

# ESTIMATES OF PERSONS WITH 1937 WAGE CREDITS WHO ATTAIN AGE 65 IN SPECIFIED YEARS

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VARIOUS ANALYSES of the data tabulated from the wage records of persons who received taxable wages in 1937 from employments covered by Federal old-age insurance have been presented in earlier issues of the Bulletin.<sup>1</sup> A further analysis is presented in this article, which gives estimates of the numbers of these individuals with credited wages in 1937 who attain age 65 in 1937 and specified years thereafter.

Obviously, the number of individuals who will become eligible for benefits at various times in the future cannot be obtained by projecting the number of persons who have 1937 wage credits. On the one hand, such a projection would involve an overestimate, since many of the individuals with 1937 wage credits will fail to have sufficient credited wages to qualify under the 1939 amendments.<sup>2</sup> On the other hand, an underestimate results from the fact that many individuals who did not have credited wages in 1937 will enter covered employment in subsequent years and obtain sufficient wages to qualify. Moreover, any great extension of coverage under the act, such as the inclusion of farm labor or domestic service, would entirely invalidate these estimates. With these qualifications in mind, however, it is deemed that these estimates will tend to show, in terms of persons covered in a single year, why rapidly increasing costs to the program in the future may be expected as more and more people become eligible at age 65 and continue to survive thereafter.

One factor affecting the number of aged individuals who will be eligible to receive benefits is the growth of the number and proportion of aged persons in the total population. Estimates based on the 1930 census figures and various estimates of the future population made by the National Resources Committee,<sup>3</sup> show an increase in the

number aged 65 and over both in absolute size and in proportion to the total population (table 1). Thus, there is an increase from 6.6 million in 1930 to 19.0 million in 1980 for the "low" estimate, to 22.2 million for the "medium" estimate, and to 25.7 million for the "high" estimate—in even the lowest estimate nearly a threefold increase. Similarly, the aged in 1930 represented only 5.4 percent of the total population, whereas by 1980 the corresponding figure for all three estimates is about 14 percent, or almost three times as great. These future population estimates thus indicate that the total number of persons attaining age

Table 1.—Estimates of future population of the United States<sup>1</sup>

[In thousands of persons]

Year	Total	Aged 65 and over	Aged 65 and over as percent of—	
			Total	1930
"Low" estimate <sup>2</sup>				
1930.....	122, 775	6, 634	5. 4	100
1940.....	131, 749	8, 393	6. 4	127
1950.....	139, 723	11, 002	8. 0	166
1960.....	137, 570	14, 040	10. 2	212
1970.....	134, 573	19, 187	12. 0	244
1980.....	127, 947	18, 994	14. 8	286
"Medium" estimate <sup>2</sup>				
1930.....	122, 775	6, 634	5. 4	100
1940.....	132, 829	8, 418	6. 3	127
1950.....	142, 301	11, 211	7. 9	169
1960.....	150, 010	14, 842	9. 9	224
1970.....	155, 601	18, 044	11. 6	272
1980.....	158, 967	22, 189	14. 0	334
"High" estimate <sup>2</sup>				
1930.....	122, 775	6, 634	5. 4	100
1940.....	133, 282	8, 443	6. 3	127
1950.....	146, 829	11, 424	7. 8	173
1960.....	160, 246	15, 683	9. 8	236
1970.....	173, 657	20, 027	11. 5	302
1980.....	186, 713	25, 739	13. 8	388

<sup>1</sup> Estimates from the National Resources Committee, *Population Statistics: Volume 1, National Data*, October 1937. 1930 figures are from the census.

<sup>2</sup> The general assumptions used in the various estimates are as follows (see source for further details):

Estimate	Fertility	Mortality	Net annual immigration
"Low"	Low	High	None
"Medium"	Medium	Medium	100, 000
"High"	High	Low	200, 000

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<sup>1</sup> *Social Security Bulletin*, Vol. 2, No. 3 (March 1939), pp. 3-9 and pp. 72-81; Vol. 2, No. 4 (April 1939), pp. 3-8; Vol. 2, No. 6 (June 1939), pp. 8-17; Vol. 2, No. 9 (September 1939), pp. 13-24.

