

Table 3. Select—First 5 years from entry—All durations combined

Age group	Males				Females			
	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E
1920-30								
-49	1,169	7.9	9	1.14	2,645	14.4	12	.83
50-59	2,800	33.1	39	1.18	6,768	61.4	62	1.01
60-69	5,314	141.0	126	.89	13,635	208.2	206	.99
70-79	3,212	196.6	187	.95	7,104	283.7	247	.87
80-	557	71.9	49	.68	1,099	104.4	117	1.12
Total	13,052	450.5	410	.91	31,251	672.1	644	.96
1930-35								
-49	498	3.4	5	1.47	1,023	5.9	6	1.02
50-59	1,407	17.1	17	.99	3,496	32.5	24	.74
60-69	3,548	98.1	95	.97	7,340	116.5	118	1.01
70-79	2,299	140.7	120	.85	4,630	187.7	164	.87
80-	345	45.3	42	.93	676	64.4	70	1.09
Total	8,097	304.6	279	.92	17,165	407.0	382	.94
1935-40								
-49	500	3.4	4	1.18	1,293	7.1	2	.28
50-59	1,537	18.1	20	1.10	3,870	34.8	29	.83
60-69	4,391	121.3	125	1.03	8,923	138.7	127	.92
70-79	2,860	173.5	172	.99	5,743	233.2	207	.89
80-	463	57.5	52	.90	889	89.6	78	.87
Total	9,751	373.8	373	1.00	20,718	503.4	443	.88

Table 4. Ultimate—After 5 years from entry, 1920-30

Age group	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E
Males				
-49	2,160	20	21	.96
50-54	2,111	26	23	
55-59	3,883	67	49	
60-64	5,910	153	137	.85
65-69	7,863	332	296	
70-74	8,586	568	484	.87
75-79	7,551	754	733	
80-84	4,744	694	673	.97
85-89	1,899	412	393	
90-94	473	136	149	.99
95-99	62	22	25	
100-	4	2	4	1.21
Total	45,246	3186	2987	.94
Females				
-49	7,030	51	49	.80
50-54	7,127	74	51	
55-59	11,514	151	137	
60-64	18,181	294	297	.97
65-69	26,066	628	633	
70-74	30,625	1306	1153	.92
75-79	28,515	2021	1874	
80-84	20,018	2240	2201	.96
85-89	9,484	1686	1656	
90-94	2,776	711	685	.98
95-99	434	142	149	
100-	36	16	17	1.05
Total	161,806	9320	8902	.95

MORTALITY EXPERIENCE OF GOVERNMENT LIFE ANNUITANTS, 1920-1940

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IN accordance with the arrangements referred to in paragraph 25 of the *Report* of 31 December 1923 on the mortality experience of Government life annuitants for the years 1900-20 (H.M. Stationery Office, 1924), the experience of Government life annuitants has been kept continuously under review. Investigations have been made on the basis of the periods 1920-30, 1930-35 and 1935-40, and the results incorporated in Reports to the Treasury of 26 June 1933 and 8 August 1944 respectively. By permission of the Lords Commissioners of His Majesty's Treasury, tables based on these Reports appear below.

The experience for 1900-20 was investigated both on the basis of lives and on that of contracts. The results showed no material difference, and the observations for 1920-40 have been based on lives only.

Individuals who had purchased more than one annuity were included in respect of the first contract only, with the following exceptions:

- (a) lives entering into the experiences of both single- and joint-life annuities were counted once in each section,
- (b) lives entering into the experience of (say) both the National Debt Office and the Post Office Savings Bank were counted once in each section.

The actual deaths recorded included, in addition to deaths duly proved,

- (a) deaths notified as having occurred in the period, though not proved,
- (b) deaths presumed to have occurred in the period by reason of cessation of claim to the annuities.

It may be noted that in the experience of the period 1935-40 certain cases of residents in the Channel Islands and abroad were treated on their merits, survival being generally assumed where claim in respect of the annuities had been made up to 1939.

A brief reference to the legislation governing the grant of Government life annuities and the bases on which rates are calculated appeared in paragraphs 2-4 of the *Report* of 31 December 1923. These particulars have been amplified in a Note on the legislative provisions, mortality bases and range of published tables of rates of both British Government annuities and insurances in the period 1808-1944.

Paragraph 5 of the 1923 *Report* referred to the business done in Government life annuities over the 23 years ended 31 December 1922. Comparable figures for the 22 years ended 31 December 1944 are as follows. On the average of those years, 353 annuities were purchased yearly through the National Debt Office and 1243 through the Post Office Savings Bank and Trustee Savings Banks. The consideration moneys paid to the National Debt Office (including the cash equivalent of securities) amounted on average to £395,469 a year over the same period, while the average amount received by the Savings Banks was

£620,816. The average amount of the annuities purchased yearly through the National Debt Office was £34,367, and through the Savings Banks £51,203. The individual annuities bought through the National Debt Office averaged £97 each and those bought through the Savings Banks £41 each.

