

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1974 REPORTS**

II. 1965-70 AGE LAST BIRTHDAY BASIC TABLES

THE 1965-70 Age Last Birthday (ALB) Basic Tables were prepared by the Committee on Mortality under Ordinary Insurance and Annuities to facilitate the analysis by the Committee of future mortality trends and to provide companies, on an age last birthday basis, with an up-to-date basis for mortality comparisons. These tables are derived from the 1965-70 Age Nearest Birthday (ANB) Basic Tables, published in *TSA, 1973 Reports*, pages 199-223, as follows:

NOTATION

An ultimate mortality rate for attained age x is shown as either $q_{\underline{x}}$ or q_x , depending on whether x is the attained age on the age last birthday basis or the age nearest birthday basis, respectively.

A select mortality rate for issue age x in policy year t is shown as either $q_{[\underline{x}]+t-1}$ or $q_{[x]+t-1}$, depending on whether x is the issue age on the age last birthday basis or the age nearest birthday basis, respectively.

ULTIMATE RATES (TABLE 1)

The ultimate mortality rates equal

$$q_{\underline{x}} = \frac{1}{2}[q_x + q_{x+1}] .$$

The ultimate mortality rate for age 100 was determined by using the above formula together with a value for q_{101} obtained in the manner used to extend the 1965-70 ANB Ultimate Basic Table to attained age 100.

Three ultimate tables, for male lives, female lives, and male and female lives combined, show mortality rates for attained ages 15-100 for policy years 16 and over combined.

SELECT RATES (TABLE 2)

The select mortality rates for issue-age group 0 equal

$$\begin{aligned} q_{[0]+t-1} &= (0.85)q_{[0]} + (0.15)q_{[1]} && \text{for } t = 1 \\ &= \frac{1}{2}[q_{[0]+t-1} + q_{[1]+t-1}] && \text{for } t > 1 , \end{aligned}$$

where t is the policy year.

The select mortality rates for issue-age groups 1, 2-4, 5-9, and 10-14 equal the rates determined above such that

$$\begin{aligned} q_{[x]+t-1} &= q_{[0]+x+t-1} \quad \text{for } x+t < 15 \\ &= q_{x+t-1} \quad \text{for } x+t > 15, \end{aligned}$$

where t is the policy year and x represents the central age of a particular age group.

The select mortality rates for the other issue-age groups were set equal to the corresponding ultimate mortality rates (i.e., $q_{[x]+t-1} = q_{x+t-1}$), where t is the policy year and x represents the central age of a particular age group--the central age for age group 70 and over being 72) to prevent the select rates from exceeding the corresponding ultimate rates in the following situations:

Issue-Age Group	Policy Year
COMBINED MALE AND FEMALE TABLE	
15-19.....	11-15
MALE TABLE	
15-19.....	11-15
20-24, 30-34.....	15
FEMALE TABLE	
15-19.....	6-15
20-24.....	4-15
25-29.....	3-15
30-34.....	1-15
70+.....	13-15

The remaining select mortality rates, except for issue-age group 70 and over, equal

$$q_{[x]+t-1} = (0.9)q_{[x]+t-1} + (0.1)q_{[x+5]+t-1}.$$

The remaining select mortality rates for issue-age group 70 and over (central age = 72), equal

$$q_{[72]+t-1} = q_{[72]+t-1} - q_{[67]+t-1} + q_{[67]+t-1}.$$

Three select tables, for male lives, female lives, and male and female lives combined, show mortality rates for issue-age groups 0, 1, 2-4, 5-9, 10-14 and so on, through 70 and over, for each of the first fifteen policy years separately.

