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THE
REGISTRAR-GENERAL'S
STATISTICAL REVIEW
OF
ENGLAND AND WALES
FOR THE YEAR

1933

(New Annual Series, No. 13)

TEXT

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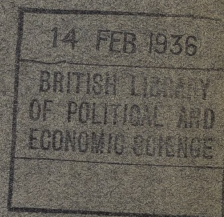
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STATISTICAL REVIEW, 1933.

Note.—Of the tables referred to below, those numbered in Arabic will be found in "Tables, Part I—Medical," and those lettered in "Tables, Part II—Civil," while those numbered in Roman numerals appear in the text of this volume.

DEATHS.

The deaths of 496,465 persons were registered in England and Wales during 1933, 250,625 of these being males and 245,840 females.

This number is 2·5 per cent. above that for 1932.

Deaths of non-civilians, which numbered only 377, are now allocated to their administrative area of residence, and are included in all 1933 tables.

Death-Rate.—The 496,465 deaths correspond to a rate of 12·3 per 1,000 of the estimated population. When standardized* to correct for the deviation of the sex and age distribution of the population, as shown in Table XIX, from that of the standard population of 1901, this death-rate is reduced to 9·8.

As the population of this country in 1901 included relatively few infants and old people it forms a standard exceptionally favourable to low mortality. Its use for this purpose accordingly yields comparatively low standardized rates all round. In order to correct any wrong impression which might arise from this fact, and to provide standardized rates for this country comparable with those of countries using the standard recommended by the International Statistical Institute (a composite population made up of those of a large number of European countries in 1900 or 1901), rates calculated upon the latter by the method suggested by the Institute† are shown in Table XIX, as well as those based on the 1901 English standard, which is that always used elsewhere in this Review. It will be seen that use of the less favourable standard increased the rate from 9·8 to 11·0 per thousand.

The rate of 9·8 per 1,000 is seen from Table 3 (Part I) to be only 0·2 above that for 1930 which is the lowest recorded, and is below the standardized rate of 10·3 for the quinquennium 1926-30.

When compared with 1932 the rates were higher at every age shown in Table XIX, except for children under 5 and males aged 65-75 and over 85 years. For most causes of death the stand.

* The term "standardized death-rate" means the death-rate corrected for differences of sex and age constitution of the population. For a full description of the methods employed for this "standardization" see The Registrar-General's Decennial Supplement—1921, Part III (pages xxxiii—xlii). Standardized death-rates for the sexes separately quoted in this Review are based upon the age distribution of persons of undistinguished sex in the general population of England and Wales in 1901.

† *Annuaire International de Statistique*, 1917, p. viii.

ardized rates in Table 8 were below the average for the preceding five years, the comparison on this basis being specially favourable for measles, whooping cough, diphtheria, encephalitis lethargica, respiratory diseases, tuberculosis, valvular disease of the heart, chronic nephritis and cirrhosis of the liver, and for general paralysis and hernia in males. The causes which showed appreciable increases over the preceding five-year average were influenza, scarlet fever, cerebro-spinal fever, acute poliomyelitis, erysipelas, carbuncle and boil, diseases of the nasal sinuses, ear and mastoid, malignant endocarditis, myocardial degeneration; angina pectoris, in both sexes, and diabetes, pernicious anæmia, leukæmia, appendicitis and peritonitis in females.

Mortality at different portions of the year.—Table 4 indicates that the crude death-rate was below the corresponding rate in the decade 1921-30 for the June and September quarters, but was higher than in the preceding three years in the March quarter and higher than in the preceding six years in the December quarter. Table 31 shows that both the second and third quarters were unusually warm when judged by the mean air temperature at Greenwich, the former being the warmest since 1893 and the latter since 1911.

The contributions of the four quarters to the year's mortality in quinquennial periods since 1851, and in 1931, 1932 and 1933, are shown in Table I. It should be noted, however, that the crude quarterly mortalities in Tables 1 and 4 do not represent the full improvement which would be registered since 1901 if these rates were standardized.

The March quarter of 1933 was characterised by an influenza epidemic similar in extent to that of 1927, that is to say, causing greater mortality assigned to that cause than in any year since 1919, with the single exception of 1929.

The percentage contribution of the March quarter to the year's mortality, which has shown a progressive increase since 1896-1900, was lower in 1933 than in the years 1927 and 1929, but it exceeded the average figure for any quinquennium in the table.

The present stability of the death-rate in the last three quarters of the year is more apparent from the experience during the last ten years (Table 4). The average mortality in these quarters during the decennium ranged only from 10.7 to 11.4, while the death-rate in the March quarter fluctuated between 13.4 in 1930, and 20.9 in 1929, an influenza year when the first quarter was exceptionally cold. So long as these tendencies continue, the mortality experienced in the March quarter virtually determines the death-rate for the year.

The numbers of deaths from different causes which occurred in each of the first nine months of the year are set out in Table 23.

Mortality of each sex.—The excess of male over female mortality in 1933 was 24 per cent., compared with 26 in 1931 and 25 in 1932. Comparing the sex rates age by age, male excess occurred at each

age group, this excess being greater, except at ages 25-45 and 65-75, than in either of the quinquennia 1921-5 or 1926-30. These changes recorded in Table II are derived from Table 5, with substitution for 1911-15 and 1916-20 of rates based on total male population and deaths registered in this country for those in Table 5, which refer to civilian males only.

Table I.—Quarterly Death-rates in each quinquennium 1851-1930 and in 1931, 1932 and 1933 with ratio to yearly rate taken as 100.

	Death-rate per 1,000 living.				Ratio to yearly rate taken as 100.			
	March.	June.	September.	December.	March.	June.	September.	December.
1851-55	25.3	22.5	21.0	21.9	111	99	93	96
1856-60	24.1	21.6	19.6	21.9	111	99	90	100
1861-65	25.7	22.0	20.4	22.3	114	97	90	99
1866-70	24.7	21.6	21.5	22.0	110	96	96	98
1871-75	24.3	21.1	20.4	22.1	110	96	93	100
1876-80	23.2	20.7	18.8	20.6	112	100	90	99
1881-85	21.4	19.3	17.6	19.4	110	99	91	100
1886-90	21.7	18.0	17.0	18.9	115	95	90	100
1891-95	21.8	18.5	16.4	18.1	117	99	88	97
1896-1900	19.5	16.6	17.5	17.2	110	94	99	97
1901-05	17.9	15.2	14.9	16.1	112	95	93	101
1906-10	17.4	14.1	12.6	14.7	118	96	86	100
1911-15	16.9	13.7	12.7	14.0	118	96	89	98
1916-20	17.5	13.5	10.9	15.8	122	94	76	110
1921-25	15.1	11.9	9.6	12.0	124	98	79	98
1926-30	15.9	11.5	9.4	11.6	131	95	78	96
1931	16.5	11.5	9.6	11.7	134	93	78	95
1932	15.4	11.6	9.7	11.5	128	97	81	96
1933	17.1	10.8	9.4	12.0	139	88	76	98

Table II shows that male excess is lowest at ages 10-15 for which age group a female excess was the rule until 1927. At 5-10 a small female excess during 1891-1910 has given place to a male excess of 10 per cent. or greater, and at 10-15 a similar reversal of the sex ratio has occurred since 1916-20. At 15-20 this took place at the end of last century. At 25-35, on the other hand, the male excess, after reaching a maximum in 1911-20, is declining.

In 1933 the maximum disparity in sex mortality is reached at ages 45-55, after which it decreases again with advancing age. Only in extreme old age has the female mortality not declined more than the male since the middle of last century.

The causes of death accounting for this large male excess may be gathered from Table 8, in which the mortality disadvantage of females arising from their greater age is neutralized by reference of the rates for both sexes to a common population basis.

The causes chiefly accounting for male excess, with the contribution of each to its total of 2,111 per million, are seen to be, in order of importance, accident (313), heart disease (280), pneumonia (260) tuberculosis (194), digestive diseases (177), and arterio-sclerosis (128). These causes jointly contribute 64 per cent. of the total male excess. The principal causes common to both sexes in Table 8, for which female standardized mortality exceeds that of males, are, in order of numerical importance, mitral or unspecified valvular disease, rheumatoid and osteo-arthritis, whooping cough, diabetes, non-malignant tumours, gall stones, other diseases of the liver and gall bladder (not cirrhosis) and pernicious anæmia.

Table II.—Mortality of Males per cent. of that of Females at Various Ages from 1841-45 onwards. (See Table 5.)

	All Ages Standard- ized.	0-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85- and up- wards
1841-45	109	117	102	92	88	105	95	101	114	111	111	109	106
1846-50	108	116	103	95	91	104	94	99	113	112	111	109	107
1851-55	110	116	104	98	90	103	97	102	118	114	112	110	106
1856-60	109	115	99	96	90	102	96	103	118	115	111	108	107
1861-65	111	115	102	98	93	105	100	109	122	118	112	109	110
1866-70	113	115	107	100	94	106	105	113	124	120	115	109	111
1871-75	115	117	108	100	97	109	109	119	128	121	114	111	110
1876-80	116	118	107	97	96	108	109	119	129	122	114	112	111
1881-85	115	118	102	97	96	102	104	117	127	122	116	113	112
1886-90	116	119	100	97	98	106	107	117	129	122	117	112	114
1891-95	118	119	98	96	100	108	108	118	128	121	115	111	110
1896-00	118	118	98	96	106	120	116	122	129	124	117	113	109
1901-05	119	119	97	95	107	119	118	121	130	128	119	115	110
1906-10	120	119	97	95	107	121	118	121	129	128	121	115	113
1911-15	122	120	100	95	111	122	124	126	132	133	124	118	115
1916-20	124	121	100	92	114	122	124	131	135	137	132	121	111
1921-25	122	124	104	100	100	113	114	130	132	133	127	119	110
1926-30	124	125	110	105	106	108	112	134	140	136	130	121	107
1924 ..	122	122	109	94	100	110	111	130	134	132	127	119	109
1925 ..	123	124	104	100	104	106	115	131	135	135	129	121	108
1926 ..	123	124	109	100	104	107	112	133	135	134	129	123	111
1927 ..	123	125	109	107	104	110	112	135	137	134	129	120	108
1928 ..	125	126	109	113	108	103	112	130	138	136	130	123	110
1929 ..	122	122	113	100	108	110	111	139	143	134	126	117	103
1930 ..	127	128	110	104	109	112	111	133	144	139	133	121	103
1931 ..	126	128	115	100	108	114	106	129	140	135	132	121	111
1932 ..	125	125	116	108	114	114	110	123	135	137	134	123	110
1933 ..	124	126	110	107	113	114	109	124	141	137	129	122	110

Infant Mortality.

Of the 496,465 deaths registered during the year, 36,960, or 7.4 per cent., were those of infants under one year of age.

The rate of infant mortality resulting from these deaths is 64 per 1,000 live births; this rate is 1 per 1,000 below that of the previous year but 4 per 1,000 above the lowest rate recorded, that of 1930.

The rates in the four quarters of the year were 84, 53, 49 and 69 respectively, being lower in the first three quarters and higher in the December quarter than in 1932.

Table III traces the changes in the quarterly incidence of infantile mortality during the last 63 years, and shows, in conjunction with Table I, that until 1901-05, and again, but to a very slight degree, in

1911-15, while the coldest months of the year yielded the highest general death-rate, the hot summer months levied the highest toll on infant life.

Since the beginning of the present century, this experience has undergone a remarkable change. In all four quarters, the infant death-rate has fallen in each successive quinquennium, but with great inequality. Comparing 1933 with 1896-1900, the fall ranges from 41 per cent. in the March quarter, 53 in the December, and 57 in the June, to 77 per cent. in the September quarter. This precipitate decline, due in a large measure to the fall in the mortality from epidemic diarrhoea, has so reduced the mortality in the third quarter that it now yields the lowest quarterly rate, while the March quarter yields the highest.

Table III.—Average Rate of Infantile Mortality by Quarters in Quinquennia, 1871-1930, and in 1931, 1932, and 1933.

	Yearly Average.	Quarterly Averages.			
		March.	June.	September.	December.
1871-75 ...	153	151	133	180	149
1876-80 ...	145	147	128	161	143
1881-85 ...	139	140	125	152	139
1886-90 ...	145	146	125	163	147
1891-95 ...	151	151	132	169	151
1896-1900 ...	156	142	124	212	148
1901-05 ...	138	137	113	162	140
1906-10 ...	117	124	98	120	128
1911-15 ...	110	119	91	120	109
1916-20 ...	90	116	83	75	91
1921-25 ...	76	94	70	62	77
1926-30 ...	68	91	60	52	69
1931 ...	66	94	59	46	67
1932 ...	65	88	59	50	65
1933 ..	64	84	53	49	69

The changes in the infant mortality rate from all causes and from diarrhoeal diseases since 1861-65 are shown in Table IV. The diarrhoeal rate for 1933 is above that of the three preceding years and of 1922 and 1927 (*see* Table 12) but below that of any other year, notwithstanding that the September quarter was the warmest since 1911 when judged by the mean air temperature at Greenwich. Further reference to this is made on p. 23.

Table V shows that the fall during the five quinquennia for which detailed age distinction is now available was continuous at every age-group except 1-7 days, at which age the rate in 1926-30 was slightly in excess of that for the preceding five years. During the first month of life the fall was 21 per cent., but at the later age-groups the average fall was slightly over 50 per cent., reaching a maximum of 56 per cent. at 3-6 months. At ages from 1 week upwards a further

10.7 per 1,000 live births less than in the Administrative County. The only region showing a lower rate than this was the surrounding area of South-East England outside Greater London.

It has been noticed almost invariably since 1911 that the Northern county boroughs have had the highest and the rural districts of the South the lowest infant mortality rate, and it was pointed out in Table XXI of the Review for 1931 (Text, p. 27) that when the twelve regional aggregates in use prior to 1931, apart from London, were arranged in order of the mean number of persons per room in 1931, the rates for 1926-30 almost followed the same order.

Table VI.—Distribution of Infant Mortality, 1933.

	Deaths per 1,000 (Live) Births.				Mortality per cent. of that in England and Wales.		Deaths per 1,000 (Live) Births.				Mortality per cent. of that in England and Wales.
	Males.	Fe-males.	Both Sexes.	Both Sexes.			Males.	Fe-males.	Both Sexes.	Both Sexes.	
England and Wales	71.8	55.2	63.7	100							
South-east	58.4	44.1	51.4	81	East	60.1	44.2	52.3	82		
Greater London	61.3	46.7	54.2	85	South-west	56.8	41.9	49.5	78		
Remainder of	53.9	40.2	47.2	74	Wales	82.9	65.1	74.2	116		
South-east ..					Wales I	87.5	67.8	77.9	122		
North	85.2	66.0	75.9	119	Wales II	69.3	56.5	63.2	99		
North I	88.0	70.2	79.4	125	County Boroughs*	84.3	65.0	74.9	118		
" II	79.4	60.8	70.4	111	Other Urban Districts*	70.6	53.5	62.3	98		
" III	80.4	62.9	71.8	113	Rural Districts*	62.9	49.4	56.3	88		
" IV	88.1	67.2	77.9	122	Greater Admin. Co.	66.8	52.0	59.5	93		
Midland	73.1	57.0	65.2	102	London { Outer Ring	55.9	41.3	48.8	77		
Midland I .. .	72.9	58.3	65.7	103							
" II	73.5	54.5	64.2	101							

* Excluding Greater London.

In Table VII of the Review for 1932 it was further shown that when the county boroughs and county aggregates of urban and rural districts were grouped according to their mean densities per room, the infant mortality rates in 1930-32 increased regularly with the density. Thus whilst county boroughs with mean densities less than 0.7 persons per room had an average rate of 57.6 per 1,000 births, those with densities exceeding 1.15 per room had an average rate of 92.7. A similar progression was evident for the county aggregates, but for the Metropolitan boroughs the increase was only noticeable for those with mean densities exceeding 1.3 persons per room. It must be remembered, however, that the mean density per room tends to increase from South to North, as indicated in Table VII of this Review where the county boroughs have been grouped according to the zones of latitude in which they are situated and also according to the percentage of the populations in private families who were living more than two per room in 1931.

The rates progressively increase as the measure of overcrowding rises within each latitude zone. A low average density of occupation of houses as measured by the number of rooms and persons, with all that is implied by that in social well-being, is clearly conducive to a

Table VII.—Infant Mortality, 1933, in the County Boroughs grouped according to their Latitude and proportions of their populations living in overcrowded conditions in 1931. (1930-32 rates in parentheses).

Grouping by per cent. of population living at density of more than 2 per Room.	Degrees of North Latitude.						
	50°-	51°-	52°-	53°-	54°-	55°-	All.
Infant Mortality (all Causes) per 1,000 Live Births.							
0-	52.5	45.7	62.3	64.3	—	—	57.9 (57.1)
3-	52.3	59.4	70.0	71.6	—	—	63.9 (62.5)
6-	—	67.4	69.7	73.3	64.5	—	71.6 (72.3)
9-	57.9	—	86.2	94.0	73.8	—	89.5 (84.5)
12-	—	—	101.6	89.0	91.4	—	91.6 (85.1)
15 and over ..	—	64.5	—	115.5	82.0	86.3	81.7 (81.6)
All County Boroughs ..	53.5	60.7	70.3	81.2	81.7	86.3	73.9 (72.6)
Infant Mortality (Congenital Causes) per 1,000 Live Births.							
0-	35.3	26.7	30.9	35.2	—	—	31.5 (30.6)
3-	28.9	32.7	35.2	37.1	—	—	33.8 (31.9)
6-	—	31.1	35.3	35.2	34.6	—	34.9 (33.4)
9-	34.0	—	43.6	39.3	37.5	—	38.9 (34.6)
12-	—	—	37.9	45.9	41.4	—	43.4 (38.0)
15 and over ..	—	29.1	—	47.4	36.3	38.7	35.9 (33.1)
All County Boroughs ..	30.8	31.4	34.9	37.6	37.0	38.7	35.6 (33.2)
Infant Mortality (other Causes) per 1,000 Live Births.							
0-	17.2	19.0	31.4	29.1	—	—	26.4 (26.5)
3-	23.4	26.7	34.8	34.5	—	—	30.1 (30.6)
6-	—	36.3	34.4	38.1	29.9	—	36.7 (38.9)
9-	23.9	—	42.6	54.7	36.3	—	50.6 (49.9)
12-	—	—	53.7	43.1	50.0	—	48.2 (47.1)
15 and over ..	—	35.4	—	68.1	45.7	47.6	45.8 (48.5)
All County Boroughs ..	22.7	29.3	35.4	43.6	44.7	47.6	38.3 (39.4)
Mean No. of Persons per Room (Private Families).							
All County Boroughs ..	.78	.84	.80	.88	1.09	1.08	.86

low infant mortality rate, and vice versa. At the same time this can account only in part for the northward increase, since in passing from the south coast zone to the industrial north (between 53° N and 55° N) the rates tend in general to rise within each group of towns whether characterised by a high or low percentage of overcrowding. It must be presumed therefore that northerliness is a factor of importance in its effect on infant mortality apart from housing density.

The lower part of Table VII shows that when mortality during the first year of life attributed to congenital causes (Nos. 157-161 of the International List) is separately analysed, the increase with overcrowding within each latitude zone was, in 1933, rather less evident than the increase from South to North in towns of similar overcrowding index. In 1930-32 (see Table VIII, 1932 Review) the former increase was scarcely evident at all. For mortality from causes other than congenital, however, the increase of mortality with overcrowding at a given latitude is very pronounced, as in 1930-32.

In the Review for 1932 (Table IX and p. 12) it was shown that the mean infant mortality rates of the 6 regions for 1931 and 1932 from causes described as premature birth and injury at birth followed the inverse order of the annual hours of sunshine recorded within those regions, and it was suggested that in so far as climate affects infant mortality at all, deficiency of effective solar radiation is probably a more important factor than the greater coldness of the northern towns.

Comparison of the rates in Table VII with the corresponding rates for the preceding triennium indicates that, whilst causes other than congenital showed no important differences, the 1933 mortality attributed to congenital causes was enhanced at all latitudes, and in every compartment of the table except two, the increase being greatest, however, in the towns with high indices of overcrowding, as may be seen by comparing the rates in the last column of the table with the corresponding rates for 1930-32, given in parentheses.

Table VI shows that in 1933 North I gave the highest rate of 79.4 per 1,000 births, this rate being 125 per cent. of the rate in England and Wales. North IV and Wales I followed with 122 per cent., North III with 113, and North II with 111. The Greater London rate was only 85 per cent. of that in England and Wales, that of the Eastern Counties 82, of the South-West 78, and of the South-Eastern region outside Greater London 74.

Compared with the preceding year Greater London, the South East, South West and North III showed substantially lower rates, whereas in Wales I mortality was considerably higher.

The extent of the fall in infant mortality in 1933 below the 1916-20 standard was 34 per cent. in London Administrative County, 28 per cent. in the North, 29 per cent. in the rest of England and 19 per cent. in Wales. Adhering to the density classification hitherto used, it is seen from Table VIII that the

Table VIII.—Infant Mortality at Various Stages of Infancy in different Classes of Area compared with that in 1911-15 and 1926-30.

	Under 4 Weeks.				4 Weeks to 3 Months.				3-6 Months.			
	Mortality (per 1,000 Live Births) compared with 1911-15 taken as 1,000.											
	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.
1911-15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1916-20	949	943	940	971	834	810	790	834	793	739	691	726
1921-25	800	855	862	871	574	640	627	672	605	604	550	577
1926-30	728	812	823	841	505	548	507	582	539	516	430	480
	Mortality (per 1,000 Live Births) compared with 1926-30 taken as 1,000.											
	Greater London.				Greater London.				Greater London.			
	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.
1926-30	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1926	1,002	1,013	1,003	978	1,029	1,079	1,083	1,069	1,044	1,080	1,129	1,089
1927	993	1,018	1,032	1,005	889	976	1,025	1,070	931	1,004	1,087	1,050
1928	994	985	967	965	1,068	978	966	928	1,059	971	888	934
1929	1,041	1,020	1,027	1,060	1,091	1,041	1,070	1,088	1,094	1,117	1,134	1,115
1930	969	964	971	995	922	921	852	837	870	825	754	805
1931	1,017	981	989	1,010	1,075	993	1,003	937	1,037	980	946	910
1932	1,028	988	990	984	1,025	1,011	963	1,004	1,017	930	925	983
1933	1,041	1,007	1,003	1,016	869	938	906	927	891	956	905	854
	6-9 Months.				9-12 Months.				Total under 1 Year.			
Mortality (per 1,000 Live Births) compared with 1911-15 taken as 1,000.												
London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	London Admin. County.	County Boroughs.	Other Urban Districts.	Rural Districts.	
1911-15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1916-20	735	729	685	739	738	732	701	736	833	818	800	851
1921-25	578	604	568	583	592	643	573	602	655	700	683	721
1926-30	546	517	463	506	529	550	478	535	592	626	598	659
Mortality (per 1,000 Live Births) compared with 1926-30 taken as 1,000.												
	Greater London.				Greater London.				Greater London.			
	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Greater London.
1926-30	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1926	950	1,096	1,087	1,073	1,004	1,038	1,037	1,000	1,007	1,047	1,045	1,017
1927	954	1,059	1,110	1,154	921	1,094	1,172	1,188	952	1,024	1,062	1,052
1928	1,040	883	880	851	1,039	885	836	874	1,028	956	933	936
1929	1,213	1,254	1,185	1,186	1,209	1,280	1,241	1,182	1,100	1,100	1,088	1,094
1930	849	707	736	729	830	703	714	756	913	871	872	900
1931	902	992	917	973	817	936	925	908	991	978	971	974
1932	915	897	824	925	937	791	795	910	1,060	947	938	974
1933	759	884	821	829	691	832	789	829	910	951	932	948

fall from 1911-15 to 1926-30 amounted to 41 per cent. in London, 37 per cent. in the county boroughs, 40 per cent. in the small towns and 34 per cent. in the rural districts. The 1933 rates showed a further improvement on 1926-30 rates amounting to 5 per cent. in the county boroughs, 7 per cent. in the small towns and 5 per cent. in the rural districts, Greater London being excluded in each case.

Distribution of the Fall in Mortality at Various Stages of Infancy.—The reduction of mortality at various stages of infancy in different classes of area is outlined for the period covered by this form of tabulation in Table VIII.

In this table the comparison with 1911-15 is shown up to 1926-30 on the basis of the division previously used, that is to say the aggregates referred to, other than the Administrative County of London, include in each instance some districts comprising London's outer ring, but from 1926-30 onwards the new density summary is used. It was pointed out in the Review for 1931 (p. 10) that the effect of the change on infant mortality rates is only of importance for the "other urban districts," the new aggregate having rates higher than the old, in 1931, by 5 per cent. for the first 4 weeks of life, 3 per cent. at 1-6 months, 8 per cent. at 6-9 months, 7 per cent. at 9-12

Table IX.—Infant Mortality (per 1,000 Live Births) at Various Stages of Infancy in Different Regions of England and Wales, per 1,000 of that in 1916-20.

	Under 4 Weeks.				4 Weeks to 3 Months.				3-6 Months.			
	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.
	1911-15	1,053	1,032	1,074	1,051	1,232	1,194	1,262	1,310	1,370	1,322	1,425
1916-20	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1921-25	902	915	898	928	782	813	771	826	799	812	789	850
1926-30	889	871	855	952	660	687	650	699	665	673	657	695
1931	853	854	854	971	660	696	632	709	647	672	621	642
1932	853	853	858	953	660	704	633	644	634	642	620	624
1933	870	865	873	1,003	604	640	581	716	609	658	555	670

	6-9 Months.				9-12 Months.				Total under 1 Year.			
	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.	England and Wales.	North.	Rest of* England.	Wales.
	1911-15	1,392	—	—	—	1,380	—	—	—	1,218	1,187	1,242
1916-20	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1921-25	818	834	798	862	842	876	798	909	846	864	836	886
1926-30	698	691	700	719	721	737	716	710	755	764	755	808
1931	666	691	633	696	655	711	613	779	738	756	727	814
1932	619	596	635	600	602	581	613	596	723	723	729	759
1933	584	594	578	658	573	593	577	650	708	720	705	814

* Excluding London Administrative County.

months and 5 per cent. for the first year as a whole. This effect, however, is eliminated in Table VIII by the change of datum line at 1926-30.

In Greater London and each class of area 1933 rates show improvement over 1926-30 at each group of ages over 4 weeks. In the towns the degree of recent improvement progressively increases from 3 months onwards.

Table IX compares the extent of decline since 1916-20 at different stages of infancy in the North and in Wales with that in the rest of England, excluding London Administrative County. Mortality during the first 4 weeks has fallen to the same extent in the North as in the rest of England, by 13 per cent., but in Wales the improvement up to 1921-25, has not been maintained in more recent years.

In the second and third months the rates were lower in 1933 than in 1926-30 in the English divisions but not in Wales. At 3-12 months they were lower throughout, but the Welsh rates were considerably above the low levels attained in 1932.

The analysis of infant deaths by detail of age, initiated in 1905 with distinction of registration counties mainly urban and mainly rural in character, and expanded in 1917 and again in 1931, is given for each region and class of area in Table 13. Distinctions of sex and legitimacy are shown only for England and Wales as a whole, but are available for each of the populations dealt with. Some of the facts and rates applying to the illegitimate will be found in Table 14. The rates per 1,000 live births appear in Table X, and as percentages of the England and Wales rate in Table XI.

The chance of dying within half an hour of birth reached 2 per 1,000 in North II, Midland I and London, and was lowest in the East. This measure is very dependent upon accuracy of certification which in turn may be correlated with the frequency of the presence of a medical attendant at the birth. When the mortality within the first day as a whole is examined, Wales gives, as in each year since 1927, the highest rate of any of the large regions, the sequence being then as usual from North to South. For the combined mortality from the second to the seventh day Wales II shows the highest rate, 124 per cent. of the rate for England and Wales, closely followed by North I and Wales I, whilst London gives the lowest ratio, 74 per cent. North I gives the highest rates from the 3rd week to the 9th month, and North IV at 9-12 months. The South-West and South-East outside Greater London give the lowest rates after 3 months. The range of relative mortality increases from 86-119 per cent. of that of England and Wales for the first day's mortality, to 55-144 at 3-6 months, 59-141 at 6-9 months, and 57-142 at 9-12 months. In 1931 the regional range was greatest at 9-12, and in 1932 at 6-9 months.

Urban excess is not, as a rule, present from birth, but tends to increase throughout the later months of infancy. This is well shown in 1933 by contrasting London Administrative County with

its outer ring of suburbs. At 1-7 days and in the 2nd, 3rd and 4th weeks the rate was actually higher in the outer ring, but at 4 weeks to 3 months the rate for the outer ring was only 78 per cent. of that for London itself, and at 3-12 months less than 65 per cent. Outside Greater London the rates during the first few weeks are only slightly affected by urbanization, but the divergence between the county boroughs and rural districts rapidly increases to 62 per cent. of the rate for England and Wales at 3-6 months, 57 per cent. at 6-9 months and 60 per cent. at 9-12 months.

Table XII.—Mortality of the first 30 Minutes of Life 1933.

International List Numbers.	Cause of Death.	Under 30 Minutes.						
		All Infants.	Legitimate.			Illegitimate.		
			Males.	Fe-males.	Both Sexes.	Males.	Fe-males.	Both Sexes.
Deaths.								
86	Convulsions	—	—	—	—	—	—	
157	Congenital malformations	78	23	48	71	3	7	
158	Congenital debility	27	15	8	23	1	4	
159	Premature birth	404	199	172	371	19	33	
160	Injury at birth	165	78	70	148	7	17	
161 (a)	Atelectasis	117	63	45	108	6	9	
161 (b&c)	Other diseases peculiar to early infancy	9	2	5	7	—	2	
194: 1	Lack of care	141	15	13	28	55	113	
182	Accidental suffocation	3	1	—	2	1	1	
172-175	Homicide	19	—	—	—	9	19	
	Other forms of violence	32	—	3	3	14	29	
	Violence and lack of care	195	16	17	33	79	162	
	Other Causes	18	3	1	4	7	14	
	All Causes	1,013	399	366	765	122	248	
Mortality per Million Live Births.								
86	Convulsions	—	—	—	—	—	—	
157	Congenital malformations	134	81	177	128	234	276	
158	Congenital debility	47	53	30	41	78	157	
159	Premature birth	696	701	634	668	1,480	1,299	
160	Injury at birth	284	275	258	267	545	669	
161 (a)	Atelectasis	202	222	166	195	457	239	
161 (b&c)	Other diseases peculiar to early infancy	16	7	18	13	—	79	
94: 1	Lack of care	243	53	48	50	4,284	4,447	
82	Accidental suffocation	5	4	4	4	78	39	
172-175	Homicide	33	—	—	—	701	748	
	Other forms of violence	55	—	11	5	1,090	1,141	
	Violence and lack of care	336	56	63	59	6,152	6,376	
	Other causes	31	11	4	7	545	551	
	All Causes	1,745	1,405	1,350	1,378	9,502	9,761	
Percentage of Total under 24 Hours.								
86	Convulsions	—	—	—	—	—	41	
157	Congenital malformations	20	13	24	19	33	29	
158	Congenital debility	11	11	8	10	17	11	
159	Premature birth	9	9	10	9	12	11	
160	Injury at birth	30	26	33	29	41	33	
161 (a)	Atelectasis	20	20	20	20	46	21	
161 (b&c)	Other diseases peculiar to early infancy	24	11	31	21	—	50	
194: 1	Lack of care	88	79	87	82	87	90	
182	Accidental suffocation	18	11	20	14	100	33	
172-175	Homicide	86	—	—	—	82	90	
	Other forms of violence	89	—	100	100	88	88	
	Violence and lack of care	83	57	71	63	87	89	
	Other causes	31	10	8	10	88	88	
	All Causes	16	12	15	13	40	41	

Comparison of Table X with 1932 reveals increases in the rates for the first month of life in each region except North II, III, decreases at the 2nd and 3rd months except in Midland I and Wales, decreases at 3-6 months except in North I, II, III and Wales I, and decreases at 6-9 months except in North I and II, South West and Wales I. At 9-12 months there were increases in North I, II, IV, Midland II, East and Wales I, but decreases elsewhere.