<sup>2</sup> For a description of the qualifying conditions see Schmitter, Lyle L., and Goldwasser, Betti O., "The Revised Benefit Schedule Under Federal Old-Age Insurance," *Social Security Bulletin*, Vol. 2, No. 9 (September 1939), pp. 3-12. See also pp. 3-16 of the present issue.

<sup>3</sup> National Resources Committee, *Population Statistics: Volume 1, National Data*, October 1937.

65 in various future years will increase fairly rapidly because of the maturing age distribution of our population.

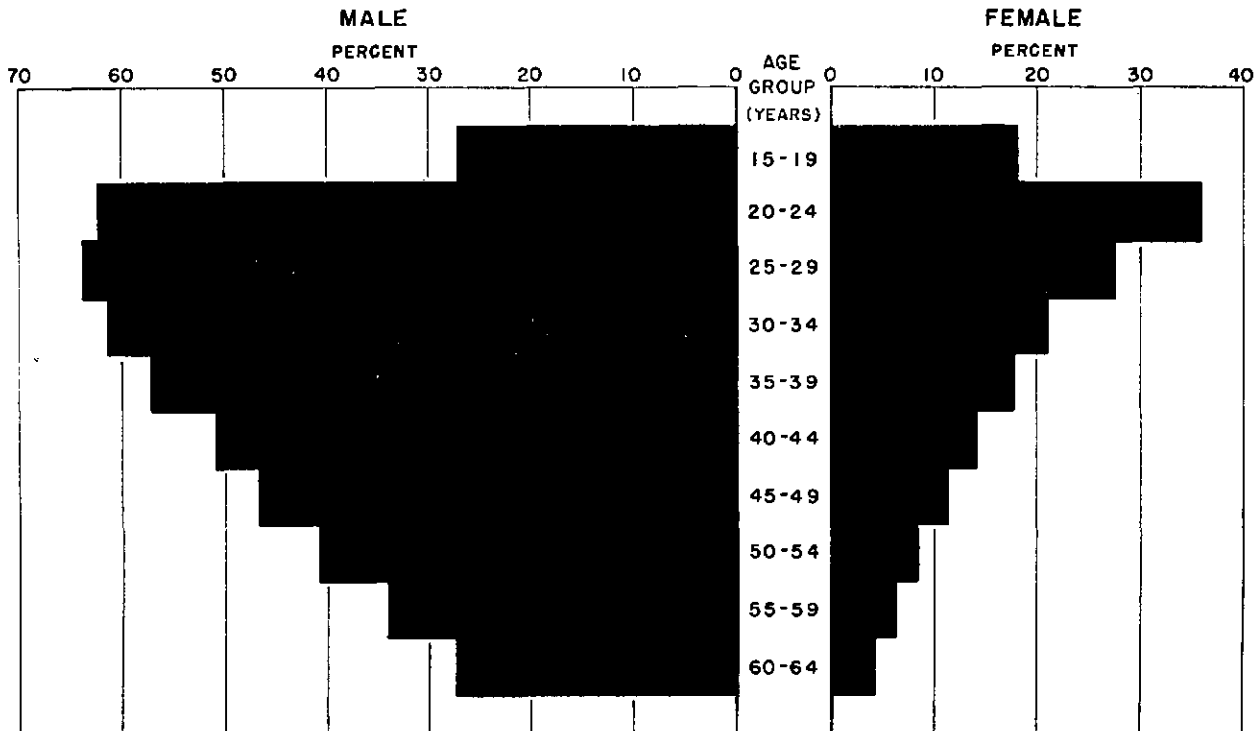
A second reason for the rapid growth in the number of persons with 1937 wage credits who will attain age 65 in future years lies in the fact that a smaller proportion of those now near age 65 than of those now younger have wage credits for that year. This fact may be seen from table 2 and chart I, which show individuals with 1937 wage credits by quinquennial age groups and sex as compared with the estimated total population in that year.<sup>4</sup> In 1937 more than 60 percent of the total male population between the ages of 20 and 35 had wage credits, with the maximum proportion in the age group 25-29. As might be expected, the proportion of males 15-19 who had wage credits was appreciably smaller than for those aged 20-34. For age groups over 35 the proportion gradually decreases until for the age group 60-64 only slightly more than one-fourth of

