964.2405	0.283	64	9,221.8944	7.891	104	70.647824	437.722
25	9,961.4206	0.298	65	9,149.1244	8.770	105	39.723717	486.745
26	9,958.4521	0.315	66	9,068.8866	9.756	106	20.388396	544.437
27	9,955.3152	0.333	67	8,980.4105	10.873	107	9.2881988	612.544
28	9,952.0001	0.353	68	8,882.7665	12.148	108	3.5987684	692.878
29	9,948.4870	0.374	69	8,774.8587	13.608	109	1.1052609	787.313
30	9,944.7663	0.398	70	8,655.4504	15.279	110	0.23507463	1,000.000
31	9,940.8083	0.424	71	8,523.2038	17.190			
32	9,936.5934	0.452	72	8,376.6899	19.364			
33	9,932.1021	0.482	73	8,214.4837	21.821			
34	9,927.3148	0.516	74	8,035.2355	24.579			
35	9,922.1923	0.558	75	7,837.7374	27.656			
36	9,916.6557	0.588	76	7,620.9769	31.064			
37	9,910.8247	0.628	77	7,384.2389	34.800			
38	9,904.6007	0.672	78	7,127.2674	38.860			
39	9,897.9448	0.726	79	6,850.3018	43.237			
40	9,890.7589	0.787	80	6,554.1153	47.924			
41	9,882.9749	0.855	81	6,240.0159	52.917			
42	9,874.5250	0.935	82	5,909.8130	58.217			
43	9,865.2923	1.027	83	5,565.7614	63.827			
44	9,855.1606	1.134	84	5,210.5155	69.747			

q_x SUM = 8,947.881; l_x SUM = 781,235.84575973

104

APPENDIX E
EXTENSION OF THE 1983 GAM MALE TABLE
SET BACK THREE AND SIX YEARS

A three-year setback of the male 1983 GAM mortality table provides a quick and easy approximation of the blended 50 percent male GAM table. However, the setback table would begin at age 8 and end at age 113. The ending age is not important and presents no problems. It is, however, convenient to have the same starting age as the other GAM tables. Further, a simple age setback creates anomalous mortality rates at the very young ages, although a need for GAM rates at such young ages is unlikely.

A method described by John H. Cook[1] in extending the 1958 CSO table setback six years can be used. Mortality rates at ages 10 and under are kept unchanged. Values in Column 2 at ages 11, 12, and 13 were obtained by straight line interpolation. Note that the mortality rates reduce to age 10 and then increase.

An extension to the six-year setback male table is provided in Column 5 for those who wish to use that table in lieu of the female table. Values from the extended three-year setback table were kept through age 14 while the age 18 rate became that for age 15. The values in Column 5 at ages 15, 16, and 17 were obtained by straight line interpolation.

VALUES OF $1,000q_x$.

AGE	1983 GRADUATED MALE (1)	COLUMN 1 ADJUSTED (2)	LOADING = 10% OF COLUMN 2 (3)	1983 GAM SETBACK THREE YEARS (4)	1983 GAM SETBACK SIX YEARS (5)
5.......	0.380	—	—	0.342	0.342
6.......	0.353	—	—	0.318	0.318
7.......	0.336	—	—	0.302	0.302
8.......	0.327	—	—	0.294	0.294
9.......	0.324	—	—	0.292	0.292
10.......	0.325	—	—	0.293	0.293
11.......	0.331	0.326*	0.033	0.294†	0.294
12.......	0.338	0.328*	0.033	0.295	0.295
13.......	0.344	0.329*	0.033	0.296	0.296
14.......	0.352	—	—	0.298	0.298
15.......	—	—	—	0.304	0.299*
16.......	—	—	—	0.310	0.300*
17.......	—	—	—	0.317	0.302*
18.......	—	—	—	0.325	0.304

* Interpolated.
† Adjusted to improve grading.

[1] RSA 3(1977): 825-830.