Deaths occurring immediately after birth.—The separate tabulation of deaths registered as occurring within 30 minutes of birth according to sex, cause and legitimacy, first published in the Review for 1928, is repeated for 1933 in Table XII.

The table shows that this very early mortality displays in 1933 the same startling differential incidence upon the illegitimate as in previous years, especially for those causes of death which imply, or are likely to mask, violence or neglect. For violence and lack of care as a whole a rate of 6,376 per million for illegitimate infants compares with one of 59 for the legitimate; 83 per cent. of all such deaths under 24 hours occurred within this first half hour, as against 16 per cent. for mortality generally, so that the risk represented by violence and lack of care is one applying especially to this first half-hour of life. The rate of mortality among legitimate infants from all causes in 1933 was 1,405 per million live born males and 1,350 for females, the corresponding rates in the preceding 5-year period being 1,419 and 1,224 respectively. Comparison with the preceding years reveals a progressive increase since 1929 in deaths of female infants during the first half-hour attributed to congenital malformations, but no corresponding rise for male infants. Thus in 1931-33, 131 legitimate female infants died from congenital malformations in the first half hour compared with 85 in the preceding triennium, the corresponding totals for males being 74 and 86. On the other hand, male deaths attributed to injury at birth have increased, whereas those of female infants have decreased. The rates per million live births in each triennium 1928-30 and 1931-33 from various causes are given below. They show that atelectasis has also increased for infants of both sexes as a stated cause of death.

Legitimate Infants.	Males.		Females.	
	1928-30.	1931-33.	1928-30.	1931-33.
	Congenital malformations	90	83	93	154
Congenital debility	87	85	62	56
Premature birth	700	715	583	570
Injury at birth	262	297	235	211
Atelectasis	148	192	145	161
Other diseases of early infancy	7	8	3	11

Of the 162 deaths of illegitimate infants assigned to violence and lack of care 107 or 66 per cent. relate to abandoned infants of unknown parentage.

Causes of Infant Mortality.—The causes of infant mortality are set forth in Tables 11–15, which compare the records of 1933 with those of previous years, and show the incidence of mortality from each cause upon infants distinguished by sex, age, legitimacy, class of area, and section of the country. From these tables has been prepared the comparison in Table XIII between the mortality from the chief causes distinguished at various ages in 1933 and 1928–32, and from all causes in 1933 and 1932.

Table XIII.—Comparison of Infant Mortality Rates (per 100,000 Live Births) in 1933 with those of immediately preceding years.

	Increase or Decrease from Various Causes as compared with 1928–32.					Percentage Increase or Decrease as compared with 1928–32.						
	Under 4 Weeks.	4 Weeks to 3 Months.	3–6 Months.	6–9 Months.	9–12 Months.	Under 1 Year.	Under 4 Weeks.	4 Weeks to 3 Months.	3–6 Months.	6–9 Months.	9–12 Months.	Under 1 Year.
Measles (7) ..	—	-1	-7	-15	-35	-57	—	-33	-78	-42	-49	-47
Whooping cough (9) ..	+2	-12	-12	-23	-13	-59	+40	-27	-23	-37	-20	-25
Influenza (11) ..	+3	+5	+4	+7	+7	+24	+50	+42	+27	+44	+47	+37
Tuberculosis, all forms (23–32)	-1	-2	-5	5	6	18	-29	-19	-15	-18	-18	-18
Convulsions (86) ..	-18	-13	-7	-3	6	45	-15	-30	-23	-14	-40	-19
Bronchitis and pneumonia (106–109) ..	-14	-36	-34	-56	-43	-183	-11	-12	-10	-17	-15	-13
Diarrhoea and enteritis (119)	-10	+3	+12	+5	+4	+15	-17	+2	+6	+4	+6	+3
Developmental and wasting diseases (157–159, 161 a, b)	+103	-3	+2	—	+2	+105	+4	-1	+2	—	+10	+4
Congenital defects (malformations and atelectasis) (157, 161a)	+52	+11	+7	+4	+4	+78	+11	+9	+14	+19	+33	+11
Congenital debility and icterus (158, 161b)	-23	-9	-6	-2	-2	-42	-9	-10	-13	-15	-29	-10
Premature birth (159) ..	+75	+5	+1	-1	—	+69	+5	-3	+7	-50	—	+4
Injury at birth (160) ..	+18	—	+1	+1	+1	+19	+9	—	—	—	—	+9
Suffocation—in bed or not stated how (182 part) ..	-6	-4	—	+1	—	-9	-27	-25	—	+33	—	-17
Other causes..	-17	-13	—	+2	-9	-39	-7	-10	—	+2	-8	-5
All Causes ..	+61	-78	-47	-86	-97	-247	+2	-7	-5	-11	-14	-4
	Increase or Decrease of Mortality in 1933 as compared with 1932.					Increase or Decrease of Mortality in 1933 per cent. of that in 1932.						
All Causes ..	+62	-91	-37	-40	-30	-136	+2	-8	-4	-6	-5	-2

Note.—The percentages in this Table being based on rates per 100,000 live births may differ on this account from those derivable from the rates in Table V.

* Numbers too small to provide significant comparison.

The decrease from the previous year is seen to have applied to each period of age subsequent to the first month, which showed a slight increase. The same is true when comparison is made with the average rates for the preceding five years. Mortality of infants from influenza, diarrhoea and congenital defects increased at each age period, however, the first being attributable to the severe epidemic in the first quarter of 1933, and the second to the hot summer. Deaths attributed to congenital defects and injury at birth per 1,000 live births have progressively increased since 1923, their rate in 1933 again being the highest recorded in Table 12.

Mortality from premature birth, which has since 1922 risen and fallen each year with the influenza rate, was higher than in any year since 1924. Arranging the 12 years 1922–33 in ascending order of their infant mortality from influenza, the following correspondence is found between the rates per 100,000 live births from these causes.

No. of years.	Influenza.	Premature Birth.
5	20 to 58	1749 to 1768
2	69, 81	1820, 1830
5	89 to 125	1855 to 1882

Notwithstanding the influenza epidemic, bronchitis mortality was the lowest recorded, and pneumonia the lowest except in 1921, 1923 and 1930. The measles rate was the lowest recorded except in 1921, and for whooping cough it was the lowest except in 1930 and 1919. Record low levels were also reached for tuberculosis of the nervous system, syphilis, convulsions, respiratory diseases other than bronchitis and pneumonia, inflammation of the stomach, pemphigus neonatorum, suffocation in bed and inattention at birth, out of the causes distinguished in Table 12.

The extent of the decline in infant mortality during the 20 years from 1912–14 to 1933 is analysed for the principal causes in Table XIV and the result is summarized in Table XV.

Table XIV.—Infant Mortality in 1933 per cent. of that in 1912–14, by cause, sex, age and legitimacy.

List No.	Cause	Under 1 month.	1–3 months.	3–6 months.	6–12 months.	Under 1 year.			
						Total.	Male.	Female.	Illegitimate.
7	ALL CAUSES ..	83	52	49	47	62	63	61	54
	Measles ..	23	41	13	26	25	26	24	27
9	Whooping Cough ..	61	43	44	44	44	44	44	37
10	Diphtheria and Croup ..	59	110	47	48	51	48	55	108
11	Influenza ..	248	246	281	417	321	325	316	?
15	Erysipelas ..	143	159	250	395	222	228	216	?
24	Tuberculosis of Nervous System ..	—	20	35	43	39	39	38	15
25	Tuberculosis of Intestines and Peritoneum ..	19	8	10	16	12	14	10	9
23, 26–32	Other tuberculous diseases ..	21	19	43	42	39	40	38	19
34	Syphilis ..	35	25	25	19	28	27	29	25
79	Meningitis ..	47	38	31	27	30	35	24	23
86	Convulsions ..	32	16	15	15	22	23	21	17
106	Bronchitis ..	41	34	34	27	32	32	32	31
107–109	Pneumonia (all forms) ..	145	109	100	76	91	93	88	85
	Other diseases of the Respiratory system ..	48	46	37	22	34	31	38	?
119–20	Diarrhoea and Enteritis ..	51	45	43	36	41	44	38	42
118 (1)	Inflammation of stomach ..	33	18	23	17	21	19	24	18
122	Hernia and Intestinal obstruction ..	124	67	106	121	110	108	114	?
157	Congenital Malformations ..	149	177	146	151	154	154	154	113
158	Congenital debility ..	30	26	23	14	26	27	25	?
159	Premature birth ..	96	89	70	43	95	95	94	99
160	Injury at Birth ..	195	223	—	—	196	198	194	112
161 (a)	Atelectasis ..	111	58	—	—	108	110	105	89

The risk of dying in the first month of life has fallen by 17 per cent., in the next two months by 48 per cent., at 3-6 months by 51 per cent., at 6-12 months by 53 per cent., or within the first year by 38 per cent. When the causes are considered separately

Table XV.—Change from 1912-14 to 1933 in Infant Mortality assigned to Various Causes.

Amount of change.		DECREASE, probably attributable to		
Per cent. of 1912-14.	Per 1,000 live births.	A. Improved hygiene, biological changes and preventive measures.	A and B combined.	B. Changes in terminology and medical certification.
- 88	- 1.0	—	Tuberculosis of intestines, etc.	—
- 79	- 1.2	—	—	Inflammation of stomach.
- 78	- 6.7	—	Convulsions.	—
- 75	- 1.9	Measles.	—	—
- 74	- 8.7	—	—	Congenital debility.
- 72	- 1.0	Syphilis.	—	—
- 70	- 0.9	—	—	Meningitis.
- 68	- 5.4	—	Bronchitis, Laryngitis, etc.	—
- 66	- 0.4	—	—	—
- 61	- 1.1	Tuberculous Meningitis, other tuberculosis.	—	—
- 59	- 8.7	Diarrhoea and enteritis.	—	—
- 56	- 2.2	Whooping cough.	—	—
- 49	- 0.1	Diphtheria.	—	—
NO APPRECIABLE CHANGE (10 per cent. or less).				
- 9	- 1.0	Pneumonia.	—	—
- 5	- 1.0	Premature birth.	—	—
+ 8	+ 0.1	Atelectasis.	—	—
+ 10	+ 0.1	Hernia and intestinal obstruction.	—	—
INCREASE.				
+ 54	+ 2.1	Congenital malformations.	—	—
+ 96	+ 1.1	Injury at birth.	—	—
+ 122	+ 0.2	Erysipelas.	—	—
+ 221	+ 0.6	Influenza.	—	—
- 38	- 39.0	ALL CAUSES combined.		

they fall into three distinct groups, (a) those showing a definite reduction in mortality under 1 year of age, ranging from 49 to 88 per cent. of the 1912-14 rate per 1,000 live births; (b) those showing no appreciable change, the rate in 1933 being within 10 per cent. of that 20 years earlier; and (c) those showing a definite increase ranging from 54 to 221 per cent.

Considering first the group of declining causes, tuberculous enteritis and peritonitis registers the greatest fall of 88 per cent., the real decline being probably obscured to some extent by changes in medical certification; inflammation of the stomach, congenital debility and meningitis owe most of their decline to the latter cause. In the case of bronchitis and laryngitis, transfer to pneumonia and diphtheria respectively has doubtless contributed to the decline of registered mortality, and more careful inquiry into deaths where

convulsions formed the terminal condition has led to assignment of many of these deaths to other causes. It should be pointed out, however, that in 1912-14 the three causes placed in column B of Table XV were responsible for a rate of 14.7 per 1,000 live births and that this fell by no less than 10.8 by 1933, of which fall 8.7 was due to congenital debility. The causes placed in the central column contributed a reduction of 13.5, so the amount of mortality transferred to other causes must presumably have been between 10 and 20 per 1,000 births.

Of the causes showing a definite increase over the rate of 20 years previously, influenza contributed an increase owing to the epidemic of 1933, no increase being noticeable in 1930. Congenital malformations and injury at birth were together responsible for a rise of 3.2 (from 5.0 to 8.2) in the rate, so only a small portion of the mortality supposed to have been transferred from "congenital debility" and other causes in the B column can have gone to these headings. The very large decline in congenital debility as a registered cause of death, if it does not represent a real change, must be accounted for by transfer to causes other than congenital malformations or injury at birth, thereby masking a part of the decline which has really taken place for some of those causes.

Table XVI.—Infant Mortality by Sex and Legitimacy, 1933.

	Deaths per 1,000 Live Births.						Mortality per cent.						
	All Infants.		Legitimate Infants.		Illegitimate Infants.		Male of Female Infants.		Illegitimate of Legitimate Infants.				
	Male.	Female.	Male.	Female.	Male.	Female.	All Infants.	Legitimate.	Illegitimate.	Male.	Female.		
All Causes.	Under four weeks ..	36.23	27.98	35.16	26.85	59.90	52.27	129	131	115	170	195	
	4 weeks-3 months ..	11.50	8.29	11.07	7.93	20.95	16.07	139	140	130	189	203	
	3-6 months ..	9.99	7.50	9.57	7.29	19.24	12.17	133	131	158	201	167	
	6-9 " ..	7.64	5.92	7.53	5.82	10.05	8.04	129	129	125	133	138	
	9-12 " ..	6.47	5.47	6.42	5.33	7.56	8.51	118	120	89	118	160	
	Total under 1 year	71.82	55.16	69.75	53.22	117.69	97.06	130	131	121	169	182	
	All Ages under one Year.	Measles (7) ..	0.67	0.57	0.67	0.55	0.70	1.11	118	122	63	104	202
		Whooping cough (9) ..	1.61	1.88	1.61	1.88	1.56	1.67	86	86	93	97	89
Tuberculosis, all forms (23-32) ..		0.95	0.70	0.97	0.69	0.55	1.03	136	141	53	57	149	
Syphilis (34) ..		0.43	0.36	0.37	0.26	1.87	2.55	119	142	73	505	981	
Convulsions (86) ..		2.21	1.51	2.16	1.47	3.27	2.39	146	147	137	151	163	
Bronchitis and pneumonia (106-109) ..		13.67	10.26	13.39	10.06	19.86	14.72	133	133	135	148	146	
Diarrhoea and enteritis (119) ..		7.25	4.96	6.79	4.67	17.29	11.30	146	145	153	255	242	
Developmental and wasting diseases (157-159, 161a & b)		33.66	26.44	32.95	25.65	49.54	43.60	127	128	114	150	170	
Congenital defects (malformations and atelectasis) (157, 161a) ..		8.68	6.77	8.69	6.77	8.49	6.84	128	128	124	98	101	
Congenital debility, sclerema and icterus (158, 161b)		4.30	2.95	4.16	2.82	7.24	5.57	146	148	130	174	198	
Premature birth (159)		20.69	16.73	20.09	16.06	33.80	31.19	124	125	108	168	194	
Other causes ..		11.37	8.48	10.84	7.99	23.05	18.69	134	136	123	213	234	
All causes ..		71.82	55.16	69.75	53.22	117.69	97.06	130	131	121	169	182	

Table XVI contrasts the mortality of male with that of female, and of legitimate with that of illegitimate, infants in 1933. The sex ratio of mortality, when compared with that of previous years (*see* Table XVI, Review for 1932), shows no unusual features. For the separate causes distinguished, other than whooping cough, male excess ranges from 18 per cent. for measles to 46 for diarrhoea, the congenital debility group and convulsions. The excess mortality of the illegitimate is, as usual, very much greater for syphilis than for any other cause distinguished in the table.

Distribution throughout the country of Infant Mortality from various causes.—Table XVII, which is derived from Table 15, furnishes an analysis by cause of the differences in total mortality under one year of age shown in Table VI.

Table XVII.—Comparison of Infant Mortality from the Principal Causes in Geographical Regions, 1933.

	Measles (7).	Whooping cough (9).	Tuberculosis, all forms (23-32).	Syphilis (34).	Convulsions (86).	Bronchitis and pneumonia (106-109).	Diarrhoea and enteritis (119).	Congenital malformations (157).	Congenital debility (158).	Premature birth (159).	Injury at birth (160).	Suffocation—in bed, or not stated how (182 pt.).	Other Causes.	All Causes.
Differences from Rates for England and Wales per 100,000 Live Births.														
South-East	-46	+12	-9	-7	-117	-414	-26	-69	-71	-379	-7	+2	-96	-1,227
Greater London	-44	+25	+3	-4	-135	-362	+188	-58	-89	-384	-13	-7	-71	-951
Remainder of South-East	-49	-9	-27	-13	-89	-494	-354	-86	-44	-371	+2	+14	-129	-1,649
North	+31	-8	+8	+7	+65	+405	+184	+35	+60	+259	+16	-2	+158	+1,218
North I	+35	-27	+18	+27	+184	+271	+457	-4	+111	+366	+2	-16	+145	+1,569
II	+5	+10	+57	+16	+93	+205	+121	-9	+79	+111	+43	+9	-31	+671
III	-17	-29	+2	+8	+23	+332	+54	+54	-29	+216	-	-	+17	+190
IV	+65	+8	+2	+2	+29	+549	+151	+52	+83	+271	+25	+9	+193	+1,417
Midland	+21	-28	+2	+9	+7	+99	-48	+17	+8	+136	-9	+3	-58	+153
Midland I	+10	-37	-4	+7	-23	+88	15	+32	-17	+196	+1	-3	-29	+206
II	+43	-11	+14	+11	+64	+119	-113	-12	+57	+19	-28	-4	-110	+49
East	-44	-27	-	-6	-66	-388	-375	-26	+2	+38	-99	-10	-134	-1,135
South-West	-27	+11	-	-11	-56	-497	-421	+12	-33	-261	+19	-10	-142	-1,420
Wales	+49	+70	-4	-10	+290	+278	+123	+129	+36	+304	+23	+9	+3	+1,054
Wales I	+65	+83	-5	-3	+296	+434	+86	+181	+46	+385	+5	+3	+16	+1,420
II	-2	+30	-2	-30	+271	-194	-336	-29	+3	+58	+77	+27	-22	-49
Rates per cent. of those for England and Wales.														
South-East	27	107	89	83	37	66	96	88	77	80	97	105	90	81
Greater London	30	114	104	90	28	70	131	90	71	80	94	84	93	85
Remainder of South-East	22	95	67	68	52	59	42	85	86	80	101	132	87	74
North	149	95	110	118	135	134	130	106	119	114	107	95	116	119
North I	156	84	122	168	198	123	175	99	136	120	101	64	115	125
II	92	106	159	60	150	117	120	98	125	106	119	120	97	111
III	72	83	98	120	112	128	109	109	91	112	100	139	120	113
IV	203	105	98	105	116	146	125	109	127	114	111	80	120	122
Midland	133	84	102	123	104	108	92	103	103	107	96	93	94	102
Midland I	116	79	95	118	88	107	98	105	95	110	100	93	97	103
II	168	94	117	128	134	110	82	98	118	101	88	90	89	101
East	30	84	100	85	65	68	39	96	101	102	57	77	86	82
South-West	57	106	100	79	70	59	31	98	89	86	108	123	85	78
Wales	178	140	95	75	255	123	80	122	112	116	110	120	100	117
Wales I	203	148	94	93	258	136	86	131	115	121	102	107	102	122
II	97	117	98	25	245	84	62	95	101	103	134	161	98	99

The greatest departures from the average mortality of the whole country in Table 15 are furnished on the one side by North I, which shows excesses under every one of the causes distinguished, except whooping cough, suffocation and congenital debility, producing a net excess of 15·69 deaths per 1,000 live births over the average for England and Wales; and on the other by the South-East, excluding Greater London, with comparatively favourable experience under every head distinguished except suffocation and injury at birth, yielding a total rate 16·49 lower than the general average.

As usual, three causes contribute more than any other to these differences, the three being bronchitis and pneumonia, diarrhoea, and premature birth. The predominant influence of these causes in determining local variations of infant mortality has been evident in each of the last eleven years. Jointly they account in 1933 for 70 per cent. of the divergence above the mean in North I, and for 74 per cent. of the divergence below the mean in the South-East, excluding Greater London.

Mortality from *bronchitis and pneumonia* (considered jointly because of evidence of interchangeability between these forms of return) shows the usual large excess in the North of England, amounting to 46 per cent. in North IV, 28 in North III, 23 in North I and 17 in North II. In contrast with this the Eastern counties show a rate 32 per cent., and the South-West and South-East outside Greater London 41 per cent. below the mean. Urbanization also is associated with a higher rate for this as for most other forms of infant mortality. Thus in 1933 (Table 14) the county boroughs outside Greater London showed a rate 37 per cent. above, and rural districts 29 per cent. below, the mean mortality from this cause, the divergence increasing from 41 per cent. in the first month to 74 per cent. at 9-12 months of age. Greater London, however, showed a rate only 70 per cent. of that in England and Wales.

Mortality from *diarrhoea* usually increases from South to North, but this sequence is profoundly modified by the extent of urbanization. In London the 1933 rate was 10·70 per 1,000 live births, in the outer ring 8·01, the county boroughs 8·12, other urban districts 4·42, and rural districts 3·36. The connection between diarrhoea mortality of infants in the whole year and the mean air temperature of the September quarter is seen from Table XVIII, where the years are arranged, first for England and Wales and then for London, in ascending order of the mean temperature values. For England and Wales as a whole the relation between diarrhoea rate and the summer temperature is shown by the fact that the average of the first 5 rates in the table is 6·06 and of the last 5 it is 8·15. For London it is more evident. Thus 1933 was one of 5 years in which the Greenwich mean temperature for the September quarter reached 63° F. or over, and these were also the only years in which the London diarrhoea death rate exceeded 9·8, whilst at the other end of the scale the 4 years with the coolest summer quarters were the only years giving rates below 9.

In 1933 North I had the highest rate and the South-West the lowest.

The third chief cause of local differences in infant mortality, *premature birth*, is more closely associated with geographical position than with urbanization, the range being from 121 per cent. of the

Table XVIII.—Infant Mortality from Diarrhoea and Enteritis in London and in England and Wales, and Mean Air Temperatures of the 3rd Quarter, 1921-33.

England and Wales.			London Administrative County.				
Year.	Mean Air Temp. of 3rd quarter °F.	Annual Diarrhoea rate.*	Year.	Mean Air Temp. of 3rd quarter (Greenwich).		Annual Diarrhoea rate.*	
				Actual.	Excess.†	Actual.	Excess.†
1922	56.0	5.57	1922	58.1	2.1	6.26	0.69
1931	56.8	5.20	1931	59.2	2.4	8.94	3.74
1924	58.0	6.32	1927	60.6	2.0	6.97	1.25
1927	58.6	5.72	1924	60.8	2.8	7.89	1.57
1925	58.6	7.47	1925	60.9	2.3	9.72	2.25
1930	58.7	5.43	1930	61.8	3.1	9.07	3.64
1928	58.7	6.21	1923	61.8	2.5	9.07	2.25
1923	59.3	6.82	1928	62.2	3.5	9.52	3.31
1932	59.8	5.91	1926	63.0	2.1	10.78	3.01
1929	60.0	7.14	1932	63.1	3.3	11.78	5.87
1926	60.9	7.77	1929	64.0	4.0	9.93	2.79
1921	61.0	13.79	1921	64.2	3.2	18.63	4.84
1933	62.0	6.13	1933	65.5	3.5	10.70	4.57

* Rate for the whole year, per 1,000 live births.

† *i.e.*, excess over corresponding figure for England and Wales.

general average for Wales I, to 80 per cent. for Greater London and the remainder of the South-East. The low Greater London rate of 14.91 and the comparatively small difference between the rate of 21.23 for all county boroughs outside Greater London and 18.30 for the rural districts (Table 14) suggest that urbanization has little influence on the rate.

Next to these three causes of infant mortality, come, for 1933, congenital malformations, congenital debility, injury at birth and convulsions (Table 12). *Congenital malformation* is steadily increasing in importance amongst the causes of infant deaths, its mortality having risen year by year from 4.16 in 1923 to 5.89 per 1,000 live births in 1933. This increase affects all sections of the population to much the same extent, but mortality in 1933 was highest in Wales I, and comparatively low in Greater London and the rest of the South-East.

Injury at birth has increased since 1918 without intermission except in 1922. Wales II shows the highest rate in 1933, and the East the lowest.

Congenital debility was, as usual, less frequently returned as a cause of death in Greater London than in any region, and the rate for the county boroughs was considerably less than that for the rural districts during the first four weeks of life. *Convulsions* continued to decline as a registered cause of death, the 1933 rate being only 45 per cent. of that of 10 years earlier and 22 per cent. of that of 20 years earlier (Table XIV). The Greater London rate has fallen from .98 in 1931 to .52 in 1933, whereas in Wales the rate is 4.77 and in North I 3.71 per 1,000 live births, the rate decreasing as usual from North to South.

Mortality at Ages over One Year.

Table XIX states the crude and standardized death-rates at all ages for sexes and persons for the whole country, as well as the mortality per million living at different ages, for 1932 and 1933, and in order to provide means of comparison with experience of some twenty years back, for 1911-14.

Table XIX.—Mortality from all Causes per Million Population, 1911-14, 1932, and 1933.

	Males.			Females.			Persons.		
	1911-14.	1932.	1933.	1911-14.	1932.	1933.	1911-14.	1932.	1933.
All Ages.									
Crude	14,890	12,745	12,948	13,065	11,396	11,711	13,948	12,043	12,304
Standardized	14,841	10,896	10,920	12,260	8,730	8,809	13,475	9,738	9,794
	15,911	11,824	11,874	13,713	10,033	10,162	14,779	10,887	10,976
0-	40,588	21,045	19,876	33,917	16,825	15,829	37,270	18,961	17,879
5-	3,304	2,201	2,268	3,255	1,937	2,120	3,279	2,070	2,194
10-	1,972	1,443	1,481	2,055	1,325	1,375	2,014	1,385	1,429
15-	2,942	2,535	2,552	2,683	2,245	2,270	2,811	2,890	2,411
20-	3,721	3,247	3,285	3,200	2,821	2,922	3,450	3,030	3,100
25-	4,912	3,336	3,507	4,057	3,105	3,208	4,464	3,216	3,353
35-	8,033	5,315	5,714	6,437	4,336	4,635	7,205	4,785	5,130
45-	14,808	10,831	11,676	11,363	8,010	8,332	13,018	9,319	9,879
55-	29,767	23,431	23,733	22,471	17,021	17,300	25,905	20,045	20,327
65-	62,844	57,949	56,715	50,722	43,328	44,009	56,124	49,864	49,698
75-	135,490	137,962	139,423	114,126	111,818	114,443	122,694	122,188	124,354
85 and upwards	271,337	289,190	286,550	237,360	254,671	259,386	249,201	265,615	268,062

A. English Standard (Population of England and Wales, 1901).
(See page 1.)

B. International Standard.

The mortality of children under 5 and of males aged 65-75 and 85 and upwards was lower than in 1932, but at all other ages distinguished in Table XIX it was slightly higher. At every age-group under 75 for both males and females mortality was lower than in 1911-14.

The extent of the fall at the various ages can be better appreciated from Table XX, in which the mortality in 1932 and 1933 is expressed as a percentage of the rate in the period 1911-14.

At "all ages" for both sexes the decline in the crude death-rate amounts to 12 per cent. (14 per cent. in 1932), which on standardization according to the English standard is increased to 27 per cent.

(28 per cent. in 1932). The fall is much greater at 0-5 than at any higher age, amounting in 1933 to about 51 per cent. for males and 53 for females.

Table XX.—Mortality at various ages from all causes in 1932 and 1933 per cent. of that for the same sex and age in 1911-14.

	Males.		Females.		Persons	
	1932.	1933.	1932.	1933.	1932.	1933.
All Ages—						
Crude	85.6	87.0	87.2	89.6	86.3	88.2
Standardized { A	73.4	73.6	71.2	71.9	72.3	72.7
{ B	74.3	74.6	73.2	74.1	73.7	74.3
0-	52	49	50	47	51	48
5-	67	69	60	65	63	67
10-	73	75	64	67	69	71
15-	86	87	84	85	85	86
20-	87	88	88	91	88	90
25-	68	71	77	79	72	75
35-	66	71	67	72	66	71
45-	73	79	70	73	72	76
55-	79	80	76	77	77	78
65-	92	90	85	87	89	89
75-	102	103	98	100	100	101
85 and upwards	107	106	107	109	107	108

After infancy the fall very rapidly decreases with advancing age up to early maturity, reaching a minimum of 12 per cent. for males and 9 per cent. for females at 20-25. The extent of fall then increases to 29 per cent. for males and 28 per cent. for females at 35-45. Thereafter the decrease recorded becomes progressively less for each sex and disappears after 75.

Mortality at 75-85 has fluctuated during the last 15 years without showing any progressive improvement. These fluctuations have been mainly governed by the occurrence of influenza epidemics, as may be seen from the fact that in the 6 years with an influenza crude death rate below .3 per 1,000 (1920, 1921, 1923, 1926, 1928, 1930) male mortality at 75-85 from all causes never exceeded 133 and female mortality never exceeded 109 per 1,000, whereas in the remaining 9 years with influenza above this level, the male rate for all causes ranged from 137 to 154 and the female rate from 112 to 131. In seeking an explanation for the unfavourable rates of recent years, this factor is an important one.

Table XXI measures the effect of changes in the birth-rate upon the mortality rate at 0-5 years in 1911-14 and from 1917 onwards. It shows that in all these years the fall of the birth-

rate has caused some under-statement of mortality at 0-5 for each sex except during the three years 1920-22, when its temporary rise after the war reversed the process. The fall of 52 per cent. shown for this mortality in Table XX is seen to be slightly over-stated from this cause, being reduced to 49 per cent. when allowance is made for its influence.

The crude rate at these ages was the lowest ever recorded, and the standardized rate equalled the low record of 1930.

Table XXI.—Comparison of Crude and Standardized Death-Rates per 1,000 living at Age 0-5, 1911-14 and 1917-33.