TABLE 1
1965-70 ULTIMATE BASIC TABLES—AGE LAST BIRTHDAY
GRADUATED MORTALITY RATES PER 1,000

Attained Age	Male and Female Lives Combined	Male Lives	Female Lives	Attained Age	Male and Female Lives Combined	Male Lives	Female Lives
15	.63	.74	.39	60	16.58	17.26	8.98
16	.74	.88	.44	61	18.14	18.85	9.73
17	.86	1.01	.50	62	19.85	20.66	10.44
18	.97	1.12	.55	63	21.74	22.72	11.16
19	1.04	1.18	.58	64	23.82	24.99	11.98
20	1.08	1.18	.59	65	26.09	27.45	12.99
21	1.09	1.15	.57	66	28.53	30.07	14.16
22	1.08	1.12	.56	67	31.13	32.81	15.52
23	1.07	1.11	.55	68	33.81	35.60	17.13
24	1.05	1.09	.54	69	36.59	38.46	19.02
25	1.03	1.08	.54	70	39.78	41.69	21.35
26	1.02	1.06	.56	71	43.50	45.47	24.34
27	1.05	1.07	.59	72	47.62	49.60	28.01
28	1.10	1.11	.62	73	52.15	54.08	32.25
29	1.15	1.16	.65	74	57.09	59.04	36.79
30	1.18	1.21	.67	75	62.40	64.53	41.40
31	1.18	1.24	.69	76	68.14	70.56	46.42
32	1.19	1.27	.73	77	74.34	77.17	51.94
33	1.23	1.31	.80	78	81.01	84.32	57.59
34	1.29	1.37	.88	79	88.23	91.80	63.22
35	1.37	1.45	.97	80	96.06	99.45	69.18
36	1.48	1.57	1.09	81	104.70	107.46	75.83
37	1.61	1.71	1.24	82	114.07	116.07	83.46
38	1.77	1.89	1.38	83	124.11	125.57	92.64
39	1.96	2.09	1.53	84	134.86	136.20	102.28
40	2.19	2.32	1.68	85	146.03	147.87	110.83
41	2.44	2.56	1.84	86	157.85	160.62	120.55
42	2.72	2.82	1.99	87	170.25	174.34	133.05
43	3.03	3.12	2.17	88	181.48	187.53	145.07
44	3.37	3.45	2.37	89	190.58	198.30	158.45
45	3.73	3.81	2.59	90	199.02	206.64	178.65
46	4.11	4.21	2.81	91	207.99	214.04	200.56
47	4.54	4.67	3.05	92	218.87	223.92	217.51
48	5.04	5.22	3.32	93	232.06	239.45	229.40
49	5.61	5.84	3.60	94	244.76	258.38	236.27
50	6.23	6.51	3.90	95	256.92	273.86	244.24
51	6.89	7.17	4.22	96	269.46	286.31	255.99
52	7.59	7.87	4.58	97	281.87	299.49	267.78
53	8.36	8.64	4.95	98	294.54	312.95	279.81
54	9.22	9.54	5.33	99	307.44	326.65	292.06
55	10.19	10.60	5.73	100	320.54	340.57	304.51
56	11.28	11.80	6.19				
57	12.47	13.08	6.74				
58	13.76	14.42	7.41				
59	15.13	15.80	8.18				

TABLE 2
1965-70 SELECT BASIC TABLES—AGE LAST BIRTHDAY
GRADUATED MORTALITY RATES PER 1,000

ISSUE AGE GROUP	POLICY YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Male and Female Lives Combined														
0.....	4.77	1.04	.70	.57	.49	.44	.39	.36	.33	.30	.29	.31	.36	.43	.52
1.....	1.04	.70	.57	.49	.44	.39	.36	.33	.30	.29	.31	.36	.43	.52	.63
2-4.....	.57	.49	.44	.39	.36	.33	.30	.29	.31	.36	.43	.52	.63	.74	.86
5-9.....	.36	.33	.30	.29	.31	.36	.43	.52	.63	.74	.86	.97	1.04	1.08	1.09
10-14.....	.36	.43	.52	.63	.74	.86	.97	1.04	1.08	1.09	1.08	1.07	1.05	1.03	1.02
15-19.....	.78	.84	.90	.95	1.00	.99	.98	.97	.98	.99	1.05	1.10	1.15	1.18	1.18
20-24.....	.66	.69	.78	.80	.80	.80	.81	.83	.87	.91	.99	1.09	1.19	1.31	1.44
25-29.....	.58	.64	.75	.78	.82	.87	.95	1.05	1.18	1.31	1.49	1.72	1.94	2.17	2.41
30-34.....	.74	.88	1.01	1.15	1.25	1.38	1.55	1.77	2.03	2.30	2.62	2.92	3.24	3.60	4.03
35-39.....	.90	1.17	1.48	1.76	2.00	2.28	2.62	2.95	3.33	3.79	4.29	4.77	5.29	5.98	6.79
40-44.....	1.38	1.92	2.44	2.87	3.11	3.68	4.33	4.86	5.42	6.04	6.79	7.56	8.56	9.68	10.80
45-49.....	1.98	2.81	3.70	4.40	4.81	5.66	6.73	7.43	8.09	8.95	9.96	11.31	13.09	14.83	16.63
50-54.....	2.66	4.16	5.52	6.52	7.20	8.72	10.28	11.20	12.21	13.64	15.12	17.07	19.54	22.13	24.45
55-59.....	3.70	5.65	7.90	9.41	10.26	11.76	14.03	15.23	16.70	19.06	22.08	25.64	29.03	32.95	36.38
60-64.....	5.73	8.49	11.73	14.71	16.30	17.75	19.73	22.04	25.16	29.12	34.14	39.87	44.16	47.66	51.50
65-69.....	9.01	12.71	16.48	19.84	23.51	26.19	29.44	32.46	37.63	44.60	52.95	60.35	65.85	70.23	76.56
70 and over.....	9.38	13.33	17.48	22.05	29.36	37.60	46.64	56.77	67.94	79.91	91.41	105.20	117.31	126.25	137.19