the men had wage credits. For all ages from 15-64 combined, about half of the men had wage credits. The decreasing trend from age 35 on may be due to several reasons, including increasing disability and unemployment at the older ages, shift to uncovered employment (such as self-employment), and also different occupational patterns of persons born in earlier decades.

When individuals with 1937 wage credits are compared with the estimates of the total population the ratios for women are entirely different from those for men. Among the women there is a definite maximum of about 35 percent in the age group 20-24, with a somewhat rapid decline for older groups; only about 4 percent in ages 60-64 had wage credits. For all ages combined, less than one-fifth of the women had wage credits as compared with almost one-half of the men. This trend for women is probably due to a large extent to the rapid withdrawal from employment at the younger ages as a result of marriage or the fact that women now old or middle-aged grew up in a period when gainful employment of women was less common. For men and women combined,

<sup>4</sup> Obtained by interpolation from the National Resources Committee "medium" estimate. Since the various population estimates all begin in 1930 at the census values, by 1940 there is very little "spread" among them (see table 1). Hence it makes little difference which estimate is used here.

Chart I.—Individuals with wage credits<sup>1</sup> as percent of estimated total population,<sup>2</sup> by age group and sex, 1937



<sup>1</sup> See footnote, table 2.  
<sup>2</sup> See footnote 2, table 2.

persons aged 15-64 with wage credits represented 33.8 percent of the total in these ages.<sup>5</sup>

The significance of the smaller proportion of older individuals with wage credits in 1937 is the fact that an increasingly larger proportion of those

**Table 2.—Individuals with wage credits<sup>1</sup> as percent of estimated total population,<sup>2</sup> by age group and sex, 1937**

(In thousands of persons)

Age group <sup>3</sup> (years)	Men			Women		
	Total population	With wage credits	Ratio (per-cent)	Total population	With wage credits	Ratio (per-cent)
Total, 15-64.....	44,070	21,539	48.9	43,773	8,189	18.7
15-19.....	6,146	1,662	27.0	6,022	1,085	18.0
20-24.....	5,805	3,614	62.3	5,774	2,067	35.8
25-29.....	5,402	3,449	63.8	5,542	1,526	27.5
30-34.....	4,916	3,018	61.4	5,108	1,073	21.0
35-39.....	4,406	2,569	57.1	4,606	814	17.7
40-44.....	4,372	2,227	50.9	4,364	610	14.0
45-49.....	4,097	1,910	46.6	3,976	451	11.3
50-54.....	3,544	1,446	40.8	3,367	281	8.3
55-59.....	2,984	1,016	34.0	2,818	172	6.1
60-64.....	2,308	628	27.2	2,196	90	4.1

<sup>1</sup> Based on wage items posted by July 9, 1938, relative to 96 percent of estimated total number of employees receiving such wages in 1937. Excludes persons under 15 and over 65, persons whose age, sex, or color is unknown, and employees holding railroad retirement account numbers.

<sup>2</sup> Obtained by interpolation from the "medium" estimate of National Resources Committee.

<sup>3</sup> Age last birthday (attained age) as of Dec. 31, 1937.

attaining age 65 in future years will have had 1937 wage credits. Of men reaching age 65 in the near future, only about one-fourth will have such wage credits; 40 years hence about two-thirds will. Similarly, only about one-twentieth of the women reaching age 65 in the near future will have had 1937 wage credits, whereas in the distant future this proportion will increase to one-third.