	Males.		Females.		Persons.	
	Crude.	Stand-ardized.	Crude.	Stand-ardized.	Crude.	Stand-ardized.
1911-14	40.6	40.8	33.9	34.2	37.3	37.5
1917	31.8	34.3	26.3	28.4	29.1	31.4
1918	38.9	43.1	34.1	37.5	36.5	40.3
1919	32.8	36.6	26.4	29.5	29.6	33.1
1920	36.2	31.8	28.9	26.0	32.5	29.0
1921	32.3	29.2	25.8	23.6	29.1	26.4
1922	30.2	28.5	24.5	23.1	27.4	25.8
1923	24.3	25.0	19.6	20.1	22.0	22.5
1924	25.1	27.3	20.2	21.8	22.6	24.6
1925	25.3	27.1	20.7	22.1	23.0	24.6
1926	23.3	24.9	18.8	20.0	21.1	22.4
1927	23.7	25.2	18.9	20.0	21.3	22.6
1928	21.9	23.3	17.4	18.5	19.7	20.9
1929	26.3	27.7	21.6	22.7	24.0	25.2
1930	20.5	21.4	16.0	16.7	18.3	19.1
1931	22.4	23.1	17.4	18.0	19.9	20.6
1932	21.0	22.0	16.8	17.6	19.0	19.8
1933	19.9	21.2	15.8	16.9	17.9	19.1

Mortality at 1-5.—Table XXII shows that mortality has fallen more rapidly for the years immediately following infancy than for the first year of life itself, so the features of the changes in progress at these ages also call for some consideration. Compared with 1911-14 the decline in 1933 has been least in the first year and greatest in the second, decreasing continuously from the second to the fifth year of life. The second year of life usually manifests the greatest degree of annual variation and would seem to be the age of greatest susceptibility to disturbing factors. That the death-rates of children aged 1-5 are more sensitive than those of infants or older children to environmental factors such as are indicated by urbanisation or density of persons per room was shown in the Review for 1932 (Table XXVIII).

The distribution throughout the country of mortality at these ages is shown in Table XXIII, which may be compared with Table VI (Infant Mortality). The greatest excess over the general average recorded in the table at ages 1-2 is for North I, which

Table XXII.—Mortality per 1,000 living (both sexes), in each of the first Five Years of Life, 1911-14, 1932, and 1933.

Year of Life.	1911-14.	1932.	1933.	1933 per cent. of	
				1911-14.	1932.
0-1	118.16	67.17	64.85	54.9	96.5
1-2	34.06	14.18	13.06	38.3	92.1
2-3	13.68	6.04	5.86	42.8	97.0
3-4	8.32	4.16	4.09	49.2	98.3
4-5	6.14	3.32	3.36	54.7	101.2
0-5 { Crude ..	37.27	18.96	17.88	48.0	94.3
{ Stan ^d ..	37.52	19.81	19.05	50.8	96.2
1-5 { Crude ..	15.62	6.94	6.56	42.0	94.5
{ Stan ^d ..	15.54	6.92	6.58	42.3	95.1

shows a rate more than twice the corresponding rates for the Eastern region, the South-West and the South-East. Next in order comes North IV, followed by North II and Wales I, all with rates more than 30 per cent. in excess of the average. At 2-5 North IV shows the highest rate, followed by North I and Wales I. The South-East excluding Greater London has the lowest mortality of any region at both ages, the rates for the South-West being only slightly less favourable. The division of Wales into two regions indicates that Wales II, which is of course mainly rural, had, as in 1931 and 1932, a mortality for the second year of life much below the general average.

The occurrence of a large reduction of mortality at age 1-2 in good years has been pointed out in previous Reviews. It is to be expected that the most susceptible age would also exhibit the greatest range of regional variation. It has been shown that when the regional rates are expressed as percentages of the rate for England and Wales, their range tends to increase during the first two years of life. In 1933 the range was 59-141 at 6-9 months, and 57-142 at 9-12 months, increasing to 59-162 in the second year, and falling to 67-137 at ages 2-5 (Tables XI and XXIII).

The association with urbanization at these four age periods is reflected in the differences between the percentage rates for London and its outer ring, amounting to 40 at 6-9 months, 35 at 9-12 months,

34 at 1-2 years and 23 at 2-5, and by the corresponding differences between the county boroughs and rural districts, namely 57, 60, 65 and 47.

Table XXIII.—Distribution of Mortality in Early Childhood, 1933.

	Deaths per 1,000 living (both sexes).		Mortality per cent. of that in England and Wales.	
	1-2 years.	2-5 years.	1-2 years.	2-5 years.
England and Wales ..	13.06	4.44	100	100
South-East	8.91	3.48	68	78
Greater London ..	9.65	3.81	74	86
Remainder of South-East.	7.76	2.98	59	67
North	18.10	5.84	139	132
North I	21.10	5.90	162	133
" II	17.12	5.24	131	118
" III	14.40	5.66	110	127
" IV	19.11	6.07	146	137
Midland	12.44	3.79	95	85
Midland I	12.26	3.83	94	86
" II	12.79	3.72	98	84
East	9.18	3.35	70	75
South-West	8.47	3.06	65	69
Wales	15.35	5.38	118	121
Wales I	17.15	5.77	131	130
" II	9.79	4.22	75	95
County boroughs* ..	17.94	5.54	137	125
Other urban districts* ..	12.36	4.30	95	97
Rural districts* ..	9.41	3.45	72	78
Greater London—				
Administrative County	11.91	4.33	91	98
Outer Ring	7.43	3.31	57	75

* Excluding Greater London.

Causes of Juvenile Mortality.—London mortality at 1-2 years was lower in 1933 than in any of the preceding 11 years, and at 2-5 it was lower than in any of those years except 1931. The London experience for each year from 1922-33, depicted in Table XXIV, indicates that measles, whooping cough and pneumonia have been chiefly responsible for the wide fluctuations in mortality during the second year of life, and when these causes together with influenza are omitted, the residual death-rates have followed a declining course with only slight fluctuations, the 1933 rate being slightly over half of that in 1922.

The chief causes of death in England and Wales at ages 1-5 are set forth in Table XXV, which also provides comparison with 1932 and with 1911-14.

Table XXIV.—Mortality from Various Causes at 1-2 and 2-5 years of Age in London Administrative County in each year 1922 to 1933.

	1-2 years.						Death rate per cent. of England and Wales.	2-5 years.	
	Death rate per 1,000 Living.							Death rate from all causes.	
	Measles.	Whooping cough.	In-fluenza.	Pneu-monia.	Other causes.	All causes.		Per 1,000 Living.	Per cent. of England and Wales.
1922..	8.08	5.16	1.25	12.81	9.47	36.77	148	12.03	155
1923..	1.87	1.47	0.09	4.51	7.31	15.25	81	5.26	93
1924..	6.93	2.12	0.50	9.05	6.64	25.24	115	6.84	117
1925..	1.87	3.42	0.21	5.99	6.21	17.70	82	5.30	87
1926..	5.55	0.99	0.09	6.15	6.33	19.11	104	5.19	99
1927..	1.04	2.38	0.38	6.15	5.95	15.90	81	4.81	83
1928..	8.33	2.01	0.25	5.64	6.32	22.55	139	5.71	114
1929..	1.44	6.19	1.06	9.75	6.19	24.63	105	5.68	86
1930..	7.55	0.61	0.05	4.35	5.97	18.53	135	4.70	101
1931..	0.76	1.59	0.34	5.13	5.46	13.28	85	4.15	86
1932..	6.38	1.78	0.15	3.87	5.98	18.16	128	5.62	124
1933..	0.68	1.89	0.28	4.27	4.78	11.91	91	4.33	98

Mortality from all causes combined at these ages was the lowest yet recorded, being only 42 per cent. of the rate in 1911-14 and 64 per cent. of that in 1921-25. The principal causes showing an increase over the preceding year were influenza, the pneumonias, scarlet fever, diarrhoea, diphtheria, laryngitis, and congenital malformations. On the other hand, measles, each form of tuberculosis, rickets, meningitis, convulsions, bronchitis, inflammation of the stomach, and burns and scalds all established new low records.

Table XXV.—Deaths from Various Causes per Million living at Ages 1-5 Years in 1911-14, 1932 and 1933. (Both Sexes.)

Cause of Death.	Death-rate.			Cause of Death.	Death-rate.		
	1911-14.	1932.	1933.		1911-14.	1932.	1933.
7. Measles	2,673	988	571	105. 2. Laryngitis	152	16	25
8. Scarlet fever .. .	373	92	129	106. Bronchitis	872	207	183
9. Whooping cough .. .	1,216	602	494	107. Broncho-pneumonia .. .	2,170	1,367	1,403
10. Diphtheria .. .	781	387	394	108 & 109. Pneumonia (Lobar and not otherwise defined).	866	355	400
11. Influenza	60	148	283	Other Respiratory Diseases ..	140	68	53
23. Tuberculosis of Respiratory System.	237	86	72	118. 1. Inflammation of the Stomach.	94	21	19
24. Tuberculosis of Nervous System.	705	380	356	119 & 120. Diarrhoea and enteritis	1,639	266	300
25. Tuberculosis of Intestines and Peritoneum.	391	86	69	130. Acute nephritis	89	29	28
26-32. Other Tuberculous Diseases.	288	127	98	157. Congenital malformations.	85	89	97
63. 1. Rickets.. .. .	172	66	41	181. Burns and scalds .. .	360	184	179
79. Meningitis	451	126	106	Other Violence	274	256	266
86. Convulsions	460	85	77	Other Causes	1,071	909	915
				All Causes	15,619	6,939	6,558

It was demonstrated in Table XXIV of the Review for 1931 that the quinquennial rates since 1876-80 at ages 0-5 have fallen continuously, both for tuberculosis of the nervous system and of the intestines and peritoneum. To maintain continuity with that table the rates per 1,000 at 0-5 years in 1933 were 0.36 for the nervous system, 0.08 for the intestines and peritoneum, 0.20 for other forms and 0.64 for all forms of tuberculosis. Expressing the tuberculosis rates at 1-5 years as percentages of those in 1911-14 and 1921-25, the extent of the fall in mortality from these causes for children of pre-school age can be seen from the following:—

Tuberculosis of	1933 per cent. of	
	1911-14.	1921-25.
Nervous system	50	74
Intestines and peritoneum .. .	18	36
Respiratory system	30	50
Other organs	34	58

The decline of other infective and respiratory diseases and of meningitis, convulsions and rickets since 1921 is revealed by the annual rates in Table XXVI.

Table XXVI.—Death rates from various causes per million living at ages 1-5 years in each year 1921-1933.

	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria.	Bronchitis and pneumonia.	Diarrhoea and enteritis.	Meningitis.	Convulsions.	Rickets.
1921 ..	603	198	853	778	3,305	990	288	321	109
1922 ..	1,530	229	1,838	723	4,461	403	263	268	86
1923 ..	1,332	169	745	464	2,700	479	233	219	98
1924 ..	1,155	149	716	438	3,368	424	205	189	94
1925 ..	1,326	172	1,108	473	3,033	466	188	191	102
1926 ..	848	105	749	474	2,784	502	165	153	86
1927 ..	950	90	743	448	3,339	358	157	133	80
1928 ..	1,122	92	572	504	2,250	368	120	99	102
1929 ..	965	102	1,411	533	3,940	419	138	117	89
1930 ..	1,142	116	401	552	1,792	276	111	89	78
1931 ..	923	87	540	427	2,487	271	114	87	80
1932 ..	988	92	602	387	1,929	266	126	85	66
1933 ..	571	129	494	394	1,986	300	106	77	41

The most favourable years for measles were 1933 and 1921, and for whooping cough 1930 and 1933, the worst years for the latter being 1922, 1929 and 1925. Scarlet fever and diphtheria rates moved downwards together from 1922 to 1924, and from 1930 to 1931, and upwards in unison from 1924 to 1925, 1927 to 1930 and 1932 to 1933. Bronchitis and pneumonia mortality fell below 2 per 1,000 only in the years 1930, 1932, 1933, and below 3 per 1,000 also in 1928, 1931, 1923, 1926; the low rates of the last 3 years are the more remarkable in view of the high influenza prevalence, particu-

larly in 1933, the other four years of low mortality being characterised by absence of influenza epidemics. Meningitis, other than cerebrospinal or tuberculous, is rapidly disappearing as a certified cause of death.

Mortality of the Aged.—The rapid increase in the relative magnitude of this section of the population continues to form an outstanding feature of our vital statistics. Persons over 70 years of age were 297 per 10,000 total population in 1911, 344 in 1921, and 426 in 1931, and were estimated as forming 443 per 10,000 in 1933.

Table XXVII.—Mortality over 70 Years of Age in 1911-20, 1921-30, 1931, 1932, and 1933, from the chief Causes of Death.

	Deaths from each Cause per 1,000 Total Deaths.					Mortality per 1,000 Living.				
	1911-20.	1921-30.	1931.	1932.	1933.	1911-20.	1921-30.	1931.	1932.	1933.
MALES.										
Influenza (11)	20	26	23	23	37	2.3	2.8	2.6	2.6	4.1
Cancer (45-53)	81	107	113	119	116	9.4	11.8	12.6	13.2	12.8
Heart Diseases (90-95)	148	205	300	308	317	17.1	22.7	33.3	34.0	34.9
Disease of Blood Vessels, including Cerebral Haemorrhage (82, 96, 97, 99 and 100)	163	195	171	170	166	18.8	21.6	19.0	18.8	18.3
Bronchitis (106)	137	110	78	63	63	15.9	12.1	8.7	7.0	7.0
Pneumonia (107-109)	34	35	32	31	31	4.0	3.9	3.6	3.4	3.4
Chronic Nephritis (131 and 132)	29	29	33	35	32	3.3	3.2	3.7	3.9	3.5
Old Age (162)	222	140	87	87	79	25.7	15.5	9.7	9.6	8.7
Other Causes	166	153	163	163	158	19.0	17.2	17.7	18.0	17.4
All Causes	1,000	1,000	1,000	1,000	1,000	115.5	110.8	111.1	110.5	110.1
FEMALES.										
Influenza (11)	24	31	31	31	50	2.3	3.0	3.0	2.9	4.8
Cancer (45-53)	87	105	107	109	108	8.7	10.2	10.3	10.2	10.4
Heart Diseases (90-95)	153	223	315	322	329	15.2	21.6	30.2	30.2	31.6
Disease of Blood Vessels, including Cerebral Haemorrhage (82, 96, 97, 99 and 100)	157	181	164	170	159	15.5	17.6	15.7	15.9	15.2
Bronchitis (106)	149	117	87	69	70	14.8	11.4	8.2	6.5	6.7
Pneumonia (107-109)	32	34	33	33	32	3.2	3.3	3.2	3.1	3.1
Chronic Nephritis (131 and 132)	21	23	28	29	27	2.1	2.2	2.7	2.7	2.6
Old Age (162)	248	165	109	111	100	24.6	16.0	10.5	10.4	9.6
Other Causes	129	121	126	127	124	12.7	11.7	11.9	11.9	11.9
All Causes	1,000	1,000	1,000	1,000	1,000	99.0	97.0	95.8	93.8	96.1
PERSONS.										
Influenza (11)	22	29	28	27	44	2.3	3.0	2.9	2.8	4.5
Cancer (45-53)	85	106	111	114	112	9.0	10.8	11.3	11.4	11.4
Heart Diseases (90-95)	151	215	308	316	324	16.0	22.0	31.5	31.8	33.0
Disease of Blood Vessels, including Cerebral Haemorrhage (82, 96, 97, 99 and 100)	159	187	167	170	162	16.9	19.2	17.1	17.1	16.5
Bronchitis (106)	144	114	82	67	67	15.2	11.7	8.4	6.7	6.8
Pneumonia (107-109)	33	34	33	32	32	3.5	3.5	3.4	3.2	3.2
Chronic Nephritis (131 and 132)	24	26	30	32	29	2.6	2.6	3.1	3.2	3.0
Old Age (162)	237	154	100	100	91	25.0	15.8	10.1	10.1	9.3
Other Causes	145	135	141	143	139	15.3	14.0	14.3	14.4	14.2
All Causes	1,000	1,000	1,000	1,000	1,000	105.8	102.7	102.1	100.7	101.9

The causes of death at ages over 70 are grouped, as in previous years, in Table XXVII. The year was noteworthy for its low mortality rates from bronchitis and pneumonia combined with a high mortality attributed to influenza at these ages. The cancer rate increased slightly for females, but not for males.

Centenarians.—Among the deaths registered during the year there were 110 of reputed centenarians, 19 of whom were males and 91 females. In the preceding three years the numbers were 61, 91, and 109 respectively. Particulars of the ages returned and of the regions concerned are given in Table XXVIII.

Table XXVIII.—Age at Death of Centenarians, 1933.

	Males.						Females.									
	100 and over	100	101	102	103	104	100 and over	100	101	102	103	104	105	106	107	108
Greater London	4	2	1	1	—	—	17	10	5	—	1	—	—	1	—	—
Remainder of South-East	3	—	1	—	1	1	26	12	6	2	2	3	1	—	—	—
North	5	3	2	—	—	—	9	4	3	2	—	—	—	—	—	—
Midlands	2	1	—	1	—	—	12	6	1	2	2	—	1	—	—	—
East	2	1	1	—	—	—	10	5	2	1	1	1	—	—	—	—
South-West	3	1	1	1	—	—	10	4	3	—	2	—	—	—	—	1
Wales	—	—	—	—	—	—	7	3	1	2	1	—	—	—	—	—
England and Wales .. .	19	8	6	3	1	1	91	44	21	9	9	4	2	1	—	1

Mortality at Single Years of Age.

For 1933, as for previous years, the deaths of all males and of females according to marital condition, are given at each year of age in Table 19. The distinction of marital condition is not possible for males since this information is not afforded by the registers. In Table XXIX the deaths at each year of age for the 3 year period 1930-32, symmetrically disposed about the census, have been combined, and the mortality rates resulting from division of these numbers by 3 times the census populations at the corresponding ages are shown in Table XXX. Similar data for the periods 1910-12 and 1920-22 were presented in Tables XXXIII-IV of the Report for 1912 and Tables XXV-VI of the 1923 Review respectively.

As in 1910-12 and 1920-22, the deaths reveal irregularities at certain ages attributable to errors of statement of age, which are also noticeable in the census returns of the living, these errors being mainly of "round numbers" and of "even numbers." The piling up of deaths recorded at 38-40, and the excess at 32, 42, 50, 52, 54, 56, 58, 60, 65, 70, 72, and the deficiency at 55, compared with the numbers expected from a smooth progression, have all been noticed previously. Of these, the continued aversion to 55, with resulting transfer to 54, is the most remarkable feature, since it is not noticed at 45, 65 or 75, the preference for the "round number"

The excess of female over male deaths at 12-13, and at ages from 73 onwards, has been noticed at each period. The excess at 23-33 in 1920-22 was due to depletion of the young male population by the war and this also accounts for the female excess of deaths at 30-34 and 36 in 1930-32. The constancy of male deaths at successive years of age between 18 and 31 was commented upon in 1923, and it is now evident from 20 to 34 for males and also at 24 to 33 for females. It arises from a levelling out of the mortality risks between 20 and 30, combined with the effect of the falling birth-rate during the present century upon the population curve at these ages. Table XXX indicates that between 20 and 30 the male death-rate increased only from 3.2 to 3.3, and the female rate from 2.7 to 3.1, whereas in 1910-12 the increases were from 3.6 to 4.5 and 2.9 to 3.8 respectively. This is depicted also in Diagram 1.

The progression of death-rates of children at the school ages 5-15 is shown below, comparison being also made with the corresponding rates of 10 and 20 years ago.

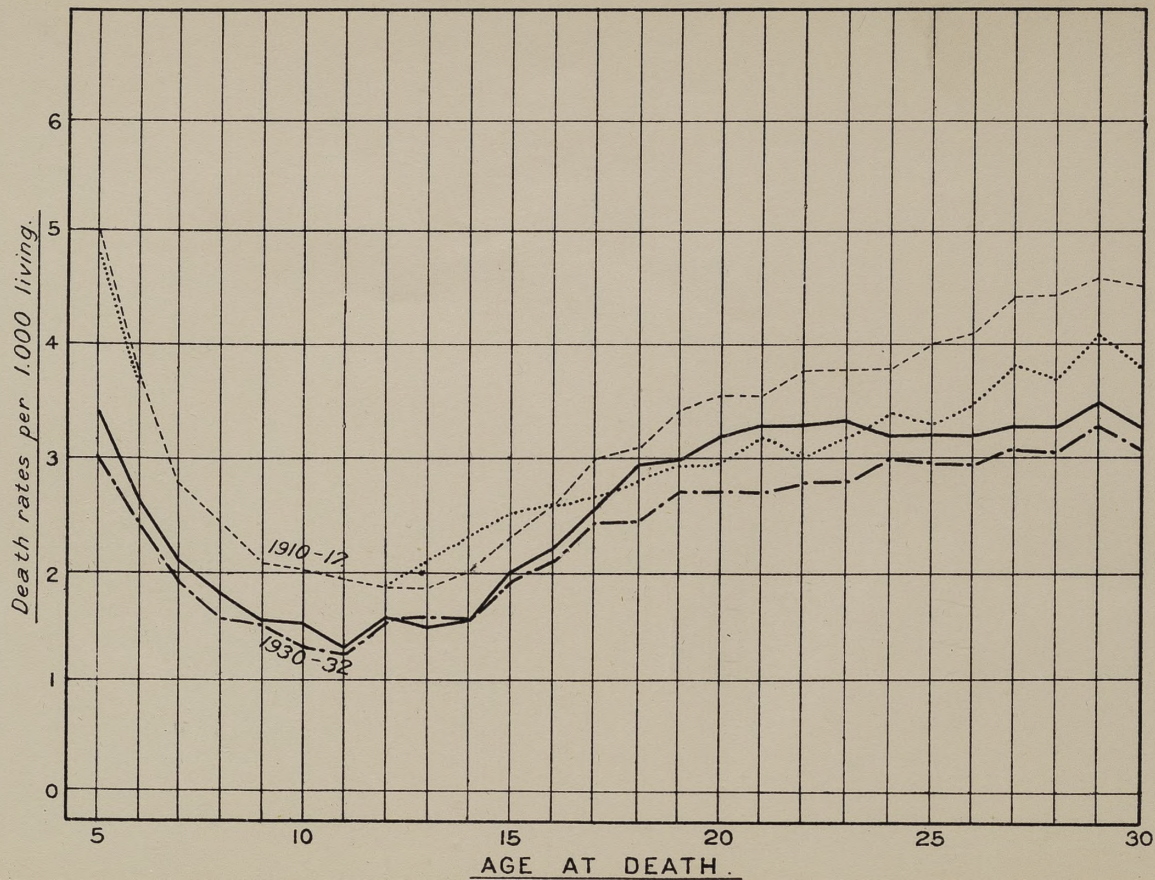
Age	..	..	..	5	6	7	8	9	10	11	12	13	14	15
Rates per 10,000 living	Boys	1910-12		50	37	28	24	21	20	19	18	18	20	23
		1920-22		43	34	27	23	20	18	18	17	18	19	22
		1930-32		34	26	21	18	16	15	(13)	(16)	15	16	20
	Girls	1910-12		49	37	28	24	21	20	19	18	21	23	25
		1920-22		44	31	26	21	19	17	18	20	21	24	
		1930-32		30	24	19	16	15	13	(12)	(16)	16	16	19
Per cent. fall from 1910-12 to 1930-32	Boys		32	30	25	25	24	25	32	11	17	20	13	
	Girls		39	35	32	33	29	35	(37)	(11)	24	30	24	

The relative improvement since 1910-12 has been greater for girls than boys at each age except at 12. The irregularity of the 1930-32 rates and curves (Diagram 1) at ages 11-12 is due to the sudden changes in birth rate from 1916 to 1920 which make the rates based on 3 times the census population inaccurate at ages 11-14 in 1930-32. Using the more accurate sums of the estimated populations of the 3 years at ages 10, 11, 12, 13, 14, the resulting rates per 100,000 children living at these ages are 141, 139, 139, 151, 166, showing a smooth progression with minimum at 11-12, whereas by the method used the successive rates are 140, 129, 157, 158, 160.

At other ages the error involved in substituting 3 times the census population for the sum of the estimated populations of the years 1930-32 is of no consequence, the former method of estimating the total population at risk having in fact certain advantages at ages after childhood, since the 1930 population at individual ages was necessarily built up from the preceding census of 1921. The only ages at which the female rate equalled or exceeded the male

DIAGRAM 1. DEATH RATES PER 1000 LIVING AT AGES 5 TO 30.

1910-12 MALES FEMALES 1930-32 MALES ——— FEMALES ———



rate were 12-14 (6-16 in 1910-12, and 5, 10, 12-15 in 1920-22) and 97, the latter being evidently a statistical accident owing to irregularities due to mis-statement of age by males at the census.

Mortality of Women according to Marital Condition.

Table XXXI gives the deaths in the triennium 1930-32 at each year of age from 15 onwards for single, married, and widowed or divorced women, and Table XXXII gives, for each year and quin-

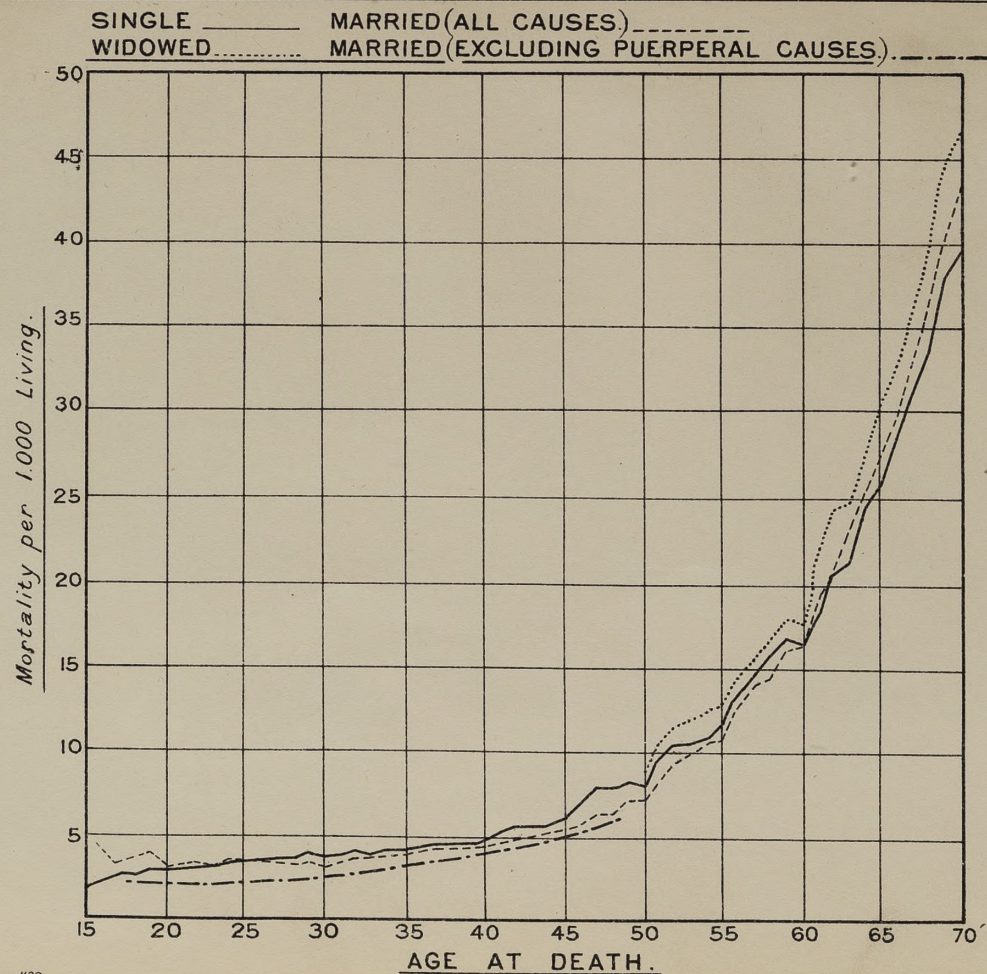
Table XXXI.—Deaths of Single, Married and Widowed Females at each year of age from 15 upwards in the three years 1930-32.

Age.	Single.	Married.	Widowed and Divorced.	Age.	Single.	Married.	Widowed and Divorced.
Total 15 years & upwards	117,669	240,726	251,632	57	1,407	5,755	1,779
15	1,809	—	—	58	1,612	6,027	2,123
16	2,210	5	—	59	1,544	6,014	2,295
17	2,465	23	—	60	1,577	5,922	2,636
18	2,488	88	—	61	1,497	5,774	2,780
19	2,583	237	—	62	1,708	6,354	3,429
20	2,464	335	1	63	1,731	6,660	3,701
21	2,386	555	2	64	1,833	6,581	4,119
22	2,268	819	4	65	1,945	6,566	5,024
23	2,021	1,053	8	66	1,919	6,102	5,072
24	1,821	1,366	15	67	2,032	6,232	5,667
25	1,589	1,504	22	68	2,108	6,238	6,317
26	1,430	1,656	18	69	2,198	5,940	6,803
27	1,345	1,835	30	70	2,251	5,889	7,498
28	1,177	1,985	39	71	2,275	5,419	7,580
29	1,121	2,100	34	72	2,474	5,532	9,040
30	990	2,152	64	73	2,397	4,975	9,721
31	872	2,215	70	74	2,356	4,744	10,217
32	895	2,390	83	75	2,521	4,198	10,770
33	808	2,277	88	76	2,415	3,828	11,017
34	806	2,448	104	77	2,178	3,236	10,585
35	766	2,440	126	78	2,200	2,933	11,112
36	771	2,622	154	79	2,141	2,494	10,919
37	764	2,559	169	80	2,075	2,163	10,555
38	804	2,756	151	81	1,875	1,662	9,914
39	778	2,891	234	82	1,786	1,465	9,286
40	849	2,952	251	83	1,605	1,133	8,818
41	793	2,735	254	84	1,468	884	8,356
42	924	3,201	359	85	1,383	627	7,425
43	883	3,130	348	86	1,164	527	6,762
44	843	3,135	423	87	957	361	5,562
45	912	3,360	515	88	781	266	4,600
46	996	3,534	561	89	651	163	3,719
47	1,067	3,849	594	90	558	122	3,057
48	1,104	4,034	730	91	414	64	2,297
49	1,090	4,375	862	92	317	49	1,839
50	1,124	4,445	883	93	235	30	1,322
51	1,135	4,418	929	94	156	15	924
52	1,263	5,075	1,154	95	122	12	688
53	1,198	5,118	1,225	96	62	7	448
54	1,268	5,367	1,385	97	61	2	316
55	1,295	5,038	1,459	98	42	2	212
56	1,407	5,680	1,658	99	21	1	145
				100 and over	35	1	177

Table XXXII.—Annual death-rates of Single, Married and Widowed Females per 1,000 living at quinquennial groups of ages and at each year of age from 15 upwards in the three years 1930-32.