TABLE 2—Continued

ISSUE-AGE GROUP	POLICY YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Male Lives														
0.....	5.13	1.09	.75	.59	.51	.45	.41	.37	.34	.32	.31	.32	.38	.47	.60
1.....	1.09	.75	.59	.51	.45	.41	.37	.34	.32	.31	.32	.38	.47	.60	.74
2-4.....	.59	.51	.45	.41	.37	.34	.32	.31	.32	.38	.47	.60	.74	.88	1.01
5-9.....	.37	.34	.32	.31	.32	.38	.47	.60	.74	.88	1.01	1.12	1.18	1.18	1.15
10-14.....	.38	.47	.60	.74	.88	1.01	1.12	1.18	1.18	1.15	1.12	1.11	1.09	1.08	1.06
15-19.....	.90	.97	1.01	1.05	1.08	1.07	1.06	1.06	1.05	1.05	1.07	1.11	1.16	1.21	1.24
20-24.....	.68	.73	.80	.83	.83	.82	.84	.87	.92	.98	1.05	1.16	1.28	1.43	1.57
25-29.....	.59	.65	.77	.80	.84	.89	.97	1.07	1.20	1.33	1.52	1.74	1.96	2.22	2.53
30-34.....	.76	.89	1.02	1.16	1.26	1.41	1.56	1.79	2.04	2.31	2.63	2.93	3.25	3.68	4.21
35-39.....	.91	1.19	1.50	1.77	2.02	2.31	2.63	2.96	3.35	3.80	4.30	4.80	5.31	6.00	6.93
40-44.....	1.42	1.97	2.47	2.94	3.28	3.86	4.36	4.89	5.46	6.08	6.84	7.59	8.61	9.76	11.01
45-49.....	2.01	2.83	3.72	4.44	5.07	5.87	6.78	7.54	8.25	9.17	10.31	11.65	13.44	15.30	17.20
50-54.....	2.71	4.18	5.55	6.59	7.33	8.90	10.52	11.66	12.74	14.28	15.84	17.84	20.41	23.10	25.34
55-59.....	3.87	5.79	8.10	9.86	10.83	12.36	14.39	15.91	17.56	20.05	22.90	26.40	29.84	33.80	37.36
60-64.....	6.28	9.05	12.48	15.61	17.10	18.25	19.99	22.31	25.44	29.47	34.98	41.53	46.06	49.49	52.59
65-69.....	9.80	13.75	17.62	20.93	24.50	27.16	30.27	33.36	38.57	45.70	54.14	61.59	67.13	72.43	78.76
70 and over.....	10.44	14.44	18.67	23.31	30.72	39.37	48.76	59.26	70.51	82.93	94.60	108.49	120.56	129.45	139.98

TABLE 2—Continued

ISSUE-AGE GROUP	POLICY YEAR														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Female Lives														
0.....	4.26	.97	.64	.52	.45	.40	.35	.31	.28	.26	.26	.27	.28	.31	.35
1.....	.97	.64	.52	.45	.40	.35	.31	.28	.26	.26	.27	.28	.31	.35	.39
2-4.....	.52	.45	.40	.35	.31	.28	.26	.26	.27	.28	.31	.35	.39	.44	.50
5-9.....	.31	.28	.26	.26	.27	.28	.31	.35	.39	.44	.50	.55	.58	.59	.57
10-14.....	.28	.31	.35	.39	.44	.50	.55	.58	.59	.57	.56	.55	.54	.54	.56
15-19.....	.46	.50	.50	.51	.53	.56	.55	.54	.54	.56	.59	.62	.65	.67	.69
20-24.....	.50	.55	.53	.54	.56	.59	.62	.65	.67	.69	.73	.80	.88	.97	1.09
25-29.....	.56	.61	.65	.67	.69	.73	.80	.88	.97	1.09	1.24	1.38	1.53	1.68	1.84
30-34.....	.73	.80	.88	.97	1.09	1.24	1.38	1.53	1.68	1.84	1.99	2.17	2.37	2.59	2.81
35-39.....	.78	1.00	1.24	1.49	1.63	1.85	2.06	2.27	2.49	2.71	2.92	3.17	3.48	3.81	4.16
40-44.....	.90	1.23	1.61	1.95	2.19	2.51	2.82	3.07	3.33	3.61	3.86	4.12	4.77	5.34	5.91
45-49.....	1.20	1.62	2.30	2.66	2.98	3.37	3.81	4.17	4.57	4.95	5.45	5.92	6.78	7.49	8.82
50-54.....	1.89	2.64	3.53	4.16	4.61	5.03	5.59	6.07	6.55	6.87	8.00	8.92	10.24	11.47	12.97
55-59.....	2.07	2.95	3.93	4.53	5.05	5.53	6.21	6.84	7.57	8.78	10.63	12.46	14.78	16.34	17.93
60-64.....	2.98	4.63	6.41	7.32	8.65	10.53	12.09	13.10	14.12	15.23	16.73	18.81	21.18	23.29	25.59
65-69.....	4.29	6.64	8.58	11.40	13.84	16.17	18.64	21.18	23.83	26.76	29.26	31.73	35.13	38.11	40.59
70 and over...	6.36	9.26	12.50	16.12	21.95	28.96	36.94	46.12	56.50	67.34	80.40	90.97	102.28	110.83	120.55