Table 3 and chart II compare individuals with wage credits in 1937 with estimated population by race<sup>6</sup> as well as by age and sex. Since white persons make up a large proportion of the total population, the figures for them differ only slightly from those for the total (table 2). For both Negro men and women the proportion with wage credits is appreciably smaller than for white persons. This is true especially for the men at the younger and older ages; in the middle years the proportions are closer. For all ages combined, 40 percent of the male Negro population 15-64 had wage credits in 1937 as compared with 50 percent

<sup>6</sup> On page 14 of the *Bulletin* for September 1939 a figure of 33.9 percent was given for this item. The small variation of 0.1 percent arises from the different population estimates used.

<sup>6</sup> Comparisons are made only for white persons and Negroes, since Mexicans are included as white in the wage data tabulations although they are included with "other races" in the population estimates.

of the white males. The proportion of Negro women who had wage credits in 1937 was appreciably smaller than that for white women, especially at the younger ages, for which there is a fivefold difference, while at the older ages there is only a twofold range. For all ages combined the proportion of Negro women with wage credits was only about 7½ percent, as compared with 20 percent for white women.

The number of persons with 1937 wage credits who will attain age 65 in various individual future years may be readily estimated from the age distribution by single years of age as obtained from the wage data and from mortality tables which give the probability of survival to age 65 at different attained ages. In order to obtain a reasonable range for these estimates, two different mortality tables have been selected—the United States 1920-29 tables for white lives and the Standard Annuity tables.<sup>7</sup> The projection is made only for differences in sex and not for differences in race. The 1920-29 tables are an overstatement of the mortality now experienced by white lives, but they represent a good aggregate which takes into account both white and colored

**Table 3.—Individuals with wage credits<sup>1</sup> as percent of estimated total population,<sup>2</sup> by age group, sex, and race, 1937**

Age group <sup>3</sup> (years)	Men		Women	
	White	Negro	White	Negro
Total, 15-64.....	50.1	40.3	20.1	7.6
15-19.....	23.4	18.0	19.9	4.2
20-24.....	64.5	47.2	39.4	9.8
25-29.....	65.4	53.7	26.9	11.2
30-34.....	62.9	53.2	22.7	9.7
35-39.....	57.5	57.3	18.7	10.2
40-44.....	51.9	45.2	14.8	7.0
45-49.....	47.8	37.3	12.0	5.2
50-54.....	42.1	29.4	8.8	3.8
55-59.....	35.3	22.6	6.4	2.9
60-64.....	28.2	16.7	4.3	2.1

<sup>1</sup> See footnotes 1, table 2.

<sup>2</sup> Obtained by interpolation from "medium" estimate of National Resources Committee.

<sup>3</sup> Age last birthday (attained age), as of Dec. 31, 1937.

lives. On the other hand, the Standard Annuity tables, which are now being used by many insurance companies in their calculations of annuity premiums, appreciably understate the mortality

<sup>7</sup> Actually, each of these two tables consists of two different life tables, one for males and the other for females. For a description of the data on which these tables are based and a discussion of other applicable tables, see Williamson, W. R., "Cost Factors in Old-Age Insurance," *Social Security Bulletin*, Vol. 1, No. 7 (July 1938), pp. 3-15.