Age.	Single.	Married.	Widowed and Divorced.	Age.	Single.	Married.	Widowed and Divorced.
15-20	2.3	3.8	—	49	8.3	7.5	9.5
20-25	2.7	3.0	4.3	50	8.2	7.4	8.8
25-30	3.2	3.0	4.1	51	9.8	8.5	10.4
30-35	3.6	3.2	4.6	52	10.4	9.4	11.4
35-40	4.1	3.9	4.7	53	10.4	9.9	11.7
40-45	5.5	4.7	5.5	54	10.9	10.6	12.3
45-50	7.5	6.4	8.0	55	11.7	10.8	12.5
50-55	9.9	9.1	11.0	56	13.1	12.6	14.1
55-60	14.3	13.4	15.3	57	14.4	13.8	15.3
60-65	20.4	20.7	23.4	58	15.9	14.3	16.3
65-70	31.0	32.5	36.5	59	16.7	16.2	18.1
70-75	50.7	52.4	59.2	60	16.5	16.4	18.0
75-80	86.6	84.2	97.7	61	18.8	19.1	22.1
80-85	143.5	134.2	151.0	62	21.2	21.0	24.3
85-90	225.2	184.2	228.2	63	21.9	23.3	24.8
90-95	324.3	213.6	324.5	64	24.4	25.1	27.4
95-100	369.3	173.9	434.1	65	25.7	27.7	30.7
100 and over.	530.3	166.7	561.9	66	28.4	29.3	32.1
15	1.9	—	—	67	31.1	32.9	36.2
16	2.1	4.4	—	68	33.5	35.9	39.6
17	2.4	3.2	—	69	38.4	40.0	44.2
18	2.4	3.4	—	70	39.0	43.3	46.3
19	2.6	4.0	—	71	47.1	47.9	51.8
20	2.6	2.9	2.6	72	54.5	54.8	60.5
21	2.7	2.9	2.8	73	57.0	58.8	67.5
22	2.8	3.0	3.4	74	61.6	65.8	71.8
23	2.8	2.9	4.2	75	72.1	70.7	80.9
24	2.9	3.1	5.4	76	80.5	79.4	89.7
25	2.9	3.0	5.6	77	86.4	87.7	95.7
26	3.0	2.9	3.4	78	98.1	97.8	111.0
27	3.3	3.0	4.6	79	108.8	105.5	121.3
28	3.3	3.0	4.6	80	115.2	115.1	121.6
29	3.6	3.1	3.2	81	137.9	124.9	148.3
30	3.4	2.9	4.7	82	149.3	148.2	153.0
31	3.5	3.1	4.6	83	166.3	158.0	171.5
32	3.8	3.4	4.7	84	179.9	166.9	185.7
33	3.7	3.3	4.5	85	206.4	165.7	202.5
34	3.8	3.4	4.4	86	213.0	199.6	218.1
35	3.8	3.5	4.7	87	230.5	175.4	236.0
36	3.9	3.7	5.0	88	242.6	204.8	253.7
37	4.2	3.8	4.9	89	273.3	211.4	273.1
38	4.3	3.9	3.6	90	287.9	227.2	294.3
39	4.5	4.3	5.2	91	315.8	187.1	312.9
40	4.9	4.3	4.8	92	352.2	226.9	351.1
41	5.3	4.5	5.1	93	382.1	277.8	359.1
42	5.8	4.8	5.8	94	374.1	138.9	378.8
43	5.8	4.9	5.3	95	380.1	307.7	410.3
44	5.8	5.1	6.2	96	299.5	166.7	465.2
45	6.3	5.5	6.9	97	462.1	95.2	440.7
46	7.2	5.8	7.3	98	411.8	133.3	433.5
47	8.0	6.6	7.5	99	291.7	47.6	451.7
48	8.0	6.6	8.3	100	530.3	166.7	561.9
				and over			

DIAGRAM 2. MORTALITY OF WOMAN ACCORDING TO MARITAL CONDITION, 1930-32.



quennium of age, the mortality rates obtained by dividing these deaths by 3 times the corresponding census populations. The rates at ages 15 to 70 are depicted in Diagram 2. Similar compilations for 1910-12 and 1920-22 are to be found in Tables XXXV-VI of the Report for 1912 and Tables XXVII-VIII of the Review for 1923. A comparison of mortality risks of the single and married with the corresponding risks 10 and 20 years ago is of special interest having regard to the great emphasis at present being placed upon the dangers of childbearing. Table XXXIII makes such a comparison at quinquennial ages from 15 to 85, and the last columns

Table XXXIII.—Mortality per 10,000 living of single and married women at quinquennial ages, 1910-12, 1920-22, and 1930-32.

Age.	1910-12.			1920-22			1930-32.			1930-32 per cent. of 1910-12.		
	Single.	Married.	Diffce.	Single.	Married.	Diffce.	Single.	Married.	Diffce.	Single	Married.	Widowed or Divorced.
15-19	26	62	+ 36	26	43	+ 17	23	38	+ 15	88	61	—
20-24	29	39	+ 10	31	37	+ 6	27	30	+ 3	93	77	68
25-29	33	39	+ 6	35	38	+ 3	32	30	- 2	97	77	73
30-34	43	46	+ 3	40	41	+ 1	36	32	- 4	84	70	75
35-39	53	59	+ 6	47	49	+ 2	41	39	- 2	77	66	60
40-44	69	72	+ 3	61	56	- 5	55	47	- 8	80	65	58
45-49	96	92	- 4	83	72	- 11	75	64	- 11	78	70	62
50-54	127	124	- 3	114	101	- 13	99	91	- 8	78	73	67
55-59	173	179	+ 6	154	144	- 10	143	134	- 9	83	75	68
60-64	257	254	- 3	219	218	- 1	204	207	+ 3	79	81	75
65-69	369	372	+ 3	338	341	+ 3	310	325	+ 15	84	87	85
70-74	584	591	+ 7	532	530	- 2	507	524	+ 17	87	89	83
75-79	919	906	- 13	860	847	- 13	866	842	- 24	94	93	94
80-85	1,419	1,347	- 72	1,364	1,242	- 122	1,435	1,342	- 93	101	100	98

show the relative decline in mortality rates since 1910-12 for the single, married, and widowed or divorced.

At every age up to 60 the mortality of the married has fallen to a greater extent than that of the single, and at every age except 30-35 and 75-80 the mortality of the widowed has fallen more than that of the married. At ages 20-30 the mortality risk for married women has declined by 23 whereas for single women it has declined by only 3 to 7 per cent.; at ages 30-50 the risk for the married has fallen by 30 to 35 per cent., but for single women by only 16 to 23 per cent. This greater rate of improvement in vitality of the married than the single at ages up to 60 was progressive during the 20 years; in 1910-12 the married were at a disadvantage at every quinquennium of age up to 45, in 1920-22 at every quinquennium up to 40, but in 1930-32 the mortality risk had become greater for the single women at each age group from 25 to 60.

In Table XXXIV the 1930-32 rates for married and single women from puerperal causes, and other than puerperal causes, are compared at each quinquennium of age from 15 to 55 with the corresponding rates in the decennium 1911-20.

Table XXXIV.—Mortality, per million living, of single and married women from puerperal and other causes, by age, 1911-20 and 1930-32.

Age.	1911-20.						1930-32.					
	All causes.		Puerperal causes.		Causes other than puerperal.		All causes.		Puerperal causes.		Causes other than puerperal.	
	S.	M.	S.	M.	S.	M.	S.	M.	S.	M.	S.	M.
15-	3,179	5,720	31	2,019	3,148	3,701	2,274	3,785	17	1,351	2,257	2,434
20-	3,662	4,422	69	990	3,593	3,432	2,743	2,985	41	743	2,702	2,242
25-	4,337	4,662	66	795	4,271	3,867	3,163	2,984	43	623	3,120	2,361
30-	5,100	4,886	68	709	5,032	4,177	3,613	3,219	59	557	3,554	2,662
35-	5,993	5,774	50	666	5,943	5,108	4,135	3,855	53	455	4,082	3,400
40-	7,529	6,743	24	361	7,505	6,382	5,502	4,700	27	243	5,475	4,457
45-	10,203	8,763	1	49	10,202	8,714	7,517	6,370	3	30	7,514	6,340
50-55	13,715	11,904	—	2	13,715	11,902	9,901	9,102	—	—	9,901	9,102
15-55*	6,715	6,609	39	699	6,676	5,910	4,856	4,625	30	500	4,826	4,125

* Equivalent average death rates, that is, standardized rates based upon a population uniformly distributed according to age.

The legitimate birth rate per 1,000 married women aged 15-45 was 173 in 1911-20 and 122 in 1930-32, a fall of 29 per cent., and the birth rate amongst single women declined by a similar proportion. This accounts for the drop in the average puerperal mortality risk for married women at each age, and for single women at each age under 35, the relative change in the puerperal risk, expressed as a percentage of the 1911-20 rate at each age, being as follows:—

	15-	20-	25-	30-	35-	40-45
Single	- 45	- 41	- 35	- 13	+ 6	+ 12
Married	- 33	- 25	- 22	- 21	- 32	- 33

After excluding the different risks due to childbearing, the mortality rates from non-puerperal causes amongst married women per cent. of those amongst single women of the same ages are as follows:—

	15-	20-	25-	30-	35-	40-	45-	50-55
1911-20	118	96	91	83	86	85	85	87
1930-32	108	83	76	75	83	81	84	92

At every quinquennium of age from 20 to 55 the married women have a lower non-puerperal mortality than single women, and this advantage has increased in recent years; in 1911-20 it was 4 per cent. of the single rate at 20-25, 9 per cent. at 25-30, and about 15 per cent. after, whilst in 1930-32 it amounted to about 25 per cent. at ages 25-35 and exceeded 15 per cent. at 20-25 and 35-50. This can be seen in Diagram 2.

The relative change in the non-puerperal risk, expressed as a percentage of the 1911-20 rate at each age was as follows:—

	15-	20-	25-	30-	35-	40-	45-	50-55
Single	- 28	- 25	- 27	- 29	- 31	- 27	- 26	- 28
Married	- 34	- 35	- 39	- 36	- 33	- 30	- 27	- 24
Widowed	—	—	—	- 35	- 36	- 39	- 32	- 31

The improvement has been greater for the married than for the single at each age up to 50, the contrast being especially great at 20-35.

The mortality rates of widowed or divorced women in 1930-32 from non-puerperal causes per cent. of the rates for single women of the same ages, were:—

	25-	30-	35-	40-	45-	50-	55-	60-65
1930-32	121	124	111	99	106	111	108	115

This excess mortality amongst widows at all ages was commented upon in the Review for 1923; the contrast is much less than in 1910-12 at ages under 65, the fall in mortality having been greater amongst widows than either single or married (Table XXXIII). In order to show that when the risk of widowhood with its attendant higher mortality is taken into account, the apparent advantage of the married over the single condition still persists, the death rates of single women have been expressed below as percentages of the rates at the corresponding ages amongst the combined population of married and widowed, both from all causes and from non-puerperal causes.

	15-	20-	25-	30-	35-	40-	45-	50-	55-	60 & up.
1911-20:										
All causes ..	55	82	91	103	102	109	112	109	106	94
Non-puerperal ..	84	103	108	118	114	114	112	109	106	94
1930-32:										
All causes ..	60	92	106	111	106	115	115	105	103	91
Non-puerperal ..	93	120	131	131	118	121	115	105	103	91

There is an excess mortality from all causes in the single over the married and widowed at ages 25-60, reaching 15 per cent. at 40-50, and when puerperal causes are excluded there is an excess at ages 20-60, exceeding 30 per cent. at 25-35.

The comparative risks of mortality to married and single may be usefully expressed by the use of a simple form of standardized rate or "equivalent average death-rate".* The populations of single and married present such widely different distributions over the age-scale that, although the population of all women over 15 might be used as a standard, it is simpler and equally useful to postulate a standard population uniformly distributed over the scale of ages between defined limits. Standardized rates of mortality

* G. W. Yule; Journal of Royal Statistical Society, 1934. xcvi, Pt. 1, 15.

between any two ages can then be found by simply calculating the arithmetical mean of the rates at individual years between these ages, or of the rates in quinquennial age groups. If we compare 100,000 married women with the same number of single women aged 15-55 and uniformly distributed over those ages, it follows from Table XXXIV that the numbers dying annually would have been,

in 1911-20	{	672 single women (4 from puerperal, 668 from other causes).
		661 married women (70 from puerperal, 591 from other causes).
in 1930-32	{	486 single women (3 from puerperal, 483 from other causes).
		462 married women (50 from puerperal, 412 from other causes).

Stated in this way, the 100,000 married women would annually suffer in 1930-32 an excess of 47 deaths from puerperal causes (66 in 1911-20), but since 71 fewer would die of other causes (77 in 1911-20), they would enjoy a net advantage amounting to 24 survivors in the year (11 in 1911-20). The deaths saved by a fall in birth rate among married women (from 173 to 122 per 1,000 aged 15-45) totalled 20 of these 100,000 married women, since 70 died from puerperal causes in the first period and 50 in the second, so it may be presumed that even if their birth rate were to return to 173, the married would still enjoy a total survival advantage over the single.

It has been generally supposed that the greater vitality of the married than the single, as evidenced by their lower mortality from non-puerperal causes between ages 20 and 50, is due in large part to the operation of selective recruiting for wedlock. In the words of the Review for 1923 (p. 42) "Women suffering from mortal disease will frequently refrain from marriage, as from migration, and remain to swell the mortality of the ranks from which transfer for them is barred." This factor must be particularly important at the earlier ages when tuberculosis bars many from marriage, but any form of mortal illness which either stands in the way of marriage being contemplated, or prevents it after it has been arranged, virtually results in the transfer of a death from the married to the single group.

It is difficult to explain by selection of this kind, however, why in a period of rapidly falling incidence of most forms of mortal disease, the advantage as regards mortality from non-puerperal causes for the married over the single should have increased at ages 20-25 from 4 per cent. in 1911-20 to 17 per cent. in 1930-32, at ages 25-30 from 9 per cent. to 24 per cent., or at ages 30-35 from 17 to 25 per cent. There are, of course, a certain number of deaths associated with pregnancy or childbirth which are assigned to other causes and yet are contributed to by the puerperal condition, and

with a falling birth rate these too will have diminished to a greater extent for the married than the single. It is estimated, however, that if we make the extreme assumption of regarding every death associated with the puerperal state as due to maternal causes, the excess of the death rate unconnected with childbearing of the single over the married must then have increased from about 12 per cent. in 1911-20 to 31 in 1930-32 at ages 20-25, from 17 to 43 per cent. at 25-30, and from 26 to 41 per cent. at 30-35, so the explanation is not to be found here. There are as yet few signs to suggest that the development of the eugenic conscience has been operating upon selection for wedlock to such an increasing extent as to account for this, and it is difficult to escape the conclusion that in the present state of society the married condition *per se* for women is more favourable to vitality than the single condition at ages up to 60. Whether this is a matter of endocrine balance, psychology, economic and environmental differences, or all of these, cannot be decided, nor just what proportion of the handicap of the single women is due to these causes and what proportion to selection, but the plain fact that the risk of dying between ages 25 and 60 is smaller for the average married woman than the average single woman in the population, despite the risks attendant upon pregnancy and childbirth, is one which might usefully be stressed as a corrective to exaggerated fears of maternity.

CAUSES OF DEATH.

The causes of death of males and females at 18 groups of ages are stated in Table 21 for the whole country, and in Table 22 further detail of age is shown for all causes of significance at ages 0-5. In Table 23 deaths from each cause distinguished are tabulated by month of occurrence and by sex (but not by age). Table 23 differs from all others in referring to date of occurrence and not of registration. Table 21 includes the full International List of causes of death, as revised in 1929. The information as set out in this table is also available for London, and for the county borough, urban district and rural district aggregates of England and Wales. Certain of the numbered items in it are subdivided, and where this occurs the letters (a), (b), &c., indicate subdivisions in international use, and numbers (1), (2), &c., subdivisions made without international agreement. All other abstracts of the causes of death are arranged in the form of the short list of causes adopted by the Registrar-General in consultation with the Ministry of Health for use during 1931-40. The relation of this list to the detailed International List, as revised by the International Commission in 1929, is shown at the head of Table 24.

The contents of every heading in both the short and the detailed list now in use are defined in the Registrar-General's "Manual of

the International List of Causes of Death" (1929 Revision),* which should be consulted in all cases where it is desired to ascertain the precise significance of any heading in the lists.

Where two or more causes of death are jointly stated, the classification of the death to one or other of the causes in the International List is carried out in conformity with rules of selection, whose general principles are laid down in the Manual. Thus, with certain exceptions, deaths from violence associated with disease are classed to the appropriate violent cause, and deaths from an infectious disease associated with a local disorder such as a cardiac or renal lesion are classed to the infectious disease. Deaths are therefore not always classed to the immediate cause, but in some instances to a more remote one leading up to it. These rules for selection have not been seriously modified since 1901, so that continuity in the resulting tabulation has been maintained. Sufficient understanding and experience of the new form of certificate, introduced in 1927, has first to be gained before replacing the code of selective rules by the expressed opinion of the certifier. However desirable it may seem to make the change at once for certain combinations of causes, the importance of safeguarding the continuity of the statistics of causes of death must outweigh such considerations until the quality of certification is such as to justify reliance upon the order of statement for all combinations of causes. Special secondary tabulations according to the associated cause are made for deaths connected with anæsthetics, alcoholism and childbearing.

In Table 24 deaths are shown for the several geographical regions of the country, for urban and rural portions of administrative counties, and for county and metropolitan boroughs, arranged by sex, age, and the short list of causes as set out at the head of the Table. The same information, though not by age, is also available for each individual administrative area.

In addition to the above tables, which relate exclusively to the year 1933, Table 6 contains a statement of the number of deaths registered in each year 1923-33 from each cause distinguished in Table 21 so far as available, with distinction of sex but not of age; while Table 7 states the corresponding crude death-rates per million living for persons, males and females, so far as these can be regarded as of any significance, no rates being shown for causes which give a rate of less than five per million population. But the crude rates in Table 7 are liable to be misleading as indices of the progress of mortality even where their numerical basis is adequate. Owing to the rapid ageing of the population at the present time as a result of simultaneous fall in birth and death-rates the rates shown in Table 7 for causes mainly affecting old people tend automatically to increase, and thus to overstate mortality from such causes as cancer, cerebral hæmorrhage and heart disease. As this overstatement had become

* Copies may be obtained from H.M. Stationery Office. Price 3s. net.

seriously misleading in many cases, Table 8 was inserted to correct it by showing the course of mortality from each cause dealt with when allowance is made for such population changes by standardization (see page 1). Owing to the clerical labour involved in the preparation of these rates the list of causes in Table 8 is much shorter than that in Table 7, and rates are shown only for males and females separately. Standardized rates for both sexes jointly are given for a few causes in Table 9. Tables Nos. 11 and 12 state the mortality during the eleven years 1923-33 of infants under one year of age from the causes of chief importance at that age, but without distinction of sex.

1, 2. Typhoid and Paratyphoid Fevers.—The number of deaths classified to this heading during 1933 was 222. Of these, 39 were ascribed to paratyphoid infection, the same number as in 1932, forming 18 per cent. of the total compared with 19 per cent. in the preceding period of 5 years.

The standardized rates corresponding to these deaths, 5 per million persons living (Table 9), 6 for males and 4 for females (Table 8), are the lowest recorded.

Table 9 shows that this rate is quite trifling compared with those of earlier years, the rate for 1871-75, for instance, having been 371 per million, or over 70 times that for 1933.

The distribution of this mortality throughout the country is outlined in Table XXXV.

The highest mortality rate in 1933 for any region is that for Midland II. North II follows next, and Wales and London's outer ring show the lowest rates. Excess of mortality in the small towns had been the general rule during the preceding twenty years, but in 1933 the rural districts outside Greater London had a rate of 8 per million, the small towns 6, and county boroughs 4.

Prevalence (Table 26) in England was 4 per 100,000 living, the lowest rate recorded, but in the Administrative Counties of Wales the rate of 3 per 100,000 was slightly above the lowest rate of 1932. The fatality rate (Table XXXVI) was above the rates of the 3 preceding years. The distribution throughout the various regions in 1933 is also shown in Table XXXV.

Prevalence was highest in North I and Midland II and lowest in Wales I. Fatality was highest in Midland II. The proportion of paratyphoid to total notifications ranged from 19.0 in Wales to 27.0 in the Midlands, 28.6 in the South West, 32.3 in the East, 39.6 in the South East and 47.0 per cent. in the North.

The highest mortality rate recorded in Table 10 is, for counties of over 100,000 population, 103 per million in Northants and 35 in Yorks, East Riding. The county boroughs with highest rates are Northampton (83), Barrow-in-Furness (46), Eastbourne (35), Barnsley and St. Helens (28).

Table XXXV.—Typhoid and Paratyphoid Fevers; Mortality, Prevalence and Fatality at all ages. Measles and Whooping Cough; Mortality at ages under five years, and Proportion of Deaths occurring in the First One or Two Years of Life, 1933.

	Typhoid and Paratyphoid Fevers.			Measles.		Whooping Cough.	
	Deaths per million living.	Cases† per million living.	Deaths per 1,000 cases notified.	Deaths per 100,000 living at 0-5.	Deaths at 0-2 per cent. of those at all ages.	Deaths per 100,000 living at 0-5.	Deaths at 0-1 per cent. of those at all ages.
England and Wales	6	44	126	58	59	74	44
South-East ..	4	46	85	19	47	78	45
Greater London ..	4	46	85	19	52	88	42
Remainder of South-East ..	4	45	86	18	40	62	51
North ..	6	43	141	92	61	78	41
North I ..	8	89	90	106	57	59	49
" II ..	9	43	200	39	62	74	47
" III ..	5	28	173	45	55	78	36
" IV ..	6	35	158	126	64	88	40
Midland ..	9	44	199	65	62	58	47
Midland I ..	5	32	145	65	59	55	47
" II ..	17	69	247	65	70	63	48
East ..	6	53	113	24	43	69	40
South-West ..	5	42	128	28	51	66	55
Wales ..	2	25	63	104	57	91	50
Wales I ..	1	17	63	121	59	102	48
" II ..	3	45	65	51	41	61	63
County boroughs* ..	4	32	140	112	63	79	41
Other urban districts* ..	6	43	146	51	56	64	49
Rural districts* ..	8	61	128	19	39	68	48
Greater London :—							
Admin. County ..	6	43	137	31	54	111	42
Outer Ring ..	2	50	39	7	43	66	42

* Excluding Greater London. † Including cases in Port Sanitary Districts.

6. Small-pox.—The deaths allocated to this cause numbered 2, a smaller number than in any of the preceding fourteen years. The mortality record for this disease is contained in Table 9, which shows that the standardized rate for 1933 was less than 0.5 per million, indicated by 0 in the table, as in sixteen other years since the 1901–05 epidemic. In the remaining eleven of these years the rate has been one per million.

Of the 2 deaths classed to small-pox, one was a male child of 2 years with acute miliary tuberculosis and smallpox, the other a male aged 52 years.

The type of disease prevalent in 1933, though not specified in the records, is indicated by the low fatality rate of 3.2 per 1,000 notified cases (Table XXXVI). Since 1923, when it suddenly fell from 27.7 to 2.8 per 1,000 cases, the rate has shown but slight fluctuations—between 4.3 in 1928 and 1.5 in 1932.

The notified cases numbered 631, compared with 2039 in 1932 and 5,664 in 1931, and of these 604 occurred in Greater London, 9 in the remainder of the South East, and 9 in Lancashire.

7. Measles.—The deaths registered from this cause numbered 1,937 corresponding to a mortality of 48 per million population. But allowance for decreased proportion of children in the present population increases the rate on standardization from 53 to 76

Table XXXVI.—Fatality of certain Infectious Diseases (Deaths per 1,000 Notified Cases), 1911–33.*

Year.	1. Enteric (typhoid and paratyphoid fever).	6. Small-pox.	8. Scarlet fever.	10. Diphtheria.	15. Erysipelas.	16. Poliomyelitis (including polioencephalitis).	17. Encephalitis lethargica.	18. Cerebro-spinal fever (meningococcal meningitis).
1911	174	78.0	18.1	103	39	?	?	?
1912	191	73.2	18.6	96	39	?	?	?
1913	182	87.0	16.1	88	35	283	?	1,089
1914	194	61.5	17.2	99	42	348	?	1,257
1915	199	141.3	18.6	107	46	331	?	630
1916	174	113.2	17.8	101	39	270	?	656
1917	205	333.3	15.3	100	43	469	?	663
1918	201	30.8	20.5	106	47	1,004	?	673
1919	147	77.6	14.7	90	42	297	533	727
1920	171	114.1	12.0	81	52	404	539	911
1921	158	15.9	9.5	72	55	314	493	1,007
1922	191	27.7	12.7	78	53	352	742	1,047
1923	140	2.8	11.6	68	50	185	517	934
1924	120	3.5	10.5	60	52	183	279	746
1925	139	1.7	10.8	58	57	370	520	876
1926	133	1.8	8.3	59	55	181	583	926
1927	103	3.2	6.8	52	56	203	713	911
1928	124	4.3	5.7	52	55	306	819	1,061
1929	133	3.6	6.0	55	58	263	999	882
1930	106	2.4	6.7	47	56	212	1,241	938
1931	110	1.6	6.6	53	66	247	1,471	650
1932	101	1.5	6.2	54	68	237	1,493	568
1933	126	3.2	5.6	56	66	253	1,887	556

* The rates in this table are given with reserve, being in some respects unsatisfactory. For the years 1911–13 cases of disease among non-civilians have been excluded from the notification returns, but it has not been possible to distinguish their deaths; for the years 1920–1925 inclusive both cases and deaths relate to civilians only; for all other years the figures relate to the total population.

The numbers relating to small-pox in some years are too small to yield significant rates, but their basis of fact can be ascertained from Tables 6 and 28, and the rates quoted serve to bring out the extremely mild type of disease prevalent in 1921–33. The rates for poliomyelitis include polioencephalitis, which was not distinguished in the notification returns until 1919. The extraordinary rise in 1918 is partly ascribable to certification of a number of deaths from the then "new disease," encephalitis lethargica, as polioencephalitis, but mainly to a reduction in notifications unaccompanied by significant change in the number of deaths (see Report for 1918). The rates from this disease will be found to differ from some of those published in the Annual Reports of the Chief Medical Officer of the Ministry of Health, partly because polioencephalitis is included throughout and partly because special inquiries made by the Ministry in certain years have led to revision of the returns for those years, which is not embodied in Table XXXVI. The cases there referred to are similar for each year dealt with, being in all cases derived from the published notification returns. The latter source of discrepancy applies also to cerebro-spinal fever, and in this case there is a possibility that some cases of posterior basal meningitis may not have been notified as cerebro-spinal fever though all such deaths are included in the table.

for males and from 44 to 71 for females, each of these rates being the lowest ever recorded. The death-rate for children under 15 years of age, 201 per million, is seen from Table 9 to be also a low record.

The distribution throughout the country of mortality from measles is stated in Table XXXV in the form of death-rates per 100,000 living at ages 0-5. Deaths at these ages in 1933 formed 88 per cent. of the total, and statement in this form prevents the comparison being prejudiced by varying proportions of children in the populations compared. Measles was not epidemic in London and produced the lowest death rate yet recorded in that County. The regions showing the highest rate were North IV and Wales I.

The Table also demonstrates to what an extent measles mortality is enhanced by urban conditions, the county borough rate of 112 being almost 6 times that in the rural districts, a similar gradation with urbanisation having been evident in each of the 23 years for which the facts are available. The proportion of deaths which occurred at ages under 2 years also increased from 39 per cent. in the rural districts to 63 per cent. in the county boroughs, and was higher in the North, Midlands, Wales I and Greater London than in the less urbanised areas.

The relations of measles and whooping cough mortality at ages under 5 to latitude and to overcrowding were referred to in the Review for 1932 (Table XXVII and Diagram 2).

Table 10 shows that, of administrative counties with over 100,000 population, Glamorgan returned the highest death rate, 112 per million or more than twice the rate for England and Wales, Denbigh 109, Caernarvon 84, and Stafford 81, coming next. The highest county borough rates were—Liverpool 351, South Shields 307 and Birkenhead 293.

8. Scarlet Fever.—Deaths registered from this cause numbered 729, smaller numbers having been recorded in each year 1926 to 1929 and in 1931 and 1932. The rate at ages under 15, 63 per million living, was also greater than in those six years and 1917.

The progress of the decline from the maximum decennial rate of 1861-70 (Table 9) may be traced in the following statement of proportionate figures for subsequent periods, taking the rate of 2,617 in that decade as 1,000—1871-80, 729; 1881-90, 345; 1891-1900, 168; 1901-10, 119; 1911-20, 54; 1921-30, 28; 1931, 17; 1932, 18; 1933, 24. Thus the mortality of 1933 was less than one fortieth of that experienced 60 years earlier. The records of individual years since 1881 indicate that, ignoring increases which were not maintained over at least two years, the downward trend has been interrupted by short periods of rising rates which have failed to compensate for the preceding fall. Such periods were 1888-90, 1891-93, 1898-1902, 1911-14, 1917-20, and 1928-30, and

it is noteworthy that several of these were coincident with similar periods of increase in the diphtheria death rate (1891-93, 1912-14, 1917-20, 1928-30). Prevalence increased by 51 per cent. in 1933 compared with the preceding year, whereas mortality increased by only 37 per cent.

Table XXXVI shows that the fatality ratio of deaths to notified cases was 5.6 in 1933 compared with a mean rate of 6.2 per 1,000 cases notified in the preceding five years. This rate is less than one-third of that at the commencement of the record in 1911, when the notifications were first tabulated, scarlet fever and small-pox showing much the greatest declines of fatality in the Table.

The distribution of the disease according to urbanisation and geographical location is given in Table XXXVII. Increased prevalence compared with 1932 is recorded in every region, the percentage increase in the notification rate ranging from 11 in the

Table XXXVII.—Scarlet Fever and Diphtheria, 1933 : Mortality at Ages under 15 Years, Prevalence and Fatality at All Ages.

	Scarlet Fever.				Diphtheria.		
	Deaths per million living at 0-15.	Cases per 100,000 living at all ages.	Deaths per 1,000 cases notified.	Deaths at 0-5 per 100 at all ages.	Deaths per million living at 0-15.	Cases per 100,000 living at all ages.	Deaths per 1,000 cases notified.
England and Wales ..	63	321†	5.6	44	261	118†	56
South-East	62	358	4.7	38	253	125	47
Greater London ..	67	441	4.1	40	330	166	45
Remainder of South-East	53	230	6.6	34	134	61	54
North	90	384	6.6	51	352	140	64
North I	186	581	10.3	56	128	72	53
" II	33	270	3.4	33	427	165	70
" III	76	385	5.4	44	447	163	67
" IV	68	335	5.6	52	380	147	64
Midland	35	213	5.4	43	124	73	47
Midland I	43	234	5.7	44	125	77	47
" II	21	173	4.6	37	120	66	49
East	20	186	3.5	42	165	69	65
South-West	34	166	5.2	22	181	73	59
Wales	66	313	6.5	38	332	154	62
Wales I	72	381	6.0	40	334	155	62
" II	49	126	10.3	33	324	153	59
County boroughs* ..	72	340	6.1	50	338	148	58
Other urban districts*	69	298	6.5	41	200	84	62
Rural districts* ..	38	193	6.2	42	156	64	67
Greater London :—							
Admin. County ..	75	512	3.8	42	386	225	37
Outer Ring	58	366	4.5	37	275	105	63

* Excluding Greater London.

† Including Port Sanitary Districts.

South West to 91 in North I. In London there was a 57 per cent. increase in prevalence with a 9 per cent. fall in mortality. The death rate fell also in North II, Midland II, East and Wales I, but increased in the other regions.

The notification rate was greatest in North I, followed by Greater London, and lowest in Wales II, and showed the usual increase with urbanisation from 193 in the rural districts to 512 in London Administrative County. The fatality ratios were lowest in North II, East, and Greater London and highest in Wales II and North I. Outside London it was unaffected by urbanisation.