As regards the total amount paid for Government annuities yearly, the 1923 *Report* noted that the highest figure in the period 1900 onwards was £1,288,045 in the year 1923. It will be seen from the figures above that the yearly average for the period 1923 to 1944 exceeded £1,000,000 and it may be stated that this figure was exceeded in 1932, 1933 and 1935, substantially exceeded in 1937 and 1940, while in the years 1938 and 1939 the totals reached were £1,796,420 and £2,384,273 respectively. The years immediately preceding the present war were therefore active ones for the granting of life annuities. Among the reasons for this activity was, no doubt, the reduction of the rate of interest on War Loan from 5% to $3\frac{1}{2}$ % in 1932; the increase in the limit of Savings Bank annuities from £100 to £300 by section 11 of the Savings Banks Act 1929 was not without effect, the average of the individual annuities increasing from £23 in the twenty-three years ended 31 December 1922 to £41 in the twenty-two years ended 31 December 1944.

Similar activity was observed in the business done in the United Kingdom by assurance companies. During the ten years 1913 to 1922 the average amount of the sums paid to companies established in Great Britain exceeded £2,000,000. In the nineteen years 1924 to 1942 the average amount was more than £7,000,000 a year, while in the period 1932 to 1939 the average sums so paid exceeded £12,000,000 a year.

The extent of the data dealt with in the investigations is shown in Table 1.

Table 1

	Males		Females	
	Exposed to risk	Actual deaths	Exposed to risk	Actual deaths
Experience 1920-30				
Existing at contract anniversary in 1920	41,379	2791	151,437	8561
New entrants: First 5 years from entry	13,052	410	31,251	644
After 5 years from entry	3,867	196	10,369	341
Total	58,298	3397	193,057	9546
Experience 1930-35				
Existing at contract anniversary in 1920	11,338	966	45,400	3403
New entrants: First 5 years from entry	8,097	279	17,165	382
After 5 years from entry	9,708	517	25,326	1072
Total	29,143	1762	87,891	4857
Experience 1935-40				
Existing at contract anniversary in 1920	7,067	729	30,074	2647
New entrants: First 5 years from entry	9,751	373	20,718	443
After 5 years from entry	13,660	881	34,755	1728
Total	30,478	1983	85,547	4818

The results of the mortality investigation are shown in Tables 2-6. In the ultimate experience (Tables 4-6) the actual deaths are compared with the numbers expected by reference to the 'ultimate, five years and upwards' mortality rates prepared in connexion with the 1900-20 experience. In the select period (Tables 2 and 3), in computing the expected deaths for the first five years from entry, effect was given to selection by scaling down the same ultimate rates of mortality by the series of percentages derived from the 1900-20 experience (paragraph 4 (i) of the Appendix to the *Report*).

It is to be noted that in the examination of the experience of the decennium 1920-30 the contracts existing at contract anniversaries in 1920 were not subdivided according to duration. It follows that some of the data included in the ultimate experience for the years 1920-25 should properly have been dealt with as select. It has not been considered necessary to undertake the revision of the 1920-30 experience, as the deficiency in the select data and the corresponding inflation of the ultimate data are not of sufficient magnitude to lead to any material misrepresentation of the trend of the experience over the period 1920-40. With this reservation the following table summarizes the broad results of the investigations of the decennium 1920-30 and of the two following quinquennia, 1930-35 and 1935-40.

	1920-30		1930-35		1935-40	
	Males	Females	Males	Females	Males	Females
Expected deaths	3637	9992	1917	5003	2079	5030
Actual deaths	3397	9546	1762	4857	1983	4818
Percentage of actual to expected deaths	93	95	92	97	95	96

The aggregate results of this table are dissected in Tables 2-6. These include the three classes of annuities granted by or on behalf of the Commissioners, to which reference is made in paragraphs 3 and 5 of the *Report* of 31 December 1923. For the present purpose the experience of the three classes has been combined, for, whilst the rates of mortality of Post Office annuitants tend on the whole to be rather lighter than those of the other classes, the separate results do not show any considerable divergence.

The results of the investigations are therefore shown for all classes combined. Tables 2 and 3 give the results for the select period for durations 0, 1, 2, 3, 4 (all ages combined) and for the separate age groups (all durations combined). Tables 4-6 give the results of the ultimate experience, combined in respect of 'existing in 1920' and 'new entrants' appropriate to the period of observations, in age groups.