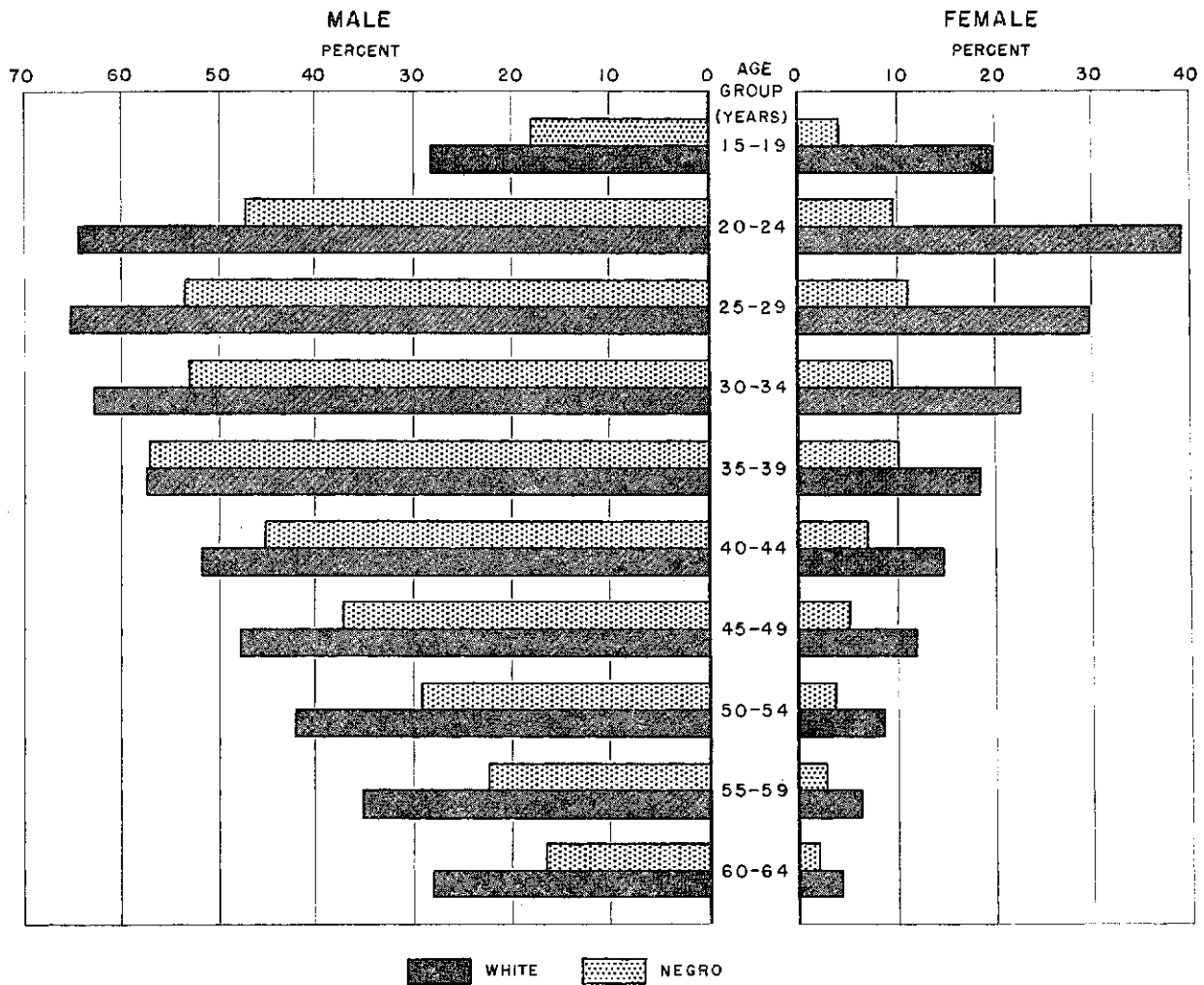
now experienced by the covered population. These two tables thus seem to give a reasonable range of probabilities of survival.

Table 4 shows on the basis of each mortality table the estimated number of persons with 1937 wage credits who attain age 65 in the various years specified; on the basis of the 1920-29 tables, about 90,000 such persons attained age 65 in 1937, of whom about 10 percent were women. The number who will reach age 65 in a given future year increases to 125,000 in 1940, 250,000 in 1950, and 725,000 in 1980. Between 1980 and 1985 the number declines because of the smaller proportion of the population among those now under 20 who had wage credits in 1937 (table 2). This decline is more apparent than real, however,

since many who were under 20 in 1937 will obtain wage credits after they reach age 20; but they are not included in these estimates because they did not have wage credits in 1937. The growth over the 14-year period 1937-50 is almost threefold; over the 44 years up to 1980 it is more than eightfold. The proportion of women increases steadily from 10 percent in 1937 to 16 percent in 1950, 22 percent in 1960, 28 percent in 1970, and 38 percent in 1980.