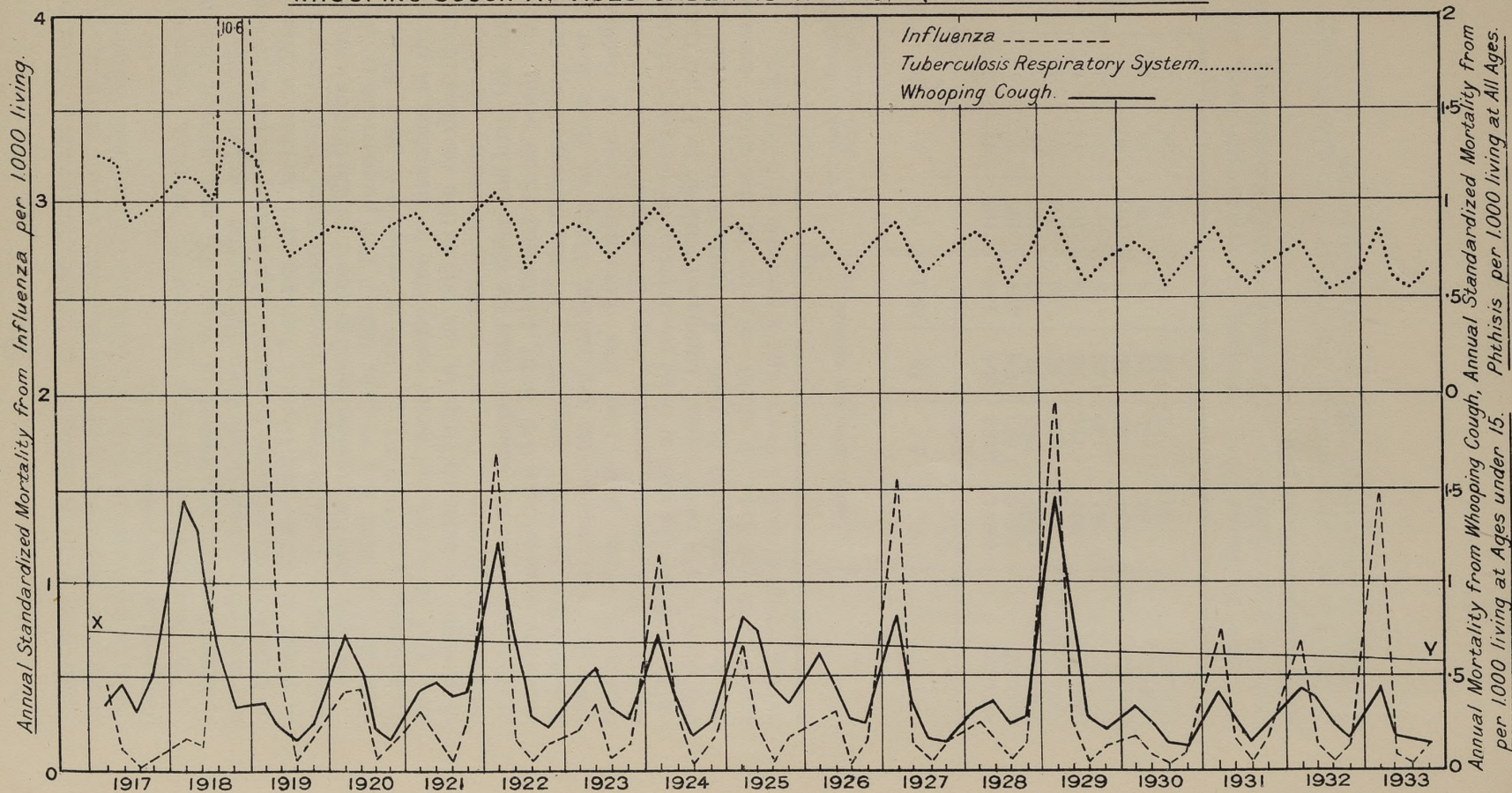
Children under 5 provided 44.2 per cent. of the deaths, compared with 45.7 in 1932 and 43.0 in 1931. The proportions in the six quinquennia from 1901-05, to 1926-30 were 60.6, 58.4, 54.0, 48.4, 48.6 and 42.4, this fall being partly due to alteration in the ratio of younger to older children in the population resulting from the declining birth rate. The rate of fall in mortality risk has been greater, however, for younger than for older children, the 1931-33 mortality rates at ages 0-5, 5-10, 10-15 and 15-20 being 1.9, 2.4, 3.6 and 5.9 per cent. respectively of the corresponding rates in 1861-70. The death-rates per million living at these four ages, tabulated below, show that this differential rate of decline in mortality risk was in progress from the beginning of the century up to 1926-30, the rate at 5-10 years being 68 per cent. of that at 0-5 years in the latter period, compared with 42 to 47 per cent. in the decades from 1861 to 1900. In 1931-33 this ratio has fallen again to 58 per cent., a slight increase in the mean death-rate having occurred at 0-5 years, and a decrease at 5-10 years.

	Death rates per million.				Per cent. of rate at 0-5 years.			
	0-	5-	10-	15-20.	0-	5-	10-	15-20.
1861-70 ..	4,644	2,193	504	153	100	47	11	3
1871-80 ..	3,504	1,522	326	104	100	43	9	3
1881-90 ..	1,667	763	154	42	100	46	9	3
1891-1900 ..	844	353	81	33	100	42	10	4
1901-10 ..	570	274	65	29	100	48	11	5
1911-20 ..	244	140	38	18	100	57	16	7
1921-25 ..	154	93	30	15	100	60	20	10
1926-30 ..	87	59	19	8	100	68	22	9
1931-33 ..	89	52	18	9	100	58	20	10

Table 10 shows that, amongst counties with over 100,000 population, mortality was highest in Durham (62 deaths per million) and Northumberland (46).

The highest rates amongst the county boroughs (average 20) are those of Sunderland (139) and Wakefield (133).

DIAGRAM 3. STANDARDIZED MORTALITY FROM INFLUENZA AND PHTHISIS, AND MORTALITY RATE FROM WHOOPING COUGH AT AGES UNDER 15 IN EACH QUARTER. 1917-1933.



9. **Whooping Cough.**—The deaths allocated to this heading numbered 2,270 (991 males and 1,279 females). The excess for females is shown by Table 6 to be a constant feature of this disease, and tends to increase with age. The percentage ratios of the numbers of female deaths to male deaths in 1933 are 114 at 0-3 months, 106 at 3-6 months, 113 at 6-12 months, and 122, 178 and 162 in the second, third and fourth years of life respectively, the ratios between the death rates being slightly higher owing to the excess of males at risk at these ages. An increasing female excess after 3-6 months, at which age the excess is scarcely appreciable when averaged over a period of years, has been a constant feature of the records of the last four decades.

The standardized death-rates, 76 for males and 100 for females (Table 8), are the lowest recorded except in 1930.

The death-rate per million living at ages under 15 reached a maximum of 1,511 for the five years 1866-70, after which, with a single exception, the quinquennial rates progressively declined to 387 in 1926-30. In 1933 the rate was 237 (Table 9).

The annual rate of mortality from whooping cough per 1,000 living under 15 estimated for each quarter in the years 1917 to 1933 is represented in Diagram 3, where the standardized death-rate from influenza is also graphically shown for the same quarters. In every year except 1917, 1921, 1923 and 1928 whooping cough mortality was maximal in the first quarter, and the mean secular trend of the March quarter rates is indicated by the straight line XY drawn through ordinates equal to the mean rate for the first 7 years (709) at 1920 and for the last 7 years (597) at 1930.

The March quarters when influenza was strongly epidemic, with a standardized death-rate exceeding 1 per 1,000 living, were those of 1919, 1922, 1924, 1927, 1929, 1933, and in 4 of these quarters whooping cough mortality surpassed the level of expectation XY. A study of the two graphs leaves little doubt that, apart from the similarities arising from the seasonal periodicity common to most infectious diseases, there is a relationship between the amounts of registered mortality from the two diseases occurring in the same quarters, and this is demonstrated more conclusively in the section on Winter Mortality in relation to Mean Air Temperature and Influenza Rate (*see* Diagram 7). The coincidence in the years of high mortality may be due to the presence of some factor affecting both influenza and whooping cough, but it seems more probable that the rise in whooping cough deaths, particularly noticeable in the March quarters of 1922 and 1929, was due to the epidemic transmission of respiratory infections secondary to influenza proving especially fatal to children already suffering from whooping cough.

The latter hypothesis receives support from the fact that the 1933 influenza epidemic, which was remarkable for the absence of any appreciable contemporaneous increase in mortality from bronchitis and pneumonia not attributed to influenza, was also not accompanied by increased whooping cough mortality.

There is no reason to suppose that whooping cough prevalence is affected by an influenza wave, and if only its fatality is affected little impression would be made upon the number of whooping cough deaths unless prevalence of both diseases happened to be high at the same time.

When whooping cough and influenza are mentioned jointly on a death certificate, precedence is usually given for purposes of statistical classification to the former, and the Table below shows the numbers of deaths assigned to whooping cough in each quarter during 1929 to 1933 with mention of influenza as an associated or secondary cause, and the proportions of these per 1,000 total deaths so assigned.

Quarter	Numbers of deaths.				Per 1,000 whooping cough deaths.			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
1929	66	3	—	1	19	2	—	2
1930	—	1	—	—	—	2	—	—
1931	7	1	—	—	7	2	—	—
1932	7	1	—	1	7	1	—	2
1933	24	1	1	—	22	2	3	—

The increase in whooping cough deaths due to a recognised double infection amounted to only 1.9 per cent. in the March quarter of 1929, which is scarcely appreciable compared with the total increase indicated in Diagram 3.

The distribution of mortality at ages under 5 and the proportion of deaths under 1 year of age are given in Table XXXV. The county borough rate of 79 was the lowest ever recorded and the increase of mortality with urbanisation was less evident than usual, although mortality in London was much higher than in the Outer Ring. The average rates of the 5 years 1926-30 and the annual rates since 1931 at ages under 5 are :—

	London.	County boroughs.	Urban districts.	Rural districts.
1926-30 ..	130	133	106	90
1931 ..	99	105	71	52
1932 ..	116	121	88	72
1933 ..	111	79	64	68

Wales I and North IV registered the highest mortality and Midland I and North I the lowest.

Wales II showed the highest proportion of deaths at ages under 1 year as in 1932.

10. **Diphtheria.**—The 2,646 deaths in 1933 include 1,291 males and 1,355 females. A female excess is shown also by the standardized death-rates (Table 8), as in each year since 1919 except 1922 and 1931, though the crude death-rate (Table 7) is generally higher for males. For 1933 the crude rates were 67 per million for males and 65 for females, and the standardized rates 88 for males and 92 for females.

The history of diphtheria mortality is best expressed by the death-rate from diphtheria and croup at ages under 15 in Table 9, for during last century much diphtheria was evidently returned as croup, and the larger proportional child population in itself tended to produce a higher crude death-rate at all ages. In 1861-65 this rate was 1,422 per million, but fell to 891 in the next quinquennium, and the 5-yearly rates then showed only slight fluctuations until the end of the century. The downward trend of annual rates since 1900 has been interrupted by short periods of increase. These occurred in 1912-14, 1917-20, 1924-26 and 1927-30, a contingent rise in scarlet-fever mortality occurring in three of these periods. The rate in 1933, 261 per million living under 15, is above that of the two preceding years. (Table 9.)

Table XXXVII shows that diphtheria mortality was highest in North III, followed by North II, and lowest in the Midlands and North I. For the country as a whole, outside London, the rate increased regularly with urbanization, and the London rate was also in excess of that for London's Outer Ring. It seems probable that diphtheria is still much more freely returned in some sections of the population than in others. Thus the frequency of its notification has been greater in London than in any of the regions or density aggregates separated in this table or its predecessors in each of the years 1916-33, with the exception of 1931 when the London rate was exceeded in Wales II.

The contrast between North I and the other Northern regions has been evident in each of the years 1931 to 1934 as shown below, and it is seen from these figures and from Table XXXVIII that

	Notifications per 100,000 living.				Deaths per million living at ages 0-15.			Deaths per 1,000 notified.		
	1931.	1932.	1933.	1934.	1931.	1932.	1933.	1931.	1932.	1933.
North I ..	64	51	72	160	136	67	128	62	41	53
North II ..	142	163	165	196	409	488	427	77	79	70
North III	119	131	163	276	371	330	447	79	64	67
North IV	141	147	147	196	372	379	380	66	64	64

North I has also been characterised in recent years by a low diphtheria fatality in comparison with the rest of the north of England.

Recent bacteriological research suggests that under present conditions the fatality rate of an outbreak of diphtheria is largely dependent upon the proportion of cases infected by particular strains of *C. diphtheriae* which may have a localised distribution. Table XXXVIII has therefore been introduced to show the trend, over a series of years, of prevalence and fatality indices in London, each county borough having a population exceeding 150,000 in 1931, and in the residue of each region surrounding these towns. Although local differences in the standard of notification of diphtheria may affect comparison of local rates in a given year, this factor is not likely to affect comparisons of the trend of prevalence or fatality in one town with the corresponding trend during the same period in another town. The rates for 1934 which have become available at the time of going to press have been included in the Table. There are wide differences, both as regards prevalence and fatality, between towns of similar size and situation, such as Manchester and Liverpool, or Leeds and Sheffield.

Fatality ratios exceeding 100 deaths per 1,000 notified cases were registered in 5 of the county boroughs distinguished in Table XXXVIII in 1926, these being Croydon, Bolton, Leicester, Nottingham and Plymouth; in 1927 this level was only reached in 3 (Sunderland, Bradford, Coventry), in 1928 in 2 (Bolton, Coventry), and in 1929 in 2 (Bolton, Bradford). In 1930 and 1931 Birkenhead and in 1933 West Ham alone gave ratios in excess of 100, and in 1934 Bolton and the region of North II excluding Kingston-upon-Hull. The distributions given below of the fatality ratios for the 36 areas distinguished in the table fail to show evidence of a bimodal character since 1930, although in 1926-29 the occurrence in some of the towns of outbreaks with fatality above the usual range seems to be indicated, the distributions in 1927 and 1928 being particularly abnormal.

	Fatality ratio.									
	0-	20-	40-	60-	80-	100-	120-	140-	160-	All.
1926 ..	1	2	12	8	8	4	1	—	—	36
1927 ..	—	7	10	16	—	2	1	—	—	36
1928 ..	2	9	11	12	—	—	—	1	1	36
1929 ..	—	5	14	13	2	1	1	—	—	36
1930 ..	1	11	18	4	1	1	—	—	—	36
1931 ..	2	8	14	6	5	1	—	—	—	36
1932 ..	3	9	11	10	3	—	—	—	—	36
1933 ..	—	11	11	9	4	1	—	—	—	36
1934 ..	—	8	11	13	2	2	—	—	—	36

In Table XXXIX all the county boroughs have been grouped according to their geographical situation by latitude and the per-

Table XXXVIII.—Diphtheria prevalence and fatality rates in Certain Large Towns and Regions, 1926 to 1934.

	Notified Cases per 100,000 living.									Deaths per 1,000 Notified Cases.								
	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.
England and Wales	131	133	155	159	184	126	108	118	170	59	52	52	55	47	53	54	56	59
South East : London Admin. County ..	296	271	275	268	303	195	188	225	281	40	32	33	30	34	31	38	37	40
Croydon C.B.	155	122	223	194	169	90	48	91	181	103	39	66	53	39	(24)	96	78	57
Portsmouth C.B.	407	310	360	317	255	151	97	77	136	70	65	61	33	27	35	(8)	(46)	86
Southampton C.B.	204	150	194	214	232	122	119	161	419	58	39	58	68	69	60	(9)	(31)	28
West Ham C.B.	221	302	342	265	282	120	105	182	291	19	42	32	48	40	31	40	105	61
Remainder of South East	113	124	161	156	168	102	65	74	124	53	52	57	59	47	50	51	56	59
North I :— Newcastle-on-Tyne C.B.	73	78	96	95	78	42	55	33	137	82	67	(30)	48	(18)	(51)	(32)	(96)	61
Sunderland C.B.	49	72	104	79	144	90	61	39	82	(88)	128	(11)	(62)	49	65	(44)	(41)	78
Remainder of North I	61	84	132	121	119	65	49	81	172	87	79	62	63	56	63	42	51	69
North II :— Kingston-upon-Hull C.B.	250	253	225	279	280	361	534	473	333	24	43	31	44	54	82	78	60	60
Remainder of North II	72	74	82	64	80	69	42	63	151	88	58	42	75	62	69	83	96	109
North III :— Bradford C.B.	114	116	97	139	117	82	106	129	288	58	103	68	122	55	(36)	45	39	52
Leeds C.B.	79	91	133	110	207	203	183	216	455	69	64	33	47	54	88	54	83	70
Sheffield C.B.	201	164	159	146	134	80	79	189	272	52	38	40	45	29	(14)	(15)	20	30
Remainder of North III	68	74	98	99	116	115	136	150	234	84	73	65	68	71	90	75	78	79
North IV :— Birkenhead C.B.	87	105	90	67	167	152	172	241	472	(51)	(48)	(42)	(29)	103	102	39	41	38
Bolton C.B.	66	79	61	40	45	25	24	60	54	121	71	153	(110)	(37)	(45)	(71)	(56)	116
Liverpool C.B.	175	191	218	267	462	375	384	340	338	72	52	52	58	59	59	56	60	61
Manchester C.B.	153	175	158	120	137	95	140	134	169	88	69	79	63	55	82	76	85	65
Salford C.B.	215	204	173	288	317	257	329	350	414	38	46	24	56	41	53	30	30	30
Remainder of North IV	85	97	99	113	124	98	91	96	155	75	63	68	67	63	68	77	69	74
Midland I :— Birmingham C.B.	247	211	218	238	235	178	117	83	156	50	31	33	36	37	35	30	38	53
Bristol C.B.	186	169	153	289	369	207	134	157	182	62	49	28	57	27	37	41	34	23
Coventry C.B.	74	144	162	265	293	114	64	81	108	(53)	113	168	88	85	57	(27)	74	65
Stoke-on-Trent C.B.	93	83	111	97	91	75	59	85	104	90	48	(19)	40	39	81	(31)	(30)	(21)
Remainder of Midland I	100	95	112	126	148	101	64	61	116	80	78	71	61	49	57	62	55	63
Midland II :— Leicester C.B.	152	127	188	104	83	47	32	140	192	106	35	41	51	(30)	(53)	(92)	38	43
Nottingham C.B.	238	355	346	259	255	99	51	56	76	108	66	47	83	50	(15)	(66)	(38)	(28)
Remainder of Midland II	95	94	115	116	155	80	59	58	72	67	70	65	74	50	58	65	54	56
East	53	61	133	126	107	86	78	69	66	52	65	51	64	59	67	64	65	72
South West :— Plymouth C.B.	152	197	217	264	318	191	212	165	186	116	62	76	48	37	46	45	53	45
Remainder of South West	47	46	81	113	159	82	66	63	70	49	63	59	69	56	51	52	61	55
Wales I :— Cardiff C.B.	108	179	248	328	321	264	221	215	235	66	37	28	41	40	41	20	40	40
Swansea C.B.	151	122	239	266	290	289	190	172	200	57	70	41	39	23	23	(29)	(32)	(24)
Remainder of Wales I	142	123	163	179	238	163	136	144	215	66	64	70	71	52	57	62	72	82
Wales II	82	115	93	107	234	229	165	153	165	57	48	74	70	54	51	56	59	57

NOTE.—In London, notifications are transferred to the area of residence, but this is not the case in other towns.

NOTE.—Rates in parentheses are founded upon less than 10 deaths.

centage of their populations living at densities exceeding 2 per room in 1931, and the diphtheria mortality at ages under 15 during 1929-33 has been calculated for each group. Mortality bears no

Table XXXIX.—Mortality from Diphtheria under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
	50°-	51°-	52°-	53°-	54°-
0-	76	47	75	95	—
3-	77	86	102	82	—
6-	—	161	66	124	30
9-	121	103	29	143	67
18 and up	—	—	—	—	39
All densities	86	101	77	124	46

consistent relation to the latitude in which the town is situated, the most remarkable feature being the low mortality in the group of 10 most northerly towns, despite their unfavourable rates of overcrowding. The Lancashire and Yorkshire towns, which comprise most of the group in latitude zone 53-54°, exhibit a rise of mortality with increasing overcrowding index, and this is also evident for the Southern towns, but not for the Midland zone (52-53°).

Table 10 shows that the counties, with over 100,000 population, with highest mortality in 1933 were Denbighshire (134 per million), also highest in 1930, 1931 and 1932, Flintshire (132) and Mon-

Table XL.—Influenza [Mortality per million Population during the first 3 and last 9 months of each Year, 1921-33.

	January-March.	April-December.
1921	356	198
1922	1,854	133
1923	240	214
1924	1,322	213
1925	783	175
1926	298	206
1927	1,827	147
1928	332	152
1929	2,450	173
1930	225	94
1931	958	165
1932	926	131
1933	1,995	100

mouthshire (117). The highest rates among county boroughs (average 88) were those for Huddersfield (430), Dewsbury (336) and Wakefield (316).

11. Influenza.—The deaths assigned to this cause numbered 22,890, 10,926 of males and 11,964 of females. The resultant crude mortality rate of 567 per million is reduced on standardization, by allowance for the increased age of the population, to 432 (Table 9), 463 for males and 401 for females (Table 8). Since the pandemic of 1918-19 this standardized rate has been exceeded in 3 out of the 13 years.

Mortality in the March quarter of 1933 was exceptionally high, the crude rate, as shown in Table XL, having been exceeded since 1919 only in 1929, and the standardized rate (Diagram 3) only in 1922, 1927 and 1929. As Table XL indicates, mortality in the latter nine months of the year has been subject to much slighter annual fluctuation than that in the first quarter.

The distribution of influenza mortality throughout the country is indicated in Table XLI.

Table XLI.—Influenza ; Mortality. Encephalitis Lethargica and Cerebro-spinal Fever ; Mortality, Prevalence and Fatality, 1933.

	In-fluenza.	Encephalitis Lethargica.			Cerebro-spinal Fever.		
		Deaths per Million Living.	Deaths per Million Living.	Cases per 100 Cases Notified	Deaths per Million Living.	Cases per Million Living.	Deaths per 100 Cases Notified
England and Wales ..	567	20	11†	189	23	42†	56
South-East	491	14	8	177	17	31	55
Greater London ..	465	12	7	182	20	36	55
Remainder of South-East	533	16	9	172	13	23	54
North	610	27	12	227	36	68	53
North I	477	27	9	305	58	99	59
" II	626	21	17	123	25	46	54
" III	608	19	5	388	48	107	45
" IV	657	32	16	206	24	40	59
Midland	569	20	10	195	22	37	59
Midland I	582	21	13	160	19	26	71
" II	544	19	5	354	28	57	49
East	665	33	19	171	11	17	66
South-West	592	16	15	110	10	16	61
Wales	661	16	12	129	15	18	87
Wales I	662	15	11	145	14	20	71
" II	657	16	16	100	17	10	171
County boroughs* ..	585	23	13	178	31	56	55
Other urban districts*	595	22	11	203	21	38	55
Rural districts*	607	22	11	196	18	31	58
Greater Admin. Co.	520	12	5	230	27	53	51
London { Outer Ring	406	12	8	148	13	19	67

* Excluding Greater London.

† Including Port Sanitary Districts.

The highest regional rate is that for the East, followed by Wales and North IV, while the lowest rates are those recorded for Greater London and North I. Mortality generally was highest in the rural districts, decreasing slightly with urbanisation though the rate in London Administrative County was higher than in the Outer Ring.

In these respects the mortality from influenza contrasts with the incidence of the infantile epidemic diseases which follow an almost constant rule of increase with urbanisation. In 17 of the 23 years, 1911-33, for which comparison is possible, the highest mortality from influenza has been recorded in the rural districts.

The relation between influenza mortality of adults in mid-life and average density of persons per room in different classes of area is analysed in Table XLII, where the rates at ages 25-45 and 45-65 during the quinquennium 1929-33 have been calculated for aggregates of areas grouped according to these factors. London mortality attributed to influenza tends to be no greater in the Metropolitan Boroughs with high densities per room than in those with more satisfactory housing indices, but the county boroughs manifest a very definite increase in death-rate with increasing average density per room. It must be remembered that, as pointed out in the Reviews for 1931 and 1932, this grouping of the county boroughs

Table XLII.—Mortality from Influenza 1929-33 at ages 25-45 and 45-65 of Males and Females in different Classes of Area, when County Aggregates, County Boroughs and Metropolitan Boroughs are grouped according to the Mean Density of Persons per room in 1931.

Sex and Age.	Area.	Mean persons per room.							Mean persons per room.								
		.55-	.70-	.85-	1.00-	1.15-	1.30-	1.45-	All densities	.55-	.70-	.85-	1.00-	1.15-	1.30-	1.45-	All densities
		Rates per 100,000 living.							Mortality per cent. of that in England and Wales.								
Males 25-45	London ..	—	14	18	19	19	18	21	17	—	61	78	83	83	78	91	74
	County Boroughs..	20	22	26	31	35	—	—	25	87	96	113	135	152	—	—	109
	Other Urban Districts ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rural Districts ..	21	22	27	22	—	—	—	23	91	96	117	96	—	—	—	100
	All Areas ..	15	22	22	—	28	—	—	21	85	96	96	—	122	—	—	91
Females 25-45	London ..	—	14	13	14	12	12	10	13	—	82	76	82	71	71	59	76
	County Boroughs..	13	17	18	22	27	—	—	18	76	100	106	129	159	—	—	106
	Other Urban Districts ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rural Districts ..	14	17	22	17	—	—	—	17	82	100	123	100	—	—	—	100
	All Areas ..	17	18	20	—	20	—	—	18	100	106	118	—	118	—	—	106
Males 45-65	London ..	—	61	60	73	66	69	48	64	—	91	90	109	99	103	72	96
	County Boroughs..	61	72	74	87	74	—	—	74	91	107	110	130	110	—	—	110
	Other Urban Districts ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rural Districts ..	54	65	78	57	—	—	—	66	81	97	116	85	—	—	—	99
	All Areas ..	57	59	61	—	53	—	—	58	85	88	91	—	79	—	—	87
Females 45-65	London ..	—	49	46	42	47	48	65	47	—	100	94	86	96	98	133	96
	County Boroughs..	41	50	57	62	53	—	—	54	84	102	116	127	108	—	—	110
	Other Urban Districts ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rural Districts ..	43	45	60	47	—	—	—	47	88	92	122	96	—	—	—	96
	All Areas ..	45	46	43	—	50	—	—	46	92	94	88	—	102	—	—	94

according to density is closely correlated with northerliness of situation. The group with densities .85—.99 persons per room consists in the main of the Lancashire and Yorkshire industrial towns, and the most densely housed group consists entirely of Tyneside towns. The factors unfavourable to respiratory diseases which accompany industrialisation, such as smoke, fog and reduced effective solar radiation, are therefore involved, as well as the greater crowding and lower average winter temperature. The combined effect of these on influenza mortality is evidently greater at ages 25-45 than at 45-65.

In the small towns, apart from the higher rates in the .85—.99 per room zone, there is little evidence of association with housing density, whilst in the rural districts there is an increase in mortality with density at ages 25-45 for each sex, but little or no evidence of this at 45-65.

The proportion of deaths from influenza with stated respiratory complications (mostly pneumonia) was higher in 1933 than in any year since 1918-19 with the exception of 1929, in spite of the fact that the standardized mortalities assigned to bronchitis and pneumonia (without mention of influenza) were exceptionally low in 1933. The "sympathetic" increase during influenza epidemics of mortality attributed to respiratory and cardiac disease and other causes, without mention of influenza, is dealt with in a special section of this Review. (See pp. 94, 139, 140 and Diagrams 3 and 7). Table XLIII affords the means of comparing the varying proportions of deaths with respiratory complications in the several classes of area. It will be seen that the proportion is lowest in the rural areas and increases with urbanisation to a maximum in London.

Table XLIII.—Deaths from Influenza with stated Respiratory Complications (11a) per cent. of all Deaths from Influenza (11).

	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.
Oct. 1918-Mar. 1919	80	85	81	79	78
1926	61	70	67	58	55
1927	69	79	73	69	64
1928	64	71	68	62	58
1929	75	84	78	73	68
1930	63	73	67	60	57
1931	69	76	74	67	64
1932	68	77	70	67	63
1933	74	81	78	72	68

When influenza is jointly stated as a cause of death with certain other epidemic diseases, cancer, puerperal sepsis, acute abdominal crises, violent causes, and in most circumstances with tuberculosis,

venereal and post-venereal diseases, rheumatic fever and a few other causes, the death is classified as a rule to the cause other than influenza. That is to say influenza when associated with any of these causes is regarded for statistical purposes as having merely hastened or contributed to the fatal termination. Table XLIV gives the numbers of deaths assigned to the principal causes thus taking precedence over influenza in classification which were certified during 1929-33 with statement of influenza as an associated cause, and the per mille ratios of these numbers to all deaths classed to the causes in question. In 1933 there were 637 such deaths additional to the 12,890 deaths classed to influenza itself, that is, an addition of about 5 per cent., the corresponding additions in 1929 being 3 per cent. and in 1930-32 2 per cent.

Table XLIV.—Number and proportion of Deaths from certain causes with mention of Influenza as Associated Cause. 1929-33.

List. No.		No. of deaths with mention of associated influenza.					Per 1,000 deaths classed to the cause in question.		
		1929.	1930.	1931.	1932.	1933.	1929.	1930-32.	1933.
7	Measles	15	—	7	2	3	4	1	2
8	Scarlet fever	5	—	2	2	9	7	2	12
9	Whooping cough	70	1	8	3	26	11	2	11
10	Diphtheria	8	—	6	2	6	2	1	2
16	Acute poliomyelitis and polioencephalitis	3	—	2	1	1	21	7	5
17	Encephalitis lethargica	19	6	18	24	24	18	18	29
34	Syphilis (acquired)	7	2	6	—	3	5	2	2
80	Tabes dorsalis	12	1	5	7	6	14	6	8
83	General paralysis of insane	10	1	5	8	9	8	4	9
23	Tuberculosis of Respiratory System	372	53	192	117	365	12	4	13
24-32	Other forms of tuberculosis	27	7	19	9	12	4	2	2
45-53	Cancer	151	17	83	64	121	3	1	2
159	Premature birth	12	4	9	9	11	1	1	1
140	Puerperal or post abortive sepsis	5	—	—	5	8	4	2	8
163-171	Suicide	12	3	5	4	5	2	1	1
176-194	Accidental causes	6	3	6	4	4	0	0	0
	Total classed to causes other than influenza	770	105	391	277	637			
	No. classed to influenza	29,084	5,019	14,409	13,156	12,890			

The causes showing the greatest tendency to have influenza mentioned as an associated cause (the frequency of such mention exceeding 1 per cent.) were in 1929 acute poliomyelitis, encephalitis lethargica, tabes dorsalis, phthisis and whooping cough, in 1930-32 encephalitis lethargica, and in 1933 encephalitis lethargica, phthisis, scarlet fever, and whooping cough. Since the great bulk of the influenza prevalence in epidemic years is concentrated in the 3 months of the epidemic, the ratios *during the epidemic* would be several times the rates given in the table; thus in March quarters of 1929 and 1933 when influenza was epidemic, 5 and 7 per cent. respectively of the deaths certified as due solely or partially to

encephalitis lethargica had mention of influenza as an associated cause. On the other hand less than 1 per cent. of cancer deaths occurring during the epidemics of 1929 and 1933 had mention of influenza as associated cause, and in the statistics of the complete years the transfer of all such deaths from the cancer to the influenza heading would only reduce the cancer rate by about 1 in 500.