[The Note referred to on p. 246 is entitled *British Government Annuities and Insurances 1808-1944. Legislative provisions, mortality bases and range of published tables of rates.* Report by Ernest Stephens Jones, O.B.E., I.S.O., F.I.A., Actuary to the National Debt Commissioners. (Pp. 24. 1945.) It is divided into two parts, one dealing with Government annuities and the other with Savings Bank annuities and insurances, the particulars in each part being in chronological order. There are two Appendices giving the titles of the official Reports on Government life annuitants experiences and of the principal legislation relating to Government life annuities.

Some copies of the booklet have been presented to the Institute Library.—Eds. J.I.A.]

Table 2. Select—First 5 years from entry—All ages combined

	Males			Females		
	1920-30	1930-35	1935-40	1920-30	1930-35	1935-40
Duration 0						
Exposed to risk	3375	1872	2517	7863	3805	5204
Expected deaths	83.6	48.7	65.9	112.9	60.2	79.3
Actual deaths	85	55	74	130	67	74
Ratio A/E	1.02	1.13	1.12	1.15	1.11	.93
Duration 1						
Exposed to risk	3000	1778	2057	7079	3633	4279
Expected deaths	94.0	57.7	69.8	136.7	76.2	90.2
Actual deaths	91	49	79	131	61	86
Ratio A/E	.97	.85	1.13	.96	.80	.95
Duration 2						
Exposed to risk	2581	1641	1783	6260	3319	3952
Expected deaths	95.0	64.6	72.8	147.5	83.6	102.5
Actual deaths	84	57	52	120	73	83
Ratio A/E	.88	.88	.71	.81	.87	.81
Duration 3						
Exposed to risk	2217	1452	1729	5420	3213	3737
Expected deaths	92.2	66.1	80.8	140.9	89.4	112.7
Actual deaths	70	52	84	135	93	106
Ratio A/E	.76	.79	1.04	.96	1.04	.94
Duration 4						
Exposed to risk	1879	1354	1665	4629	3195	3546
Expected deaths	85.7	67.5	84.5	134.1	97.6	118.7
Actual deaths	80	66	84	128	88	94
Ratio A/E	.93	.98	.99	.95	.90	.79

Age group	Males				Females			
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Total	8,097	304.6	279	.92	17,165	407.0	382	.94
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70-79	2,800	173.5	172	.99	5,743	233.2	207	.89
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Table 4. Ultimate—After 5 years from entry, 1920-30

Age group	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E
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65-69	7,863	332	296	.87
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90-94	473	136	149	
95-99	62	22	25	1.21
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Total	45,246	3186	2987	.94
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-49	7,030	51	49	.80
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55-59	11,514	151	137	
60-64	18,181	294	297	
65-69	26,066	628	633	.92
70-74	30,625	1306	1153	
75-79	28,515	2021	1874	.96
80-84	20,018	2240	2201	
85-89	9,484	1686	1656	.98
90-94	2,776	711	685	
95-99	434	142	149	1.05
100-	36	16	17	
Total	161,806	9320	8902	.95

Age group	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E
Males				
-49	733	6	5	.75
50-54	768	10	7	
55-59	1,460	25	22	.93
60-64	2,410	63	60	
65-69	3,730	158	161	.92
70-74	4,263	283	247	
75-79	3,844	383	352	.91
80-84	2,420	354	322	
85-89	1,135	246	220	.93
90-94	251	72	76	
95-	32	12	11	.91
Total	21,046	1612	1483	.92
Females				
-49	1,815	13	16	1.32
50-54	2,034	21	29	
55-59	4,343	56	49	.97
60-64	6,828	111	113	
65-69	10,987	266	282	.99
70-74	13,790	591	565	
75-79	14,013	994	930	.97
80-84	9,891	1108	1118	
85-89	5,044	900	893	.96
90-94	1,627	418	378	
95-	354	118	102	.86
Total	70,726	4596	4475	.97

Table 6. Ultimate—After 5 years from entry, 1935-40

Age group	Exposed to risk	Expected deaths	Actual deaths	Ratio A/E
Males				
-49	542	4	3	1.00
50-54	637	8	9	
55-59	1,209	21	14	1.09
60-64	2,139	55	69	
65-69	3,341	143	131	.92
70-74	4,605	306	283	
75-79	4,001	400	385	.93
80-84	2,652	388	351	
85-89	1,244	271	249	.96
90-94	316	91	99	
95-99	34	12	15	.94
100-	7	6	2	
Total	20,727	1705	1610	.94
Females				
-49	1,387	10	10	1.17
50-54	1,349	14	18	
55-59	3,084	40	42	.97
60-64	6,203	100	94	
65-69	9,131	221	233	.98
70-74	12,949	556	525	
75-79	13,152	936	858	.96
80-84	10,325	1159	1149	
85-89	5,155	920	856	.96
90-94	1,742	448	455	
95-99	304	100	114	1.10
100-	48	23	21	
Total	64,829	4527	4375	.97