The projection based on the Standard Annuity tables gives, as would be expected, a larger number of survivors than results from the use of the 1920-29 tables. Thus, in 1950 about 270,000, instead of 250,000, persons with 1937 wage credits attain age 65, or a difference of about 8 percent,

**Chart II.—Individuals with wage credits<sup>1</sup> as percent of estimated total population,<sup>2</sup> by age group, sex, and race, 1937**



<sup>1</sup> See footnote 1, table 2.  
<sup>2</sup> See footnote 2, table 2.

**Table 4.—Estimated number of persons with 1937 wage credits<sup>1</sup> who attain age 65 in given years**

[In thousands of persons]

Year	Based on U. S. 1920-29 white tables			Based on Standard Annuity tables		
	Total	Men	Women	Total	Men	Women
1937	87.8	78.4	9.4	88.2	78.7	9.5
1938	104.2	91.9	12.3	105.6	93.1	12.5
1939	117.9	103.5	14.4	120.5	105.7	14.8
1940	125.2	109.8	15.4	129.0	113.0	16.0
1941	145.2	126.0	19.2	150.5	130.4	20.1
1942	147.7	127.5	20.2	154.2	132.8	21.4
1943	162.4	139.2	23.2	170.4	145.7	24.7
1944	172.1	147.4	24.7	181.4	155.0	26.4
1945	193.8	164.6	29.2	205.0	173.7	31.3
1950	251.4	210.7	40.7	271.5	226.7	44.8
1955	317.8	253.3	64.5	349.2	275.8	73.4
1960	374.8	290.9	83.9	418.0	322.4	95.6
1965	402.0	307.4	94.6	457.2	357.2	100.0
1970	518.0	373.7	144.3	594.8	425.3	169.5
1975	628.2	426.6	201.6	731.8	491.5	240.3
1980	724.6	451.0	273.6	856.6	526.1	330.5
1985	802.2	481.8	320.4	960.9	581.4	379.5

<sup>1</sup> See footnote 1, table 2.

while in 1980 there are 855,000 as compared with 725,000, or a difference of about 18 percent. The proportion of women in the total attaining age 65 is about the same as when the 1920-29 tables are used.

Table 5 gives a summary of the individuals with 1937 wage credits who will survive to age 65 in future decennial periods. It is estimated that during the 10-year period 1937-46 between 85 and 90 percent of those who would attain age 65 in that period will actually survive to that age. For subsequent decennial periods this percentage naturally declines, until for persons attaining age 65 in 1977-86 it is 60-70 percent. The Standard Annuity tables show higher proportions surviving than do the 1920-29 tables, with greater differences in the distant future. Since female mortality rates are lower than those of men, the estimated percentages of women who survive tend to be from 1 to 10 percent larger. Considering the entire group of approximately 30 million persons who had wage credits in 1937, nearly 19.6 million or 66 percent will survive to age 65, according to the 1920-29 tables. Using the Standard Annuity tables, the corresponding figure is 22.3 million persons, representing 75 percent of the total with 1937 credits. It might thus be said that from two-thirds to three-fourths of the original group of the individuals covered in 1937 will live to be age 65.

A projection of the individuals with 1937 wage

credits who will be aged 65 or over at the beginning of various future years is presented in table 6. These figures represent a further mortality projection beyond age 65 for the figures in table 4. As is usually the case under pension plans and retirement systems, the number of individuals who are over the retirement age builds up rapidly. The estimated growth is from less than 100,000 at the beginning of 1938 to more than 7.3 million in 1985 according to the 1920-29 tables and to 10.4 million according to the Standard Annuity tables. The 1985 estimate based on the Standard Annuity tables is 42 percent greater than the corresponding figure for the 1920-29 tables. This difference is due not only to the higher survival rates to age 65 according to the Standard Annuity tables (as indicated in tables 4 and 5) but also to the greater expectation of life after age 65. In the early years women constitute only about 10 percent of the total, whereas by 1985 they represent more than 35 percent.