Tuberculosis deaths during 1929 and 1933 included 10 and 11 per 1,000 respectively with mention of associated influenza, but if the inquiry is confined to the March quarters, which were the epidemic periods of those years, the proportions were 24 and 31 per 1,000 respectively. In the 1918-19 pandemic the proportion during the December quarter of 1918 was 126 per 1,000. The effect of influenza in hastening death of persons suffering from phthisis is reflected during epidemics not only in these deaths with joint statement of cause but also in an increase above expectation of phthisis deaths without mention of influenza (*see p. 140*).

15. Erysipelas.—Deaths attributed to erysipelas numbered 1,191, 624 of males and 567 of females, corresponding to standardized death-rates of 30 for males and 25 per million for females. These rates attained their lowest level in 1923, 15 and 14 respectively, but in recent years mortality has increased (Table 8). It may be noted that a similar course has been followed by the standardized rates for carbuncle and boil (No. 151), which were higher in 1933 than in any of the preceding 15 years, having increased since 1924. The rates for diseases of the ear and mastoid, fatal cases of which are almost entirely infective, have also risen from 35 for males and 26 for females in 1924 to 50 and 38 respectively in 1933.

At ages under 5 the erysipelas death-rate per 100,000 living was 9 in 1896-1900, 8 in 1901-5, 6 in 1906-10, 4 in 1915-20, and 3 in 1923, but has risen again to 10 in 1933. In infants under 1 year the rate per 100,000 births fell from 33 in 1896-1900 to 11 in 1923, and has risen to 26 in 1932 and 40 in 1933. At ages 5-25 there has been no increase since 1923, the rates being only 4 per million, whilst at ages over 25 standardized mortality has increased from 22 to 34 per million for males and from 18 to 25 for females.

The notification rate, which rose from 32 per 100,000 in 1923 to 45 in 1929 and 1930 and then declined, again reached 45 in 1933 (Table 26). In London this rate reached 65, the highest since 1919.

16. Acute Poliomyelitis.—The increase in mortality and prevalence of this disease noticed in 1932 continued in 1933. Deaths, including those from acute polioencephalitis, numbered 202, compared with 178 in the preceding year. The standardized death-rate of 8 for males equalled the peak level reached in 1926, but for females the rate remained at 5 per million. The cases notified, numbering 714 of poliomyelitis and 83 of polioencephalitis,

were in excess of those in the five preceding years (Table 28). The seasonal distribution of these cases conformed to the usual type, prevalence being highest from August to October (Table 27).

17. Encephalitis Lethargica.—Deaths attributed to this disease numbered 815, 428 of males and 387 of females, yielding standardized death-rates of 19 per million for males and 16 for females. These are the lowest rates since 1923 (Table 8). The 432 notifications (Table 28) show a decline for the ninth year in succession, and are considerably less than deaths, yielding a fatality ratio of 1,887 deaths per 1,000 notifications, compared with 1463 in 1932. This ratio was 279 in 1924, and then rose in each successive year to 1,471 in 1931.

Table XLI shows that mortality was highest in the East and North IV, whereas in London mortality and more especially prevalence were, as usual, below the general average.

18. Cerebro-spinal Fever (*Meningococcal Meningitis*).—Deaths from this cause numbered 942. Of these 530 were of males and 412 of females, corresponding to standardized rates of 35.2 and 27.3 per million. These rates show a further decline from the high rates reached in 1931, the fall continuing at each age distinguished in Table XLV. At ages under 5 the rates were still in excess of those attained in the 1915-17 epidemic by 17 per cent. for males and 41 per cent. for females.

Table XLV.—Cerebro-spinal Fever, 1911-33: Mortality at Various Ages per Million Living and per cent. of that in 1915-17.

Year.	Males.					Females.				
	All Ages.*	0-5	5-15	15-25	25 and up*	All Ages*	0-5	5-15	15-25	25 and up*
Mortality rate per million.										
1915-17†	69.8	148.2	45.3	135.3	35.2	31.6	122.7	36.5	24.8	10.5
1931	54.7	218.7	51.2	54.1	17.5	37.2	172.6	45.8	17.4	9.3
1932	46.4	209.6	36.0	42.6	13.6	31.8	153.0	31.5	16.3	9.5
1933	35.2	172.9	26.7	28.5	8.8	27.3	139.5	27.6	12.9	6.4
Mortality rate per cent. of that in 1915-17.†										
1911-14†	17	43	26	4	5	31	45	24	16	14
1915-17†	100	100	100	100	100	100	100	100	100	100
1918	55	57	54	59	48	55	56	63	49	46
1919	39	64	49	28	24	51	56	52	46	39
1920	27	60	47	10	9	46	56	39	51	25
1921	21	52	28	5	11	36	50	28	28	21
1922	18	44	25	7	5	32	49	23	20	9
1923	13	31	19	3	6	27	32	27	29	11
1924	15	34	21	6	6	24	31	21	16	15
1925	18	44	29	6	4	29	39	26	19	14
1926	19	50	27	5	5	30	45	14	24	19
1927	24	63	30	6	8	34	44	37	19	18
1928	23	60	28	6	10	39	54	30	27	22
1929	33	83	38	14	11	50	71	45	27	18
1930	34	76	52	13	15	58	86	46	25	27
1931	78	148	113	40	50	118	141	125	70	89
1932	66	141	79	31	36	101	125	86	66	90
1933	50	117	59	21	25	86	114	76	52	61

* Standardized. † The rates used for 1911-14 and 1915-17 are mean annual rates for those years.

Notifications in 1933 numbered 1,695 (Table 28), this having been exceeded only in 1915, 1917, 1931 and 1932. The numbers in the preceding 5 years were 413, 667, 674, 2,216, 2136. The fatality ratio, 56 per 100 cases, is similar to that in 1932 (57) but is below that in recent years, the ratios in the 5 years preceding 1932 being 91, 106, 88, 94 and 65. In times of high prevalence, when attention is directed to the disease, notification statistics probably furnish a more complete record of the total number of persons attacked than at other times.

Prevalence was greatest from mid-January to the middle of March (Table 27), mortality being highest in February (Table 23).

The mortality distribution manifested, as in 1932, a higher rate in the towns than the rural districts, and in London than in the Outer Ring. Table XLI also shows that, as in the two preceding years, both mortality and prevalence increased in general from South to North, mortality being highest in North I, followed by North III and Midland II as in 1932, and lowest in the South-West and East. The fatality ratio of deaths to notified cases was in general lowest in the regions with greatest prevalence, and highest where the disease was least prevalent, which again suggests that notification is more complete during local epidemics.

Table XLVI indicates that during the quinquennium 1929-33 cerebro-spinal fever mortality amongst children under 15 years of age was greatest in the large towns north of latitude 53°, which corresponds roughly with the North region. When the towns of the northern zones are grouped according to their average density of persons per room, mortality increases with density of housing, and a similar association is evident for the southern towns, but not in the midland zone.

Table XLVI.—Mortality from Cerebro-spinal Fever under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
	50°-	51°-	52°-	53°-	54°-
0-	17	46	67	39	—
3-	86	68	73	64	—
6-	—	64	66	119	57
9-	80	131	12	122	72
18 and up	—	—	—	—	237
All densities	77	76	65	109	181

23-32. **Tuberculosis.**—The deaths assigned to tuberculous affections in the aggregate numbered 33,259—18,734 of males and 14,525 of females—399 less than those so classified in the previous year.

The standardized death-rate resulting from these figures, 799 per million persons (males 901, females 707), is the lowest yet recorded (Table 9), being 16 per million below the previous lowest rate in 1932, the male rate being 12 per million lower and the female rate 20 per million lower than in that year.

The improvement on the preceding year was limited, as Table XLVII shows, to ages under 25 and over 65 for males, and under 10,

Table XLVII.—Mortality from Tuberculosis (All Forms) per Million Population, 1912-14, 1931, 1932 and 1933.

All Ages	Crude Standardized	Males.				Females.				Persons.			
		1912-14	1931	1932	1933	1912-14	1931	1932	1933	1912-14	1931	1932	1933
		1,571	1,041	972	968	1,169	762	713	692	1,364	896	837	824
1,542	976	913	901	1,174	772	727	707	1,349	869	815	799		
0—	2,081	824	833	701	1,717	678	666	584	1,900	752	750	643	
5—	372	276	239	236	580	250	247	211	576	263	243	224	
10—	447	216	216	188	687	327	278	288	568	271	247	237	
15—	939	790	727	675	1,226	1,145	1,075	1,020	1,084	968	901	847	
20—	1,501	1,230	1,203	1,189	1,381	1,353	1,343	1,313	1,439	1,293	1,275	1,252	
25—	1,816	1,206	1,116	1,150	1,403	1,129	1,034	1,065	1,599	1,166	1,074	1,107	
35—	2,189	1,439	1,273	1,308	1,374	824	752	764	1,767	1,106	991	1,014	
45—	2,384	1,636	1,496	1,529	1,185	620	574	539	1,762	1,093	1,002	997	
55—	2,213	1,367	1,310	1,320	967	527	503	457	1,553	924	884	863	
65—	1,378	857	825	794	752	440	402	397	1,031	626	591	575	
75 and up	586	360	354	331	440	288	281	221	498	316	309	263	

Table XLVIII.—Mortality from Tuberculosis in 1933, per cent. of that in 1912-14 and 1922-24.

All Ages	Crude Standardized	Per cent. of 1912-14.			Per cent. of 1922-24.		
		Males.	Females.	Persons.	Males.	Females.	Persons.
		62	59	60	79	73	76
58	60	59	76	74	75		
0—	34	34	34	59	60	60	
5—	41	36	39	63	54	59	
10—	42	42	42	56	54	55	
15—	72	83	78	79	80	79	
20—	79	95	87	76	86	81	
25—	63	76	69	75	83	79	
35—	60	56	57	75	74	75	
45—	64	45	57	88	67	80	
55—	60	47	56	88	67	80	
65—	58	53	56	77	68	73	
75 and up	56	50	53	82	63	71	

15-25 and over 45 for females; it was most pronounced at ages under 5, at which ages the fall in mortality had been arrested since 1930.

Comparison with the latter year, a very favourable one when influenza was not epidemic, reveals a decline at every sex and age group except amongst males aged 20-25.

In Table XLVIII the mortality of the year under review is compared at each age with the rates of 20 years earlier, in 1912-14, and of 10 years earlier, in 1922-24. The rates of fall in mortality, expressed in each instance as percentages of the rate at the beginning of the period, (a) from 1912-14 to 1922-24 and (b) from 1922-24 to 1933, are compared below.

Ages.	Males.		Females.	
	(a)	(b)	(a)	(b)
0—	—43	—41	—43	—40
5—	—35	—37	—32	—46
10—	—25	—44	—23	—46
15—	—9	—21	+5	—20
20—	+4	—24	+10	—14
25—	—15	—25	—9	—17
35—	—21	—25	—25	—26
45—	—27	—12	—32	—33
55—	—32	—12	—29	—33
65—	—25	—23	—22	—32
75 and up	—31	—18	—20	—37

For children under 10 the relative fall was about the same in each decade, whilst at 10-35 the relative decline has been much greater during the last decade than in the preceding one. Males aged 20-25 and females aged 15-25 registered an increase in the first period followed by a greater fall since 1922-24, and at 25-35 for both sexes and at advanced ages for females the rate of decline as thus measured has been enhanced in the second decade. For males at ages over 45, however, the rate of improvement registered in the first decade has not been maintained.

It was pointed out in the Review for 1932 that the tuberculosis death rate of young adult females had not declined since 1914 to any satisfactory extent, the rate at ages 20-25 for 1930-32 being about 2 per cent. below the level of 1912-14. The 1933 rate shows a slight fall to 5 per cent. below that level or 14 per cent. below the 1922-24 level.

Mortality from respiratory tuberculosis of females aged 25-35 was found (Table XLII of 1932 Review) to have declined since 1911 in the large towns and administrative counties having low densities of population measured by the average number of persons per room in 1931, but not in those having densities exceeding .85 persons per room. Males aged 15-25 also registered an increase in mortality in the group of districts with highest rates of crowding.

Grouping together areas with over 1 per room average density, phthisis mortality of females aged 15-25 increased from 1911 to 1930-32 by 25 per cent. in the county boroughs and 21 per cent. in the counties, whilst in London with a mean density about 1 per room it increased by 16 per cent. At densities of .85-1 per room the towns showed no change and the counties an increase of 15 per cent. but at densities below .85 per room both showed improvement of the order of 20 per cent. On the other hand, at ages 25-45 the fall in mortality was not confined to the better housed areas, but occurred almost irrespective of density.

The 27,854 deaths from respiratory tubercle form 84 per cent. of the total allocated to tuberculosis, and 5.6 per cent. of those from all causes.

The distribution of this mortality by regions and by class of area as well as by sex and age is shown in Table XLIX.

Table XLIX.—Tuberculosis of Respiratory System : Mortality per 100,000 Living at different Ages in different Areas, 1933.

	England and Wales.	Greater London.	London Administrative County.	South-East excluding Greater London.	North.	Midland.	East.	South-West.	Wales.	County Boroughs outside Greater London.	Other Urban Districts outside Greater London.	Rural Districts outside Greater London.
MALES.												
All Ages—	82	93	110	70	87	79	59	67	82	104	71	53
Crude	73	80	93	62	78	71	55	60	77	92	63	49
Standardized	..	..	..	..	..	..	..	..	..	..	..	..
0—	9	8	10	4	13	9	3	4	8	13	6	6
5—	6	5	7	2	9	3	6	3	7	8	5	4
15—	79	75	78	57	88	79	63	66	111	99	72	61
25—	105	114	127	98	110	97	87	86	118	126	95	77
35—	123	126	149	120	131	120	95	122	105	156	108	86
45—	145	170	207	119	151	153	98	116	129	190	122	81
55—	123	158	207	107	130	115	73	77	113	160	100	66
65—	71	110	136	56	64	73	46	52	65	90	49	45
75 & up	27	44	52	31	23	21	25	27	10	26	22	23
FEMALES.												
All Ages—	57	55	58	45	60	60	54	48	79	69	53	46
Crude	56	51	54	44	59	58	54	48	82	67	53	46
Standardized	..	..	..	..	..	..	..	..	..	..	..	..
0—	7	6	9	5	10	6	4	4	6	10	6	5
5—	11	6	7	6	16	9	13	6	16	15	11	8
15—	105	93	99	69	115	111	92	84	173	129	99	82
25—	97	92	97	85	94	100	95	150	139	95	95	84
35—	71	67	65	63	73	76	69	56	88	84	65	60
45—	49	48	49	41	47	57	49	43	62	59	42	41
55—	40	38	43	34	42	42	43	43	43	48	35	36
65—	33	36	38	33	33	32	37	21	31	36	29	31
75 & up	15	20	20	16	14	9	12	19	11	15	13	13

The relation of phthisis mortality to urbanisation is manifested by the decline of the standardized rate for males from 92 per 100,000 in the county boroughs outside Greater London and 93 in London itself, to 49 in the rural districts. For females the effect of urbanisation is not so great, the rates being 67 in the county boroughs, 54 in London, and 46 in the rural districts.

The regional distribution indicates that for males the standardized rate is highest in Greater London, the North and Wales, whilst for females it is much higher in Wales than elsewhere, and below the general average in Greater London. For males this rate is lowest in the East and South West and for females in the South East outside Greater London. The Welsh rates are below the general average for children under 5, and for males over 35 and females over 65, but show a large excess at ages 15-25, amounting to 41 per cent. for males and 65 per cent. for females, and at ages 25-35, amounting to 12 for males and 55 for females. The favourable position of the South East excluding Greater London is also most manifest at ages 15-25, the male rate being 28 per cent. and the female rate 34 per cent. below the general average. The ratios of male to female mortality at ages over 25 present considerable contrasts in the various regions, as shown below.

Male mortality per cent. of female.

	15-	25-	35-	45-	55-	65-75
Greater London	81	124	188	354	416	306
South East (excluding Greater London)	83	115	190	290	315	170
North	77	117	179	321	310	194
Midland	71	97	158	268	274	228
East	68	87	138	200	170	124
South West	79	91	218	270	179	248
Wales	64	79	119	208	263	210

In each of the years 1931, 1932 and 1933, Greater London has given the highest ratio at 25-35 and 55-65, followed by the North or South East, whilst at 15-25 and 35-45 either Greater London or the South East have been highest, and at 45-55 and 65-75 either Greater London or the North. The lowest ratio has been evident in the East and Wales at 25-35 and 45-55, in Wales at 35-45 and in the East at 55-65.

Amongst counties of over 100,000 population the lowest rates were those of Derbyshire, 415, Wiltshire, 422, Buckinghamshire, 436; Norfolk, 438; Cheshire, 439 and Dorset, 442.

The highest county borough rates were those for South Shields, 1,376, Bootle, 1,308; Middlesbrough, 1,276; and Liverpool, 1,182. The Dewsbury rate, 466, was lowest.

The standardized death rate from tuberculosis of the intestines and peritoneum declined further (Table 8) for males to a new low record of 27 per million, whilst for females the rate of 28 was slightly higher than the lowest rate of 1932 (27). The standardized rates for tuberculosis of the nervous system, which had shown no tendency to decline from 1928 to 1931, declined to low records of 75 for males and 71 for females.

The rapidity with which non-respiratory tuberculosis mortality in general continues to fall may be gathered from the fact that during the eleven years covered by Table 8 the standardized rate for each sex has fallen without interruption, from 264 to 172 for males, or by 35 per cent., and from 235 to 148 for females, or by 37 per cent., the percentage decline for the respiratory form of the disease in the same period being 19 for males and 21 for females. The proportion of non-respiratory to total (standardized) mortality was 24 per cent. in 1923 and 20 in 1933.

When the county boroughs are grouped according to their latitude and the percentage of their populations living at densities exceeding 2 per room (Table L), the mortality rates from non-respiratory tuberculosis during 1929-33 at ages under 5, and at the school ages 5-15, are seen to be higher in the Northern zones than elsewhere, but to present no consistent correlation with the overcrowding index.

44 (1 and 2). **Vaccinia and deaths following Vaccination.**—Three deaths have been assigned to the heading of vaccinia in 1933, consisting of two male infants aged 3 and 4 months with vaccinia and a female aged 17 years with post-vaccinal encephalitis.

Table L.—Mortality from Tuberculosis, other than respiratory, under 15 years of age, 1929-33, in the County Boroughs distributed according to Latitude and Rate of Overcrowding, per cent. of that in all County Boroughs.

Age.	Per cent. at density exceeding 2 per room.	Degrees of North Latitude.				
		50°-	51°-	52°-	53°-	54°-
Under 5 years	0-	64	86	103	107	—
	3-	99	76	78	102	—
	6-	—	75	85	103	79
	9-	82	98	72	107	148
	18 and up	—	—	—	—	149
	All densities	91	80	84	105	145
5-15	0-	65	59	117	57	—
	3-	91	85	81	91	—
	6-	—	100	64	99	156
	9-	80	72	52	105	149
	18 and up	—	—	—	—	204
	All densities	86	84	76	99	186

Two deaths have been classed to the group "other sequelæ of vaccination" (44:2), a male aged 4 months with broncho-pneumonia* and a female aged 6 months with septicæmia, both following vaccination. The death of a male infant aged 2 months from meningitis occurring 3 weeks after vaccination had been performed but without evidence of causal association, was assigned to meningitis as cause. In each of the above deaths vaccination was mentioned on the certificate. The death, stated to be due to pulmonary œdema and acute encephalitis, of a female aged 54 who was found on inquiry to have also suffered from a post-vaccinal encephalitis many years before, was classed to No. 78(b).

45-53. **Cancer.**—The deaths ascribed to cancer during 1933 numbered 61,572—28,837 of males and 32,735 of females. For both sexes these numbers are the highest yet recorded.

Of these deaths 53,458 were referred to carcinoma, 2,741 to sarcoma, and 5,373 to "cancer" not otherwise defined. These are the largest numbers yet recorded for total cancer and for carcinoma, but not for sarcoma, which of late years has accounted for a somewhat smaller proportion, now 45 per 1,000, of the total cancer deaths than heretofore.

The standardized death-rate for males in 1933 amounts to 1,035 per million, and that for females to 973. In 1928 the increase in female mortality was arrested and the rate decreased each year to 966 in 1932, but again shows a slight rise in 1933. Table XLI,† in the 1927 volume, shows that the standardized rate for males first exceeded that for females in 1924, and since that date the excess has been maintained, increasing to 86 per million in 1932. In 1933 the male rate was below the high record of the preceding year, the rate for each sex being almost identical with that of 1931. The crude death-rate is seen from Table 7 to be still in excess for females to the extent of 69 per million living in 1933, compared with 123 ten years earlier, this being due to the greater age of the female population.

For sarcoma the crude rate is 68 per million as against 71, 71, 68, 66 and 69 in the five previous years. When standardized there is a considerable male excess, the rate being 63.0 for males and 45.2 for females in 1933.

The mortality from cancer as a whole is compared by sex and age in Table LI for England and Wales, with record of the degree of difference in sex mortality at the various ages.

At ages from 15 years up to 55 the female exceeds the male rate but from 55 years to the end of life the male rates are in excess, the maximum divergence occurring at 65-75 years. This female excess in middle age, greatest at 35-45, is associated with, and largely explained by, the special frequency at this age of cancer

* In Tables 6, 21, 22, 23 of Part I this death (occurring in March) was included with the vaccinia deaths (44:1) but should be transferred to No. 44:2.

† This table gives standardized death-rates from Cancer by Sex for each year 1851-1927.

of the uterus and of the female breast, which together account for a larger proportion of the total deaths of women from cancer at each age between 25 and 65 than at all ages jointly (see "Text" Volume of the Review for 1929, page 57).

Table LI.—Mortality from Cancer (All Sites), 1933.

	Mortality per Million.			Sex Ratio.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
	All Ages { Crude ..	1,490	1,559	1,526	976	1,022	1,000
Ages { Standardized ..	1,035	973	997	1,038	976	1,000
0—	36	33	35	1,029	943	1,000
5—	23	19	21	1,095	905	1,000
15—	41	44	43	953	1,023	1,000
25—	115	151	134	858	1,127	1,000
35—	452	731	603	750	1,212	1,000
45—	1,646	2,063	1,870	880	1,103	1,000
55—	4,604	4,141	4,359	1,056	950	1,000
65—	9,863	7,623	8,626	1,143	884	1,000
75—	14,427	11,668	12,738	1,133	916	1,000

The percentage share of the breast and uterus in the total cancer mortality of females, in 1933, was :—

All ages	0—	25—	35—	45—	55—	65—	75—	85—
	33.2	4.7	34.4	50.1	48.1	36.5	24.6	23.3

The mortality attributed to sarcoma, carcinoma and cancer undefined is distinguished in Table LII, other details of the deaths being shown in Tables LIV and LV. The rates for cancer undefined are lower than the average of the five preceding years at every age over 25 except for males aged 35–45, indicating increased precision in the statement of the type of cancer. Sarcoma rates are lower than in 1928–32 at ages 15–75 for males, and at 45 and over for females. Carcinoma rates show an increase at all ages over 25 for males, but for females there is a decline at 25–45.

Table LII also shows the trend of cancer mortality by sex and age since 1901–10.

The crude death-rate at all ages for males in 1933 is 93 per cent. and the female rate 52 per cent. higher than the respective rates in 1901–10, but if standardized rates are compared these excesses are reduced to 32 and 3 per cent. respectively. These great differences in the rate of increase as shown by comparing crude and standardized rates emphasise the desirability of restricting comparison to the latter. The standardized figures take into account the rapidly increasing proportion of elderly persons in the population and attempt to correct, though imperfectly owing to the wide divergence of the age constitution of the present population from that of the 1901 standard, the exaggerated impression conveyed when crude rates are compared.

Table LII.—Cancer Mortality in 1911–20, 1921–30, 1932 and 1933 per cent. of that in 1901–10. Sarcoma, Carcinoma and Undefined; rates per million in 1928–32 and 1933.

	Mortality per cent. of the rate in 1901–10.*				Mortality per million living.					
					Sarcoma.		Carcinoma.		Cancer undefined.	
	1911–20	1921–30	1932	1933	1928–32	1933	1928–32	1933	1928–32	1933
MALES.										
All ages—										
Crude	128	167	193	193	81	78	1,189	1,279	154	133
Standardized ..	114	128	134	132	66	63	858	880	111	92
0—	96	100	121	113	22	25	2	1	1	1
15—	107	112	120	100	33	27	12	12	2	3
25—	101	106	106	106	37	35	71	75	9	5
35—	102	101	102	109	69	63	324	350	36	40
45—	108	105	101	106	129	124	1,324	1,374	156	148
55—	114	121	123	118	215	201	3,961	4,015	497	387
65—	120	143	155	148	295	271	8,668	8,698	1,166	893
75 and up ..	124	162	179	183	314	319	11,950	12,661	1,652	1,447
FEMALES.										
All ages—										
Crude	114	135	148	152	58	58	1,280	1,368	159	133
Standardized ..	102	105	103	103	45	45	836	845	103	82
0—	100	111	121	121	19	20	2	2	1	1
15—	103	106	112	133	20	25	14	17	2	3
25—	92	94	94	89	25	26	121	115	12	11
35—	93	90	86	86	42	45	639	629	68	57
45—	98	92	90	89	88	84	1,812	1,812	203	167
55—	99	96	93	94	144	140	3,529	3,674	439	327
65—	107	116	112	114	189	177	6,683	6,731	876	715
75 and up ..	116	143	148	148	296	176	10,405	10,434	1,394	1,057

* The rates per 100,000 at 1901–10, 1911–20, 1921–30 and 1931 were given in Table XLII of the Review for 1931. The percentage ratios in this table are based upon rates per million, that is to say, upon an additional significant figure, and therefore differ slightly from those given in previous years.

The recent trend of the sex death-rates at the several age-groups over 25 is indicated below, the rates per million being expressed as percentages of the 1901–10 rate in each instance.

		1926	1927	1928	1929	1930	1931	1932	1933
Males	25—	108	108	113	111	102	107	106	106
	35—	96	102	103	104	107	102	102	109
	45—	106	104	105	102	106	106	101	106
	55—	122	120	121	119	116	119	123	118
	65—	145	149	149	149	152	153	155	148
	75 and up	164	167	172	181	178	173	179	183
Females	25—	96	95	98	93	90	89	94	89
	35—	88	90	93	87	88	87	86	86
	45—	91	90	93	89	88	92	90	89
	55—	97	94	94	93	94	93	93	94
	65—	120	116	118	122	117	114	112	114
	75 and up	142	148	152	156	157	149	148	148

Comparison of the last 3 years with the preceding years indicates a declining tendency in the rates for males aged 25–35 and females aged 25–45 and 65–75. Apart from annual fluctuations the rates

practice of many years past, every practicable effort is made, with the co-operation of certifying practitioners, to assign the deaths to the organs primarily affected, in order to obtain as true indications as possible of the incidence of the disease. It is well recognized, however, that for certain organs, especially the liver and lung, commonly affected secondarily to such a degree that the symptoms dominate any that may arise from the primarily affected organ, ascertainment of the latter may prove impracticable. Such exceptions are becoming more rare, due no doubt to improvement in diagnostic methods, an encouraging sign justifying the inclusion, in the notes to certifying medical practitioners which accompanies the book of death certificates, of the request that "the seat of primary occurrence should be returned in all cases where known."

The distribution of cancers of each individual site, according to the nature of the growth is given in Table LV. The percentage of cancers with nature undefined is, amongst the organs distinguished, highest for the liver, prostate, ovary and brain. The percentage of all cancers defined as sarcoma ranges from 79 for the bones and brain, 48 for kidney or suprarenal and 35 for the testis to 1 per cent. for the digestive tract and female breast.

The facts as to cancer mortality distribution by sex, age and site contained in Table LIV are summarized for each site in Table LVI, which compares total mortality in 1933 with the rates for other recent periods for the same sex and site. In this table the tendency to increase of mortality merely in consequence of increase in the proportion of persons at risk falling within those ages at which cancer chiefly occurs, as well as the tendency to female excess for the same reason, has been allowed for by standardization, so that all the rates quoted may be compared with one another.

The chief increases in 1933, over the previous year are, for males—lung 9·8 per million, intestine 2·6, bladder 0·5, pancreas, kidney and suprarenal 0·4, and for females—intestine 6·6, stomach 2·9, pancreas and ovary 1·6, breast 1·3, bladder 0·8, lung 0·4.

The sites showing at least 25 per cent. increase in mortality from 1911-20 to 1933 are, for males, the lung (426 per cent.), prostate (117), pancreas (94), gall bladder (60), kidney and suprarenals (55), intestine (44), testis (35), larynx (29), and breast (25), and for females the lung (151), pancreas (89), ovary and Fallopian tube (85), kidney and suprarenals (43), gall bladder (42), and intestine (29). Those showing a decline are the tongue, mouth, jaw, liver, mesentery and skin in both sexes, uterus, rectum, mediastinum and rodent ulcer in females and lip, oesophagus, penis and scrotum in males.

The rate for cancer of the *lung* in males was more than six times as great in 1933 as in 1901-10, and in females more than twice as great. Whilst the magnitude of the increase in both sexes suggests that improved means of diagnosis is partly responsible, the much greater increase for males than females requires some other explanation.

Table LVI.—Cancer Mortality : Rates per Million Population (Standardized) for the more important Sites for each Sex 1901-10, 1911-20, 1921-30, 1929, 1930, 1931, 1932 and 1933.

	Males. Females.		Males. Females.		Males. Females.		Males. Females.		Males. Females.	
	All Sites.	Lip.	Tongue.	Mouth and Tonsil.	Jaw.	Pharynx.	Oesophagus.	Stomach.	Liver.	Gall-bladder.
1901-10	784	942	12·8	0·8	43·1	4·4	?	?	22·6	6·9
1911-20	897	959	12·6	0·7	50·8	4·3	23·5	3·0	25·1	7·2
1921-30	1,004	986	11·5	0·7	46·1	3·8	28·3	3·6	20·8	6·4
1929	1,031	999	10·4	0·6	41·8	4·1	27·6	3·5	19·2	6·5
1930	1,031	987	11·3	0·7	40·6	3·5	29·3	3·8	16·7	5·3
1931	1,034	974	10·7	0·5	38·1	3·6	29·4	3·5	16·5	5·1
1932	1,052	966	10·3	0·6	37·6	3·4	21·2	2·4	16·6	5·2
1933	1,035	973	8·7	0·7	35·7	3·6	20·1	2·4	15·2	4·8
1901-10	?	?	51·2	14·6	167·2	133·0	?	?	?	?
1911-20	10·8	3·0	60·6	16·5	186·4	139·0	87·1	98·0	6·0	11·6
1921-30	12·6	3·0	64·2	18·1	221·1	155·5	61·0	60·9	8·8	16·6
1929	13·8	2·8	62·3	18·3	237·2	164·6	52·3	50·6	9·4	17·6
1930	11·8	3·2	61·8	18·6	233·7	162·8	47·7	45·4	9·5	17·1
1931	13·0	3·1	62·8	18·7	231·3	155·5	47·0	42·7	9·2	16·9
1932	14·7	3·4	62·5	19·5	233·3	153·8	45·7	38·9	10·8	16·9
1933	12·8	3·4	57·8	18·3	229·2	156·7	45·5	36·8	9·6	16·5
1901-10	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?
1911-20	6·0	12·0	96·8	109·2	93·6	59·3	—	24·3	—	174·4
1921-30	5·4	8·1	125·4	129·9	105·5	59·8	—	36·0	—	157·9
1929	4·4	7·2	134·3	138·6	108·0	58·3	—	40·8	—	150·3
1930	4·9	6·6	136·9	138·4	110·6	59·9	—	42·3	—	143·9
1931	5·3	6·6	136·1	136·3	109·1	59·5	—	42·7	—	139·9
1932	4·6	6·3	136·8	133·9	113·5	59·8	—	43·3	—	137·8
1933	3·9	6·0	139·4	140·5	111·1	56·5	—	44·9	—	134·5
1901-10	1·5	158·4	?	?	?	?	?	?	?	?
1911-20	1·6	170·8	6·7	4·3	6·6	—	2·4	—	17·6	10·9
1921-30	1·8	189·1	8·4	4·9	6·4	—	2·7	—	17·6	10·2
1929	1·8	195·7	9·5	5·0	5·7	—	2·7	—	18·2	10·7
1930	2·3	194·5	9·1	4·6	6·3	—	2·3	—	16·1	9·0
1931	2·3	200·2	9·0	4·7	6·5	—	2·6	—	17·5	9·2
1932	1·8	196·6	8·0	4·2	6·0	—	2·8	—	16·1	11·0
1933	2·0	197·9	7·2	3·9	5·7	—	2·3	—	15·6	9·9
1901-10	?	?	10·2	7·0	14·5	11·8	8·4	7·6	?	?
1911-20	23·9	6·0	12·7	7·0	16·7	13·1	9·1	7·2	28·2	9·7
1921-30	31·3	7·1	25·2	9·6	26·3	19·5	11·7	8·9	30·5	11·4
1929	31·4	7·6	33·4	11·9	30·3	20·0	13·2	9·6	32·3	12·3
1930	31·6	8·5	40·2	13·9	29·4	23·8	13·0	8·7	31·8	11·5
1931	31·7	7·9	51·2	16·3	28·8	21·6	13·9	9·5	34·2	11·0
1932	30·7	7·2	57·0	17·2	32·0	23·1	13·7	10·1	32·0	11·2
1933	30·8	7·1	66·8	17·6	32·4	24·7	14·1	10·3	32·5	12·0
1901-10	11·8	—	?	—	?	?	8·1	4·5	—	—
1911-20	26·5	—	4·9	—	15·7	12·0	9·2	4·6	—	—
1921-30	47·7	—	5·8	—	17·6	13·5	12·6	5·8	—	—
1929	56·4	—	5·2	—	17·6	14·6	12·1	5·6	—	—
1930	54·9	—	6·7	—	17·3	12·0	13·1	5·3	—	—
1931	56·4	—	5·9	—	16·5	11·7	11·4	4·6	—	—
1932	58·5	—	6·8	—	16·8	13·3	9·8	4·0	—	—
1933	57·4	—	6·6	—	16·4	13·0	9·8	4·1	—	—

The continued increase in mortality from cancer of the *prostate* has been accompanied by an increasing mortality assigned to non-malignant prostatic diseases which has risen by 51 per cent. since 1923 (Table 8). The rate of increase in the standardized mortality from cancer of this organ since 1911-20 is 63 per cent. at ages under 65, 120 at 65-75 and 168 at 75 and upwards.

Excepting the testis, breast and larynx for males all the sites mentioned above as showing high rates of increase are included in the group of inaccessible sites in the Review for 1926 (p. 66). It is therefore probable that these increases are, in some

measure, due to improvement in diagnosis, and in the case of cancer of the intestines, pancreas and gall bladder, to the continual transfer of certification from secondary cancer of the liver and mesentery and peritoneum to the primary site which has been in progress since 1901-10.

The increase in the mortality from cancer of the *larynx* and of the *rectum* for males may, in view of their greater accessibility, be more real than that from the other sites. The rate of increase for rectal cancer from 1911-20 to 1933, has been 19 per cent. for males but the rate has slightly fallen for females.

Mortality from cancer of the *breast*—the most frequent site in females and accounting for about one-fifth of their total cancer mortality—increased in 1911-20 by 8 per cent. over the previous decennium and in the next decennium the rate of increase was 11 per cent., whilst mortality in 1933 is 5 per cent. in excess of that during 1921-30. There has not, however, been any consistent change since 1928. Many cases of breast cancer followed after removal by secondary cancer of the liver were formerly certified under the latter description and the transfer of such deaths with improved certification doubtless accounts for the greater decline in the liver rate for females than for males and for part of the rise in the breast rate. The increase in standardized mortality from breast cancer since 1901-10 has been 25 per cent. at ages under 65, 18 at 65-75, and 35 at 75 and upwards. In so far as treatment only delays the fatal issue in many cases it must tend to increase the rates at later ages at the expense of those at earlier ages. It was shown in the Review for 1932 (Table LII and p. 72) that whilst mortality at ages 35-55 had increased from 1911-20 to 1930-32 by about 10 per cent. in married and single alike, at ages over 55 the increase had been much greater amongst the married than the single.

The fall between 1911-20 and 1933 of 23 per cent. in the mortality from *uterine* cancer—now the fourth site in order of frequency—is of great significance. No other site of similar importance shows such a decline for either sex. The extent of the fall increases from 25 per cent. at ages under 45 to 26 per cent. at 45-65, and then diminishes again. Analysis of 1930-32 mortality by marital condition (Review for 1932, p. 72) showed that whilst at ages under 45 mortality had declined from 1911-20 to 1930-32 to a greater degree amongst the married than the single, between 45 and 75 the relative improvement was almost the same in each group of women (about 25 per cent. fall at ages 45-65 and 13 per cent. at 65-75).

Mortality rates from cancer of the *lip*, *tongue* and *jaw* have declined almost continuously since 1911-20 for both sexes. The female mortality from lingual cancer is extremely low compared with the mortality among males. The male rate fell in 1933 for the sixth year in succession, the rate of 35.7 per million being only 70 per cent. of the mean rate in 1911-20.

The standardized mortality from syphilitic diseases (syphilis, tabes, general paralysis and aneurysm) in males also declined for the fifth year in succession, the rates per million in each year from 1927 being 161, 161, 153, 145, 143, 133, 126.

Cancer of the *ethmoid* has recently received attention owing to a suspected occupational factor in its causation. The precise point of origin of cancerous growths of the nose is not always ascertainable and an analysis has therefore been made of all deaths attributed to nasal cancer in males during 1933 (included in Nos. 45 and 53).

	All ages	0-	45-	55-	65-	75 and up
Ethmoid sinus or cells ...	13	2	2	5	2	2
Nasal bones or septum ...	5	1	2	2	—	—
Sphenoidal sinus or sphenoid ...	5	2	1	—	2	—
Nasal fossæ, nares, nostril ...	11	—	—	4	5	2
"Nose" (chiefly epithelioma) ...	17	—	1	3	6	7

The occupations were as follows, in order of increasing age at death within each group. First group: child, 2 nickel workers (42, 46), farmer, bedstead worker, excise official, army officer, tailors' cutter, shoe finisher, green-grocer, general labourer, awl blade maker, fire brigade officer. Second group: general labourer, gas-producer in nickel works, tram conductor, nickel worker, lithographic printer. Third group: general labourer, unoccupied, bus conductor, butcher, cabinet maker. Fourth group: corporation labourer, leather dresser, coal merchant, carpenter, farm horseman, lace draughtsman, railway engine driver, engineer's labourer, agricultural labourer, butcher, naval pensioner. Fifth group: shoe finisher, medical practitioner, general labourer, clerk, textile engineer, farm labourer, banker, commercial traveller, bobbin (lace) worker, carpenter-joiner, farm bailiff, transport worker, shoe finisher, unoccupied, architect, seaman, agricultural worker. The 4 deaths of men employed in nickel works were registered in Glamorganshire; the remainder were scattered throughout the country.

54. Tumours not returned as malignant.—As in other recent years all deaths from tumours not definitely stated to be malignant have been assembled in Table LVII. These numbered 3,086, the tumour being returned as benign in 1,803 instances, and its nature in the remaining 1,283 being unstated. The classification differs from that in use prior to 1931, as explained in the Review for 1931.

"Adenoma" of the prostate is classed to diseases of the prostate, No. 137, rather than to these headings because this condition seems to be scarcely distinguishable from that described as prostatic hypertrophy. Benign tumours other than adenoma or the varieties of it shown in Table LVII are classed to No. 54 (3 only in 1933) and tumours of unstated nature to No. 55. Mortality attributed to prostatic diseases is seen from Table 8 to have increased rapidly in the last decade, the standardized rate being 114 per million in 1923

and 162 in 1933. In 1933 a total of 6,134 deaths was assigned to No. 137, diseases of the prostate, No. 51, cancer of the prostate, and Nos. 54, 55, other or ill defined tumours, and of these deaths 26.6 per cent. were attributed to cancer, 4.8 per cent. to benign tumours and 68.6 per cent. to other conditions, chiefly hypertrophy.

The corresponding figures relating to 1922-24 and 1930-32 were incorrectly stated in the Review for 1932, but the conclusion drawn, that deaths attributed to non-malignant conditions have increased in recent years rather more rapidly than those attributed to cancer, was correct. The proportions calculated on the above basis for 1922-24 are 29.1, 4.4 and 66.5 per cent. respectively.

Deaths assigned to associated causes with "adenoma" of the prostate as a contributory condition, numbered 25, compared with 24 in 1931 and 29 in 1932, and of these 78 deaths 21 were classed to heart diseases, 13 to diabetes, 8 to arterio-sclerosis and 6 to kidney diseases.

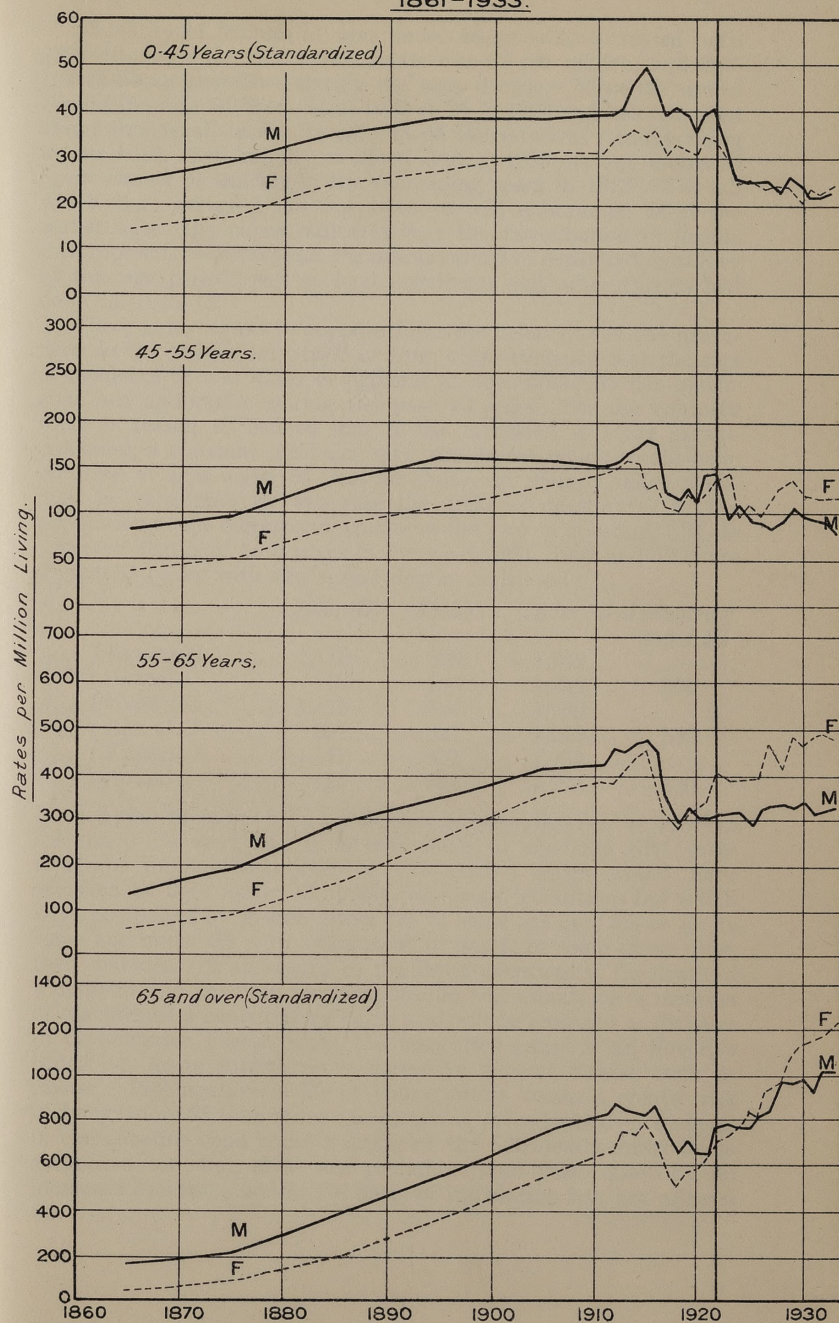
Adenoma of the thyroid is not included in this table, but is classed to No. 66 (a), Simple goitre.

Deaths ascribed to pituitary tumour have increased from 7 in 1913 to 57 in 1933. Deaths from tumour of the lung increased from numbers ranging between 11 and 21 during 1912-19 to 83 in 1932 and 74 in 1933. Like lung cancer, which has also increased rapidly (Table LVI), they affect males much more than females. The ratios of malignant to benign tumours of the mediastinum, lung, and abdominal organs suggest that large proportions of those returned as of unknown nature were probably malignant.

59. Diabetes.—The deaths allocated to this disease numbered 6,278, 2,460 of males and 3,818 of females, corresponding to standardized death-rates of 92 for males and 114 for females. This rate has been in excess for females in each year from 1923 onwards, whereas before that date excess for males was an invariable rule, though its amount had long been decreasing.

The trend of diabetes mortality since 1861-70 is represented in Diagram 4 for each sex. At ages under 45 male standardized mortality increased until 1891-1900, remained stationary until 1912, and then rapidly increased to 1915. The rates of the next 5 years, which relate to civilians only, were greatly influenced by selection, but from 1920 to 1922 the rate was again rising. The introduction of insulin in 1923 was accompanied by a drop from 41 per million in 1922 to 26 in 1924 and a further gradual fall to the present level of 23 (22 in 1931-32). At ages 45-55 male mortality behaved similarly; it remained stationary, about 160 per million, from 1891-1900 to 1913, fluctuated during 1914-20 and had not quite regained its former level by 1922. The following years witnessed a drop from 143 to a mean level of 88 in 1926-28 and 90 in 1931-33.

DIAGRAM 4 DIABETES MORTALITY IN ENGLAND AND WALES
1861-1933.



Mortality of females at ages under 45, steadily increased until 1901-10, when the standardized rate was 32 per million, and fluctuated about that level during the next decade. With the use of insulin the rate fell from 34 in 1922 to 25 in 1924 and has remained about that level since. At ages 45-55 the rate was steadily rising up to 1913, then rapidly declined during 1915-18 but increased again almost as quickly in the succeeding years to 1923. The fall which then occurred has not been so well maintained as at the earlier ages; the curve indicates that the introduction of insulin interrupted for several years the upward trend of registered mortality at this age period, just as food restriction and other factors had done in 1915-18.

There is no reason to suppose from the behaviour of the death-rates in the pre-insulin period or from other evidence that the rate of incidence of new cases of diabetes at ages under 55 has undergone any diminution during the past 10 years. On the contrary there is reason to believe that it has increased to some extent. Assuming a constant incidence rate, the deaths which would have occurred at ages under 55, had no change in therapy taken place, may be calculated by applying the 1920-22 death-rates to the population at the corresponding ages in the year in question. These expected deaths of both sexes in the years 1931, 1932 and 1933 are compared below with the actual deaths registered.

		Under 45	45-55	Under 55	Deficiency under 55
1931	Expected ..	1,112	630	1,742	
	Actual..	702	540	1,242	500
1932	Expected ..	1,116	634	1,750	
	Actual..	691	527	1,218	532
1933	Expected ..	1,117	637	1,754	
	Actual..	723	501	1,224	530

In each year there has been a deficiency of about 500 deaths from the calculated number, and it is reasonable to conclude that these represent minimal estimates of the deaths which would have occurred at ages under 55 under pre-insulin conditions but which were postponed by insulin either (a) to some age over 55, or (b) to some age under 55 with assignment of death to some cause other than diabetes. With regard to the latter eventuality, the death of a diabetic who has been receiving insulin will usually have mention of diabetes as a contributory cause and will be assigned to diabetes in classification except when the associated cause is an infective condition, acute intercurrent disease or general disease such as cancer. Prolongation of life of young adults means a greater risk of dying before 55 from those causes taking precedence over diabetes in classification, and some fraction of the 500 deaths must be so accounted for, but these are probably more than offset by an increased incidence which the basis of calculation has not allowed for.

If this is so, the number of deaths in defect, 530 in 1933, can be regarded as the excess of deaths postponed from the age group 45-55 to the group 10 years older over the deaths postponed from the group 10 years younger to the group 45-55. The expected deaths at 45-55 numbered 637, of which 530 or 83 per cent. were on this assumption postponed to an age group 10 years older, and from this it follows that the average lengthening of life of the diabetics who in the pre-insulin period would have died before 55 has been about 8 years. This estimate is an average for all diabetics in the population who would have died before 55, whether insulin treated or not, and it is similar to an estimate reached from clinical experience in the U.S.A.*

At ages 55-65 mortality steadily increased up to 1915 for both sexes, declined abruptly in the period of food restriction, and was again rising from 1920 to 1922 (Diagram 4). From 1923 onwards the male rate at 55-65 has not appreciably changed whilst the female rate has continued to increase. Standardized male mortality at ages over 65, which had not regained the 1911-14 level by 1922, remained stationary until 1925 and then rose rapidly to 1928, with a further increase in 1932. The rise in the corresponding female rate has been sustained with few interruptions since 1918.

The reasons for the continuous increase in death-rates attributed to the senile form of diabetes, due in part to rising incidence perhaps but in greater part to increasing recognition of the condition and mention of it on death certificates, has been frequently commented upon. Having regard to (a) the steep upward trend of registered diabetes mortality at ages over 55 from 1861-70 to 1915, when the period of food restriction resulted in a profound and prolonged interruption in this trend, (b) the transfer of deaths from earlier ages owing to postponement of the fatal issue by insulin therapy, and (c) the fact that for various reasons the new therapy is less frequently applied to diabetics of advanced age, it is not surprising that registered mortality at ages over 65 continues to increase. It can be shown that, if the death-rates at 55-65, 65-75 and over 75 had increased year by year since 1920-22 by the same mean annual increments as were operative during the undisturbed period from 1901-10 to 1915, the expected deaths at ages over 55 in 1933 would be 4,487. The actual deaths registered numbered 5,054, an excess of 567 which is approximately equal to the deficiency calculated above at ages under 55. The recent trend of the mortality rates could therefore be adequately explained by a transfer of deaths up the age scale (sufficient to postpone about 500 deaths in each year from before 55 to after that age), superimposed upon a resumption since 1921 of the pre-1915 trend of mortality rates at the various ages.

* Joslin, Dublin and Marks. Amer. J. of Med. Sci. 1934, CLXXXVII, 434.

Table LVIII.—Mortality from Diabetes in 1920-22 and in subsequent years.

	Standardized Rates.			0-	15-	25-	35-	45-	55-	65-	75 and up
	All ages	0-55	55 and up								
DEATH-RATES PER MILLION LIVING.											
Males:—											
1920-22 ..	93.7	47.9	477.5	14	42	60	69	133	309	661	772
1931 ..	88.1	29.5	580.3	12	22	30	38	97	315	821	1,161
1932 ..	92.4	28.9	625.6	10	21	30	45	93	320	897	1,310
1933 ..	92.3	28.5	628.2	13	26	30	36	80	325	888	1,326
Females:—											
1920-22 ..	90.1	43.1	483.9	16	35	48	62	124	355	656	632
1931 ..	110.9	33.4	762.0	11	26	31	45	121	473	1,097	1,218
1932 ..	112.4	32.5	783.3	13	20	29	46	118	485	1,143	1,219
1933 ..	114.3	33.5	793.0	12	25	30	48	118	470	1,178	1,275
MORTALITY OF LATER YEARS PER CENT. OF THAT IN 1920-22.											
Males:—											
1923 ..	96	79	110	79	79	80	87	74	104	113	114
1924 ..	92	72	108	64	69	63	75	83	104	105	122
1925 ..	87	67	104	79	52	72	62	70	93	106	120
1926 ..	92	68	112	93	67	60	70	68	105	112	124
1927 ..	94	67	116	79	74	68	58	63	107	116	133
1928 ..	97	63	126	85	60	55	55	68	107	136	140
1929 ..	101	73	125	86	60	60	90	79	106	130	150
1930 ..	99	65	128	71	57	63	59	74	109	130	154
1931 ..	94	62	122	86	52	50	55	73	102	124	150
1932 ..	99	60	131	71	50	50	65	70	104	136	170
1933 ..	99	59	132	93	62	50	52	60	105	134	172
Females:—											
1923 ..	104	95	112	69	86	92	95	115	110	112	116
1924 ..	98	75	116	69	80	67	76	80	110	118	116
1925 ..	104	80	122	69	86	67	85	90	111	131	128
1926 ..	101	74	121	56	71	73	82	80	113	127	128
1927 ..	112	76	139	69	71	67	73	91	131	135	173
1928 ..	112	79	138	69	74	69	66	102	118	147	163
1929 ..	123	81	155	69	63	65	84	106	135	157	196
1930 ..	119	72	155	69	51	56	71	99	131	165	193
1931 ..	123	77	157	69	74	65	73	98	133	167	193
1932 ..	125	75	162	81	57	60	74	95	137	174	193
1933 ..	127	78	164	75	71	63	77	95	132	180	202

71(a). Pernicious Anæmia.—The progress of mortality since 1927, when a new and effective treatment came into use for this disease is revealed in Table LIX, where annual rates at various ages are expressed in terms of the corresponding rates in the triennium preceding 1927. The actual rates in greater detail of age in each year from 1922 to 1931 were shown in the Review for 1931, Table XLVIII. In 1933 the standardized rates, which had been increasing since the sudden fall registered in 1928, were below those of 1932, an improvement being noticeable at each separate age except 25-45. For males the greatest relative decline in mortality has occurred at ages 25-45, and for females at ages under 25.

As for diabetes, the new remedies are in general only effective in prolonging life so long as treatment is continued, and unless the patient eventually dies of some acute or general disease to which precedence is given in the classification of deaths due to joint causes, or without mention being made on the certificate of the

Table LIX.—Mortality from Pernicious Anæmia per Million living in 1931, 1932 and 1933, and per cent. of the rate for 1924-26 in each year 1927 to 1933.

	MALES.					FEMALES.						
	All Ages*	0-	25-	45-	65- and up	All Ages*	0-	25-	45-	65- and up		
MORTALITY PER MILLION LIVING.												
1931 ..	34	3	13	98	311	301	43	5	27	134	328	231
1932 ..	39	5	13	111	368	339	49	5	29	149	379	235
1933 ..	35	3	13	104	317	322	46	4	30	130	367	326
MORTALITY PER CENT. OF THAT IN 1924-26.												
1927 ..	98	84	91	96	106	114	97	86	90	98	98	109
1928 ..	65	102	59	55	77	92	67	77	56	64	78	91
1929 ..	70	78	59	58	86	133	67	66	53	64	84	109
1930 ..	76	74	69	71	85	121	72	45	63	68	84	138
1931 ..	74	70	54	64	89	149	74	58	58	74	91	112
1932 ..	85	106	53	72	106	167	84	56	61	83	106	162
1933 ..	76	69	56	68	91	159	79	47	64	72	102	158

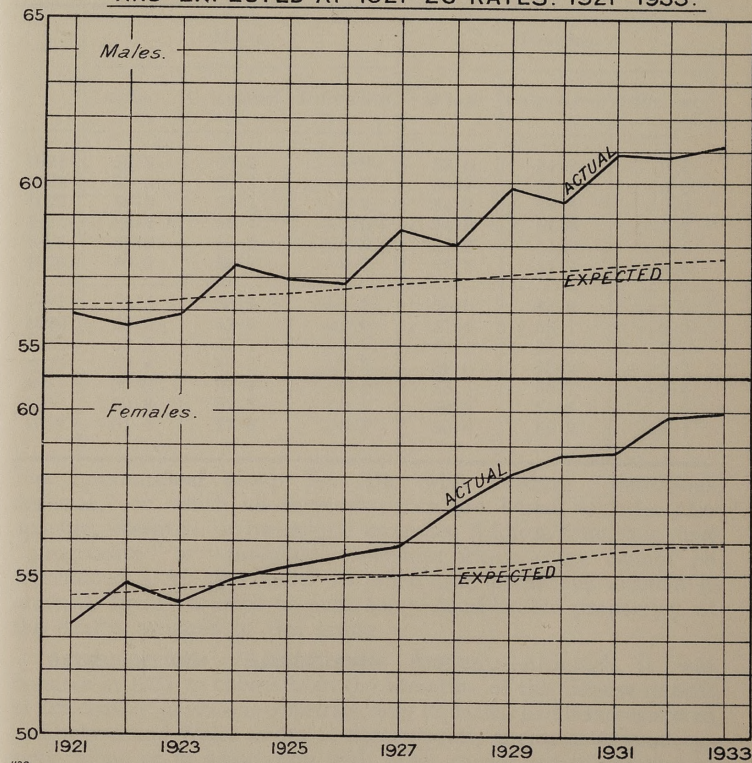
* Standardized.

pernicious anæmia, the expected effect on the mortality statistics would be a temporary reduction in annual deaths at each age, followed by a gradual return to the original total with a higher average age distribution. This assumes a constant incidence of new cases, whereas there is reason to believe that the number of recognised cases of pernicious anæmia and other blood diseases is increasing. The total deaths registered in the 8 years 1926 to 1933 have numbered 2,780, 2,655, 1,854, 1,955, 2,150, 2,226, 2,591, 2,428, which indicates a return by 1932 almost to the 1927 level, and this suggests that any absolute reduction in the fatality of pernicious anæmia brought about by the new remedies has been balanced by an increased incidence or recognition of the disease.

Comparison of the age distribution of the 2,585 deaths in 1925 with that of the 2,591 deaths in 1932 reveals a transfer of deaths up the age scale during the interval, resulting in a decrease of 318 deaths at ages under 55 and an increase of 331 at ages over 65. The average lengthening of life of which this is a sign can be estimated by applying the 1921-26 death-rates to the population at each age in each of the following years, finding from the resulting calculated deaths the expected mean age at death, and comparing these values with the actual mean ages at death from pernicious anæmia in the corresponding years.

Table LX and Diagram 5 indicate that from 1926 to 1933 the rise in actual mean age was greater than the expected rise by 3.3 years for males and by 3.5 years for females. Provided, therefore,

DIAGRAM 5. PERNICIOUS ANÆMIA: MEAN AGE AT DEATH, ACTUAL, AND EXPECTED AT 1921-26 RATES. 1921-1933.



that the age-distribution of incidence has not changed in the interval there has been a mean lengthening of life since 1926 for the whole population of pernicious anæmia cases, however treated and of all ages amounting to 3 to 3½ years.

Table LX—Pernicious Anæmia—Actual and Calculated Mean Ages at Death, 1921 to 1933.

	Males.			Females.		
	Actual.	Calculated.	Difference.	Actual.	Calculated.	Difference.
1921	55.9	56.2	-0.3	53.5	54.3	-0.8
1922	55.6	56.2	-0.6	54.7	54.4	+0.3
1923	55.9	56.3	-0.4	54.2	54.5	-0.3
1924	57.4	56.4	+1.0	54.8	54.6	+0.2
1925	57.0	56.5	+0.5	55.2	54.6	+0.6
1926	56.9	56.7	+0.2	55.5	54.9	+0.6
1927	58.5	56.8	+1.7	55.9	54.9	+1.0
1928	58.0	57.0	+1.0	57.1	55.1	+2.0
1929	59.8	57.1	+2.7	58.1	55.2	+2.9
1930	59.4	57.2	+2.2	58.6	55.9	+2.7
1931	60.9	57.4	+3.5	58.7	55.7	+3.0
1932	60.8	57.5	+3.3	59.8	55.8	+4.0
1933	61.1	57.6	+3.5	60.0	55.9	+4.1

The international group No. 71a, with heading "Pernicious Anæmia," on which all these statistics are based, includes also aplastic, essential or hæmolytic anæmias, Addison's anæmia and "progressive" or "profound" anæmias whose cause cannot be ascertained. At ages under 15 when true pernicious anæmia is unusual, these varieties account for a considerable proportion of the deaths assigned to this group.

Agranulocytosis (Agranulocytic Angina).—Although it was possible in 1931 to collect from the literature of this disease records of 225 deaths* in various countries, only 12 deaths had been registered in England and Wales as due to agranulocytic angina or agranulocytosis, alone or in association with other causes, up to the end of 1932. Of these 2 occurred in 1930, 3 in 1931 and 7 in 1932† In 1933 31 deaths, and in 1934 39, were so attributed, the classification being in some instances to other causes such as pulmonary tuberculosis or lobar pneumonia with agranulocytosis as a contributory or associated cause.

* "Journal of American Medical Association, 1931, XCVII, 1757. The number of cases was 328. Over 1,000 cases had been reported by the end of 1932 from various countries.

† Two deaths also are recorded in the literature which on certification were not attributed to the disease, one in 1928, a female aged 50, the other in 1931, a female child aged 7.

Pending a clearer definition of the disease as an established clinical entity, the deaths were classed until the end of 1934 to sub-groups 115(3) or 115(4) when it was described as angina, or with the unclassified anæmias in No. 71 b(2) when described as agranulocytosis. Since the two descriptions are now regarded as synonyms*, the angina being secondary to the blood condition, and since the latter is not characterised by "anæmia" in the usually accepted meaning of the term but by an aleukæmia affecting the granular leucocytes, from 1935 onwards a new subgroup to comprise both descriptions, with title No. 72 b(2) aleukæmia (agranulocytosis) will be introduced into Tables 6, 7, 21 and 23, and No. 72b aleukæmia (lymphadenoma) will be designated 72 b(1).

Table LXI classifies the 82 deaths attributed wholly or in part to the condition in England and Wales during 1930-34 by sex and age, with distinction of those described as (AA) agranulocytic angina or agranulocytosis with mention of a throat lesion, and those described as (A) agranulocytosis without mention of a throat lesion.

Table LXI.—Agranulocytosis: Deaths attributed to the Condition (alone or in association with Other Causes), by Sex and Age, 1930-1934.

A—Agranulocytosis without mention of a throat lesion.
AA—Agranulocytic angina, or agranulocytosis with throat lesion.

	1930.		1931.		1932.				1933.				1934.		Total.			
	M.	F.	M.	F.	M.	AA.	A.	AA.	M.	AA.	A.	AA.	M.	F.	M.	F.		
	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	A.	AA.	M.	F.		
0- ..																2		
1- ..																1		
5- ..																1		
10- ..																5		
15- ..								1								4		
20- ..								1								1		
25- ..										1						3		
30- ..										1						6		
35- ..																3		
40- ..																6		
45- ..																1		
50- ..																6		
55- ..																6		
60- ..																5		
65- ..																5		
70- ..																5		
75- ..																1		
80- ..																1		
All ages		2	1	2	1	1	3	2	1	4	7	19	3	10	3	23	21	61

Deaths of females totalled 61, and of males 21. The distribution in the successive decades of age was 3, 9, 12, 10, 11, 15, 14, 7, 1.