**Table 5.—Estimated proportion of individuals with 1937 wage credits<sup>1</sup> who survive to age 65, by decades**

[In thousands of persons]

Period of attainment of age 65	Persons with wage credits in 1937	Survivors to age 65 based on—			
		U. S. 1920-29 white tables		Standard Annuity tables	
		Number	Percent	Number	Percent
<b>Total</b>					
Total, 1937-86	29,728	19,594	66	22,305	75
1937-46	1,700	1,451	85	1,512	89
1947-56	3,839	2,784	73	3,026	79
1957-66	5,027	4,020	67	4,507	76
1967-76	8,726	5,532	63	6,386	73
1977-86	9,430	5,807	62	6,876	73
<b>Men</b>					
Total, 1937-86	21,559	14,064	65	15,802	73
1937-46	1,477	1,253	85	1,303	89
1947-56	3,170	2,278	72	2,464	78
1957-66	4,678	3,071	66	3,419	73
1967-76	6,295	3,907	62	4,465	71
1977-86	8,939	5,555	60	6,151	70
<b>Women</b>					
Total, 1937-86	8,169	5,530	68	6,503	80
1937-46	229	198	86	209	91
1947-56	669	506	76	562	84
1957-66	1,349	949	70	1,038	81
1967-76	2,431	1,625	67	1,920	79
1977-86	3,491	2,252	65	2,724	78

<sup>1</sup> See footnote 1, table 2.

**Table 6.—Estimated number of persons with 1937 wage credits<sup>1</sup> who are aged 65 or over in given years<sup>2</sup>**

[In thousands of persons]

Year	Based on U. S. 1920-29 white tables			Based on Standard Annuity tables		
	Total	Men	Women	Total	Men	Women
1938.....	88	77	9	87	78	9
1939.....	185	164	21	189	167	22
1940.....	293	259	34	302	266	36
1941.....	403	355	48	420	369	51
1942.....	528	468	60	555	485	70
1943.....	650	567	83	689	600	89
1944.....	779	677	102	833	722	111
1945.....	910	788	122	984	849	135
1950.....	1,664	1,414	250	1,883	1,591	292
1955.....	2,488	2,061	427	2,948	2,422	526
1960.....	3,285	2,640	645	4,061	3,229	832
1965.....	4,007	3,115	892	5,147	3,946	1,201
1970.....	4,703	3,584	1,170	6,307	4,662	1,645
1975.....	5,661	4,094	1,567	7,664	5,426	2,238
1980.....	6,716	4,801	2,115	9,261	6,195	3,066
1985.....	7,338	4,655	2,683	10,417	6,440	3,977

<sup>1</sup> See footnote 1, table 2.

<sup>2</sup> As of Jan. 1.

In summary: This article has presented several elementary actuarial analyses of survival among workers who had wage credits in 1937. The estimates should not be taken as representing the number of persons who will become eligible for primary benefits under the 1939 amendments, or the num-

ber who will be in receipt of such benefits in a given year.<sup>3</sup> The actual figures for those eligible for benefits may be greater, or conceivably even less, than these estimates even if the act is not changed in the future. However, this study indicates definitely that the number of persons who will qualify for benefits will increase fairly rapidly to rather sizable numbers in future years. Of secondary importance is the indication which these estimates give of the width of the range which may arise in actuarial estimates because of different possible assumptions as to the cost factors involved. An evidence of this is the 40-percent variation between the two 1985 estimates in table 6. Although at this time most population experts believe that future mortality will continue to improve, a rapid leveling off or even an increase in mortality is not impossible. To be conservative, the actuary should therefore always make several estimates using different cost factors which represent a reasonable possible range.

<sup>3</sup> Under the original act all individuals with 1937 wage credits would have received, after attainment of age 65, either a lump-sum payment or a monthly benefit upon retirement from regular employment. The 1939 amendments do not provide any primary monthly benefit or lump-sum benefit for persons over age 65 unless they meet the necessary wage and service requirements.