Of the 19 without mention of a throat lesion 8 were attributed to agranulocytosis without qualification, and the remainder to "agranulocytosis" with mention of anæmia (3), septicæmia or

* Reports on Public Health and Medical Subjects, Ministry of Health No. 76, 1935.

pyæmia (2), pneumonia and septicæmia (2), pneumonia (1), bronchitis (1), hæmoptysis (1), cerebral hæmorrhage (1). Of the 63 with mention of a throat lesion 33 were attributed to "agranulocytic angina" without qualification, 9 to agranulocytosis (or "agranulocytic anæmia") with an associated throat lesion variously described, and the remainder to agranulocytic angina with mention also of septicæmia (4), pneumonia or œdema of lungs (11), myocardial degeneration (2), uræmia (1), phlebitis (1), nephritis (1), phthisis (1).

The regional distribution was as follows: Greater London 29, remainder of South East 16, South-West 10, Lancashire 8, Yorkshire West Riding 6, Remainder of North Region 3, Birmingham 7, East 2, Wales 1.

Table LXII.—Deaths from or associated with Alcoholism; Death-rate per Million from the Combined Causes and from Cirrhosis of Liver not returned as Alcoholic, 1921-1933.

	Number of Deaths.										Death rate per million persons.	
	Alcoholism No. 75.		Returned as connected with alcoholism.								Returned as alcoholism or associated therewith.	Cirrhosis of liver not returned as alcoholic 124 (b).
			Cirrhosis of liver 124 (a)		Heart diseases 90-95.		Violent deaths 163-198.		Other causes.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
1921	127	55	100	54	41	17	61	11	125	56	17	47
1922	117	47	103	47	41	14	52	16	125	59	16	46
1923	104	47	98	54	22	12	46	16	106	57	15	42
1924	94	33	90	57	36	8	44	7	120	53	14	42
1925	95	55	87	49	25	19	34	6	90	48	13	44
1926	76	39	82	50	31	20	37	14	178	92	19	40
1927	84	24	162	101	40	22	36	17	90	58	13	44
1928	74	34	210	110	54	34	30	10	205	102	22	40
1929	85	49	175	83	69	38	41	11	206	75	21	38
1930	49	45	144	71	46	25	35	10	147	75	16	36
1931	40	41	162	99	45	35	24	2	136	45	16	34
1932	61	34	115	62	42	19	18	4	99	45	12	32
1933	43	30	115	77	52	19	24	10	79	35	12	26

75. Alcoholism.—This heading in the International List of causes of death excludes organic disease attributed to alcoholism, so, in order to obtain as complete information as possible with regard to mortality from over-indulgence in alcohol, all the deaths in certification of which any mention of alcohol appears are assembled in Table LXIII.

Although the conditions of medical certification can scarcely be expected to admit of a full and reliable return of deaths due, in part or altogether, to alcoholism, experience has shown that the figures in Table LXIII and its predecessors have in the past fluctuated in remarkable harmony with other indices of alcoholic intemperance, and are thus not without value as indicative of at least the relative extent of this form of mortality in different years, even though they

Table LXIII.—Deaths from or connected with Alcoholism—1933.

	All Ages.		Under 25		25-		35-		45-		55-		65-		75-	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
75. Deaths attributed solely to alcoholism	43	30			6	1	7	5	7	10	12	8	10	6	1	
Deaths attributed to other causes in conjunction with alcoholism—																
11. Influenza	8	1					2		4		2			1		
15. Erysipelas	2								2							
23. Tuberculosis of the respiratory system	1	1							1	1						
34. Syphilis	1								2	1			1			
45-53. Cancer	5	1							2	1	2					
54 (a) Fibroid of uterus									1					1		
57-2. Osteo-arthritis														1		
59. Diabetes	1												1			
60. Scorbutus		1							1							
70 (a) Purpura hæmorrhagica	1								1	1				1		
71 (a) Aplastic æmia		1							1							
76. Paraldehyde poisoning	1										1					
80. Tabes dorsalis	1										1					
82. Cerebral hæmorrhage, apoplexy, etc.	5	1					2		2				1	1		
84 (b) Other forms of insanity	2								2							
85. Epilepsy	2				1		1		1							
87 (b) Neuritis, neuralgia	5	5					1	2	3	2	1	1				
92. Valvular disease of heart	8	3							1	2	2		3	1		2
93 (b: 1) Fatty heart	11	3			1		3	1	3	2	4					
93 (b: 2) Cardiovascular degeneration	3	1										1	3			
93 (b: 3) Other or unspecified myocardial disease	18	8			2		1	2	3	4	5		4	1	3	1
93 (c) Myocarditis not distinguished as acute or chronic	8	1					1	1	2		4		1			
94. Diseases of the coronary arteries	3	1									1		2	1		
95 (b: 2) Heart disease (undefined)	1	2					1		1	1	1					
97. Arterio-sclerosis	5	2								2			3	1		1
106. Bronchitis	2	2										1	1	1		
107. Broncho-pneumonia	4	4							2	1	1	1		2	1	
108. Lobar pneumonia	9	1			1		4		1		3	1				
110 (2) Pleurisy	1				1											
112. Asthma	1	1					1						1			
115 (3) Diseases of the tonsils	2						2									
117. Ulcer of the stomach or duodenum	5						1		2		2					
118 (1) Inflammation of the stomach	5	5					1		4		2			3		
119-120. Diarrhoea and enteritis	1	1								1	1					
122 (a: 2) Femoral hernia		1						1								
122 (b) Intestinal obstruction		1														
124 (a) Cirrhosis of the liver	115	77			2		7	7	31	20	37	29	31	15	7	6
130-131. Nephritis	7	3					2		3	1	1	1		1		
133 (a) Pyonephrosis		1												1		
133 (b) Cystic kidney		1												1		
152 (1) Cellulitis of back	1								1							
163-171. Suicide	3	3					2		2	1	1					
183. Accidental drowning	1		1													
186 (pt.) Injury by fall	11	5					1		1	2	4	2	4	1	1	
186 (pt.) Injury by crushing (vehicles, railway, etc.)	3				1				2							
Other violence	6	2					4				1	1	1	1		
TOTAL	313	171	1		15	1	42	23	83	49	89	49	68	39	15	10

cannot be taken as measuring it absolutely. During the half century prior to 1926 the mortality rates derived from such tabulations fluctuated in close correspondence with the records of consumption of alcohol (see Diagram II in Review for 1929).

After 1926 the change in the form of the medical certificate produced a temporary disturbance, consisting, as Table LXII indicates, in a sudden increase in deaths attributed to various causes with mention of alcoholism. Violent deaths with associated

alcoholism were unaffected, numbering 53, 51, 40, 52, 45, in the five years from 1926 to 1930, and then falling. Deaths attributed to heart diseases with mention of alcoholism increased from 51 in 1926 to 107 in 1929, but in more recent years have fluctuated about 70. The death-rate per million due to cirrhosis of the liver with mention of alcohol increased from 3 in 1926 to 8 in 1928, and has since declined to 4 in 1932 and 5 in 1933 (Table 7), whereas the rate for cirrhosis without mention of alcohol has declined continually from 44 in 1926 to 26 in 1933. Deaths attributed to causes other than violence, heart disease or cirrhosis of the liver, with mention of alcoholism, increased from 148 in 1926 to 281 in 1929, but have rapidly declined since to 114 in 1933.

The number of deaths attributed solely to alcoholism without mention of other causes, 73, is the lowest recorded.

82. *Cerebral Hæmorrhage, Apoplexy, etc.*—The revised form of the International List (1929) in use since 1931 combines in one group, No. 82, the causes of death which constituted No. 74, cerebral hæmorrhage, apoplexy, etc., No. 75, paralysis of unstated origin (mostly hemiplegia), and No. 83, cerebral softening, in the former classification. The last two groups are of diminishing importance, their contributions forming 4·5 and 1·0 per cent. respectively of the total in 1933, compared with 7·9 and 3·1 per cent. respectively in 1921.

The deaths assigned to this heading in 1933 numbered 25,720 (males 11,215, females 14,505). The standardized rates, 404 per million for males and 399 for females, were the lowest recorded. The true frequency of these causes of death since 1926 is somewhat masked by an increasing tendency, encouraged by the introduction in 1927 of the new form of medical certificate, to state the disease causing the hæmorrhage, which has resulted in a transfer of deaths from cerebral hæmorrhage to arterio-sclerosis, myocardial disease and chronic nephritis, three of the chief diseases with which cerebral hæmorrhage is most frequently associated in the certification of causes of death. It is difficult to estimate the extent of the transfer to myocardial disease and chronic nephritis, but any vitiation of comparability with past records in respect of arterio-sclerosis can to a great extent be overcome by adding the deaths from cerebral vascular lesions associated with arterio-sclerosis, No. 97 (1) and (2), separately tabulated since 1921 (as 91b: 1 in the 1921-30 classification) to those from cerebral hæmorrhage without statement of cause.

The crude death-rate from the combined headings (Nos. 82 and 97 (1) and (2)) was 903 for males and 1,005 for females. When standardized, however, to eliminate the effect of the increasing age of the population, the male rate of 628 and the female rate of 576 per million are remarkably close to the rates of 1921, namely, 640 for males and 592 for females.

90-95. **Heart Diseases.**—The number of deaths allocated to this cause, 108,087, 51,412 of males and 56,675 of females, was as usual larger than for any other item in the list of causes.

These numbers are equal to crude death-rates per million of 2,656 for males and 2,700 for females, which are the highest recorded for each sex during the present century. When standardized, the revised rates are considerably reduced to 1,896 for males and 1,616 for females, but still remain in this form the highest in any year for males and in any year except 1929 for females (Table 8).

As pointed out in previous Reviews the recent increase of crude mortality (Table 7) from heart diseases is due, among other causes, to the increasing age of the population and to rapid increase of the record of myocardial degeneration in certification of the deaths of old people. Table LXIV shows how the rates quoted above for 1933 have been affected by these influences, and what, but for them, would have been the course of recent mortality from diseases of the heart. This has been done by ascertaining and deducting

Table LXIV.—Deaths in Standard Million from Heart Diseases at all ages, and from senile myocarditis at ages over 65 in 1921 and 1931-33 ; also the mortality in each year 1922-33 per cent. of that in 1921.

	Males.			Females.		
	All Heart Diseases.	" Senile Myo-carditis " (see text).	Col. 1 less col. 2.	All Heart Diseases.	" Senile Myo-carditis " (see text).	Col. 4 less col. 5.
	(1)	(2)	(3)	(4)	(5)	(6)
1921 ..	1,203	154	1,049	1,107	145	962
1931 ..	1,845	746	1,099	1,592	646	946
1932 ..	1,848	779	1,069	1,560	661	899
1933 ..	1,896	818	1,078	1,616	705	911
Rates for subsequent years per cent. of those for 1921.						
1922 ..	108	129	105	110	129	107
1923 ..	101	136	95	102	134	97
1924 ..	105	165	97	107	158	99
1925 ..	110	203	96	110	192	98
1926 ..	108	219	92	107	210	92
1927 ..	117	259	97	118	248	98
1928 ..	123	296	97	122	285	97
1929 ..	153	450	109	150	427	108
1930 ..	142	421	101	134	388	96
1931 ..	153	484	105	144	446	98
1932 ..	154	506	102	141	456	93
1933 ..	158	531	103	146	486	95

from the standardized death-rate from all heart diseases (Table 8) that portion of it for which chronic myocardial disease (other than fatty heart) at ages over 65 was responsible in each year 1921-33, that is to say, the deaths at this age in the standard million derived from the three groups 93*b* (2), 93 (i) (3) and 93 (c), corresponding to No. 90 (7) prior to 1931. The rates for the years 1922 to 1930 were shown in detail in Table L of the Review for 1931.

The crude death-rate from heart disease has increased since 1921 by 89 per cent., but the standardized rate has increased by 58 per cent. for males and 46 per cent. for females. When further allowance is made for the disturbing influences mentioned above, the increase is seen to have been only 3 per cent. for males and there has been a decrease of 5 per cent. for females.

Table LXIV also shows how rapid has been the increase for each sex of mortality ascribed to senile myocarditis, the rates for 1933 being about five times those of 1921. Its contribution to total heart disease mortality has increased from 13 per cent. in 1921 to 46 per cent. in 1933. Another change in the medical terminology of heart disease is reflected in the rise in the standardized death-rate attributed to "disordered action of the heart," now separately classified in the International List as group No. 95 (a), from 6 per million for each sex in 1919 to 37 for males and 46 for females in 1933. This increase is doubtless mainly at the expense of "heart disease (undefined)" for which the standardized rates have fallen since 1922 from 271 to 78 for males and from 250 to 73 for females.

The progressive rise since 1920, commented on in previous Reviews, in the standardized mortality assigned to diseases of the coronary arteries and angina pectoris, No. 94, continued in 1933. For males this rate has risen from 32 in 1920 to 224, and for females from 13 to 80. Part of this has been due to the transfer, since mid-1927, of deaths due to atheroma and sclerosis of the coronary arteries from the arterio-sclerosis group, as pointed out in the Review for 1928 (p. 100), but the increase since 1928, more than doubling the rate for each sex in 5 years, represents a real change in the frequency with which death is attributed to coronary disease. Comparison of the death rates per million at various ages, in 1928 and 1933 is made below.

		0-	35-	45-	55-	65-	75 & up
Males	1928 ..	2	39	168	492	1,022	1,264
	1933 ..	2	71	391	1,027	2,249	3,171
Females	1928 ..	0	7	34	143	414	624
	1933 ..	1	18	80	313	898	1,618

The increase in the short space of 5 years amounts to 130 per cent. at ages 45-55, 110 to 120 per cent. between 55 and 75, and over 150 per cent. at ages over 75.

104-114. **Diseases of the Respiratory System.**—The total number of deaths allocated to these diseases was 56,240, or 1,432 more than

in 1932. The standardized death-rate for males, 1,442 per million, is the lowest recorded, save in 1930 and 1932, and the rate for females, 1,043, is lower than in any year except 1930 (Table 8). The March quarter was responsible for 47 per cent. of the deaths, compared with 44 in 1932 and 47 in 1931 (*see* Review for 1931, Table LI). The remarkably low respiratory mortality in February and March, having regard to the very high influenza death-rate in January and February, is revealed in Table LXXXIX, and also below.

The seasonal deaths assigned to respiratory diseases, without mention of influenza, and from influenza with and without mention of respiratory complications, may usefully be compared with the corresponding figures for mid-1926 to mid-1927, a year which suffered almost the same influenza mortality as 1932-33, and for mid-1929 to mid-1930, a year of low influenza prevalence.

	Influenza						Diseases of respiratory system.		
	without respiratory complications.			with respiratory complications.					
	1926-7	1929-30	1932-3	1926-7	1929-30	1932-3			
July ..	114	98	78	120	126	67	2,719	3,042	2,264
August ..	76	87	58	82	81	56	2,263	2,436	2,040
September ..	104	81	75	77	77	67	2,424	2,443	2,098
October ..	212	141	150	245	212	232	4,333	3,590	3,353
November ..	297	159	177	381	351	212	6,071	4,815	3,630
December ..	252	196	385	378	318	854	7,643	4,920	5,769
January ..	1,130	233	2,560	2,868	389	8,942	12,555	5,881	12,507
February ..	2,558	232	1,701	6,871	532	5,434	16,160	6,601	8,619
March ..	1,374	257	429	3,143	565	783	9,482	7,255	5,332
April ..	383	204	236	565	348	347	5,577	5,073	4,076
May ..	199	142	136	285	228	162	4,674	4,072	3,085
June ..	153	89	74	161	111	99	3,846	2,908	2,583

The 1927 epidemic reached its maximum in February, whereas that of 1933 produced most deaths in January. The March quarter deaths were as follows:—

	1927.	1930.	1933.
Influenza without respiratory complications	5,062	722	4,690
Influenza with respiratory complications	12,882	1,486	15,159
Respiratory disease ..	38,197	19,737	26,458

A more complete mention on the death certificate of influenza as the cause of respiratory deaths in 1933 than in 1927 is suggested by these figures, but the total excess of deaths from respiratory disease, with or without associated influenza, over the number in 1930 was 20,394 in 1933, compared with 29,856 in 1927. It is also noticeable that although deaths from respiratory disease, without associated influenza, during the epidemic period from December 1932 to February 1933 exceeded those of the corresponding

months of the healthy winter of 1929-30, very low levels of mortality from this cause were reached in the months just preceding and following this period.

The decline in pneumonia mortality rates at various ages in recent years is indicated in Table LXV. The three years 1922, 1927 and 1933, which are separated for comparison as influenza years, were characterised by almost the same degree of influenza mortality, the total deaths registered from that cause being 21,498 22,263 and 22,890 respectively. At each age except 5-15 and over 75 these years show a progressive decline in pneumonia rates, and this is also evident at every age when the normal years 1925 and 1930 are compared.

Table LXV.—Pneumonia (All forms): Death rates per Million living at various ages in several years from 1911-20 to 1933.

	1911-20.	Normal years		Influenza years			1933 per cent. of 1911-20.
		1925.	1930.	1922.	1927.	1933.	
Males—							
0- ..	5,497	4,808	3,318	6,180	5,265	3,696	67
5- ..	273	204	168	186	226	169	62
15- ..	374	213	172	240	212	170	45
25- ..	605	349	288	428	321	255	42
35- ..	838	727	612	749	677	553	66
45- ..	1,262	1,030	975	1,031	984	928	74
55- ..	1,985	1,575	1,335	1,699	1,464	1,320	66
65- ..	3,095	2,812	2,234	3,065	2,818	2,017	65
75 and up	4,500	5,175	3,978	4,878	5,102	4,510	100
Females—							
0- ..	4,564	3,921	2,571	5,029	4,143	2,939	64
5- ..	270	191	142	181	189	146	54
15- ..	206	115	92	122	114	101	49
25- ..	320	204	134	228	184	151	47
35- ..	402	283	228	330	297	280	70
45- ..	576	440	313	475	422	386	67
55- ..	1,061	883	666	995	862	710	67
65- ..	2,148	2,109	1,521	2,171	2,048	1,563	73
75 and up	3,806	4,503	3,508	4,210	4,355	4,168	110

Comparison of 1933 with 1930 shows that, despite the epidemic 1933 registered lower pneumonia rates for males between the ages 15 and 75. Since 1911-20 the decline has exceeded 50 per cent. at ages 15-35, and has exceeded 25 per cent. at every age under 75 for each sex.

140-150. **The Puerperal State.**—*Deaths and their Classification.* The number of deaths assigned to diseases of pregnancy, childbirth and the puerperal state was 2,618 (Tables 6, 21 and LXVI), of which 378 or 14.4 per cent. were assigned to abortion, 252 or 9.6 per cent.

to ectopic gestation and other accidents and toxæmias of pregnancy, and the remainder to diseases and accidents of childbirth at full term.

In addition 85 deaths from criminal abortion were assigned to various forms of violence, *e.g.*, suicide, murder, etc., in accordance with the verdicts recorded by the coroners' juries (Tables 25 and LXVI), and 828 deaths of pregnant or parturient women who suffered from various non-puerperal diseases (Table LXVII) were classified to those diseases. The assignment of deaths, attributed to a non-puerperal cause, in association with pregnancy or the puerperal state, to the puerperal group on the one hand or to the non-puerperal cause on the other is carried out in accordance with rules of precedence outlined in the Manual of the International List of Causes of Death.

It should be remembered that the 828 deaths defined by this process as "not classed to pregnancy but returned as associated therewith," or in shorter terminology as "classed to non-puerperal causes," resulted in large part from risks to which the general population of women was exposed and a large proportion of them would have occurred if these women had not been pregnant. Every pregnant woman is exposed to about the same hazards of dying from non-puerperal causes as if she had not been pregnant, and if she does so die the fact of pregnancy or recent parturition is usually mentioned on the death certificate on the grounds that notwithstanding that normal childbearing is a physiological process it is difficult to assert categorically that in the presence of some serious disease it did not, by diminishing the reserves of strength or by some other means, render recovery more difficult. The introduction of the new form of certificate in 1927 undoubtedly resulted in a more complete recording of associated childbearing, since this might in many instances be regarded as "contributing to death but not related to the immediate cause," though neither "primary" nor "secondary" in the terminology of the old form of certificate.

It was suggested in the Review for 1927 (p. 79) that part of the jump in associated deaths noticed in that year was due to this change, and it is perhaps best demonstrated by contrasting the subsequent trend of associated deaths (excluding those assigned to influenza which depend on the presence or absence of an epidemic) with the trend of non-septic puerperal deaths, each in terms of the mean annual deaths in 1924-26 taken as 100.

	1924-6 (mean)	1927	1928	1929	1930	1931	1932	1933
Puerperal non-septic causes	100	93	97	91	90	87	89	87
Non-puerperal causes (except influenza) with associated child-bearing	100	110	110	120	112	122	98	104

No change in the application of the rules of precedence of puerperal over non-puerperal causes was made with the introduction of the new certificate, and the different trends cannot be explained by transfer from the one group to the other. The fall in the number of deaths assigned to puerperal causes other than sepsis is accounted for by the decline in births, but the deaths assigned to other causes having mention of pregnancy or childbirth, instead of falling in sympathy, increased for several years and these deaths during 1931-33 were 8 per cent. in excess of 1924-26 compared with a 12 per cent. deficiency of puerperal non-septic deaths. On this basis it may be estimated that more complete mention of associated childbearing on the new form of medical certificate of death accounts for about one-fifth of the deaths now assigned to causes other than puerperal (Table LXVII) and therefore of the rates from non-puerperal causes (Tables LXXII, LXXIII) and this should be borne in mind when comparing recent rates with those prior to 1927.

It is difficult to estimate what proportion of deaths of pregnant or recently confined women escape inclusion in one or other of these groups. A number of abortion deaths are doubtless attributed to non-puerperal causes without mention of the abortion, but apart from these it seems probable that the great bulk of deaths of married women from any cause between the 4th month of pregnancy and one month after confinement find their way into these groups, and that those who escape are compensated for by the considerable number included with mention of pregnancy of less than 4 months duration or occurring more than one month after confinement. On that assumption the annual number of deaths due to non-puerperal risks to be expected amongst the married women who were pregnant during the year can be approximately estimated by regarding each as exposed to the non-puerperal death rate of married women for the appropriate age during an average period of 6 months. The estimated legitimate live and still births in 1933 to married women at ages 15-25 numbered 124,420, at ages 25-35 331,200 and at 35-45 123,080, and applying to these completed pregnancies the non-puerperal death rates during 1930-32 amongst married women derived from Table XXXIV, the expected deaths number 1,560 in the full year or 780 in half a year (or if they were exposed to the non-puerperal death rates of single women, the expected number would be 989 for the half year. Actually 771 deaths of married women were classed to non-puerperal causes with mention of pregnancy or childbearing.

This supports the view that the number of deaths which are assigned by the methods applied in England and Wales to "non-puerperal causes but associated with pregnancy or childbearing" approximately represents the number which ought properly to be so assigned, and that this group of deaths ought not to be laid at the door of childbearing.

It is true that Table LXVII contains a considerable number of deaths which would more properly be classed as puerperal—

some of these are specified below in the comment on that table—but these tend to be balanced by the inclusion in Table LXVI of deaths following puerperal sepsis of slight degree associated with serious non-puerperal disease, such as lobar pneumonia or pre-existent kidney disease, which, owing to the high precedence always accorded to sepsis over such diseases, are classed to the puerperal cause. In order to ascertain what modification of the distribution of deaths between the puerperal and associated groups would result if the allocation was freed from all such rules of selection of joint causes and based in every instance upon the order of causation stated by the certifying practitioner, the first quarter's deaths for 1934 were classified by both methods with the following result.

	By method laid down in Manual.	By preference as stated on Certificates.
"Puerperal" group	767	752
Non-puerperal or "associated" group	255	242
Indeterminate	—	28
Percentage of determinate deaths assigned to "puerperal" group	75.0	75.7

The indeterminate group consists of certificates completed in such a way that no opinion could be formed as to which was thought to be the most important cause.

It is evident that the total distributions between the puerperal and non-puerperal groups resulting from the two methods are in agreement within a small margin of probable error, and this lends further support to the conclusion arrived at above, by an independent process of reasoning.

The addition of the non-puerperal deaths *in toto* to the deaths assigned to puerperal causes in order to produce a total rate of "mortality from or associated with pregnancy or childbirth," as in Table LXXII, only implies that in this rate are included the deaths from all causes whatsoever (other than criminal abortion) in the course of whose registration it is ascertained that the woman was pregnant or had been confined within a significantly short period. The procedure with regard to the classification of deaths from jointly stated causes at present differs so widely in different countries that the statement of a total rate based upon such a simple definition provides the only possible means of international comparison, but even when so used it is necessary to bear in mind the differing completeness of certification of associated pregnancy in countries employing different forms of certificate.* Whilst these considerations seem to justify the continued statement of the combined rate for certain purposes, this total rate must be regarded as an over-

* Comparability of Maternal Mortality Rates in the United States and certain Foreign Countries. Washington, 1935.

statement of the immediate mortality risk which childbearing involves.

Assessment of puerperal mortality in a form which will be comparable with that of past and future years is also complicated by (1) changes in classification mainly due to the international revisions, (2) the sudden interest in abortion deaths as distinct from other puerperal deaths, (3) the absence of statistics of multiple births and abortions, and (4) the establishment of still-birth registration in 1927. The need for maintaining continuity whilst at the same time making full use of the additional data becoming available at various times in recent years makes a multiplication of rates unavoidable.

Changes of Grouping in 1911, 1921 and 1931 which have affected comparability of the rates may be summarised as follows. In 1911 deaths from puerperal mastitis, previously included with puerperal septicaemia or fever, were transferred to a new group "puerperal diseases of the breast," and have since remained in that group, this transfer from the sepsis group to "other puerperal causes" being responsible for the slight differences in the two series of "puerperal sepsis" rates in Table LXXII. Deaths from puerperal nephritis and albuminuria, previously assigned to diseases of the kidneys, were brought within the puerperal causes as new groups, this addition in conjunction with the transfer of mastitis deaths accounting for the differences in the two series of rates from other puerperal causes in Table LXXII. From that year also "haemorrhage of pregnancy" was separated from puerperal haemorrhage, whilst ectopic gestation, "uncontrollable vomiting" and puerperal embolism were separated from other accidents of pregnancy and of childbirth in the annual reports, although the International List did not distinguish them until later revisions.

From 1931 post-abortive sepsis was separated from the general group of puerperal sepsis when abortion was specified, and antepartum haemorrhage was transferred to the group of non-septic abortion. The latter heading was subdivided for convenience in Tables 6 and 7 into two sub-groups, (1) deaths from "haemorrhage following abortion" which prior to 1931 had been distinguished only in the detailed table of the Text volume, but elsewhere merged in the old groups of "abortion" and "other accidents of pregnancy," and (2) deaths from "abortion without record of haemorrhage" which comprised those deaths without mention of haemorrhage included in the old "abortion" group. In the same year chorea and vomiting of pregnancy were transferred to the new group of "other toxæmias of pregnancy" along with undefined "toxæmia" deaths which had previously been included under the heading puerperal albuminuria and convulsions. Deaths attributed to "puerperal tetanus" were brought within the puerperal causes, the number so described being much too small to appreciably affect the rates. Puerperal thrombosis was also transferred from the

Table LXVI—continued.

Table with columns for Cause of Death, All Ages, Civil Condition (Single, Married, Widowed), and Ages (10-15, 20, 25, 30, 35, 40, 45 and upwards). Rows include 145. Puerperal sepsis not returned as post-abortive, 146. Puerperal albuminuria and convulsions, 147. Other toxæmias of pregnancy, and 148. Puerperal phlegmasia alba dolens.

* Including 1 divorced woman.
† Including 2 divorced women.

Table LXVI—continued.

Table with columns for Cause of Death, All Ages, Civil Condition (Single, Married, Widowed), and Ages (10-15, 20, 25, 30, 35, 40, 45 and upwards). Rows include 149. Other accidents of childbirth and 150. Other or unspecified conditions of the puerperal state.

* Including 1 divorced woman.
† In addition Cæsarean section was stated to have been performed in the case of 109 deaths included in other headings in this table—concealed accidental hæmorrhage of pregnancy 1, hydramnios 1, placenta prævia 10, accidental hæmorrhage 3, puerperal albuminuria and convulsions 9, toxæmia of pregnancy 6, contracted pelvis 51, malpresentation 4, hydrocephalic fœtus 1, difficult labour 17, ruptured uterus 3, rigidity of cervix 2, twinbirth 1.
‡ Including 3 divorced women.

Table LXVIII.—Deaths attributed to, or associated with, Abortion, 1926-33.

Old List No.	New List No.		1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
Part of 146	140	Post-abortive sepsis	222	215	224	238	300	229	262	257
	141	Abortion not returned as septic:—								
Part of 143c		(1) Haemorrhage following abortion.	72	72	47	51	59	97	105	108
143a		(2) Without record of haemorrhage.	86	82	77	67	65	21	12	13
199, 202	VI (Table 25).	Criminal abortion (inquest cases).	51	47	57	67	67	79	69	85
		Total attributed to abortion.	431	416	405	423	491	426	448	463
		Associated with abortion but not classed to it.	?	?	83	182*	77	77	90	97
		Total attributed to, and associated with, abortion.	?	?	488	605	568	503	538	560

* The excessive number of deaths associated with abortion but not classed to it in 1929 was partly due to the influenza epidemic of that year and partly to the allocation to abortion rather than to childbirth for that year only of 63 deaths said to be associated with premature delivery without definition as to length of gestation.

It should be noted that abortions resulting from other complications of pregnancy are still classed to Nos. 143, 146, 147 and do not appear under any of the "abortion" headings unless there is some other associated condition causing the death to appear in Table LXVII. Such abortions, which are secondary to a toxæmia or some other morbid condition of pregnancy, even if they could all be ascertained by special inquiry, are in a class by themselves and there would seem to be little justification for adding them to Table LXVIII.

It has been frequently alleged that the increase in mortality from puerperal sepsis may be due to increase in the proportion of deaths from septic abortion. The percentage ratios of deaths classified to puerperal sepsis and stated to have occurred after abortion to the total deaths from puerperal sepsis for the years 1926-33 are as follows:—

1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
20.0	20.9	18.9	20.5	24.1	21.8	26.4	24.2

Many medical certificates, however, contain no mention of whether the sepsis followed abortion or delivery at term, and during 1932 inquiry was made regarding a sample of 100 deaths attributed to "puerperal sepsis" and having no statement as to the duration of pregnancy. The result was that 4 were assigned to post-abortive sepsis (No. 140) and 96 to puerperal sepsis not returned as abortion (No. 145), 90 of the latter being definitely stated as "full-term," 4 as premature but over 28 weeks' gestation, and 2 presumably full term. The residual number of deaths from puerperal sepsis with no statement as to duration of pregnancy was 412, and assuming the sample of 100 to have been representative, 4 per cent. of these, or 16 deaths, probably also belonged to the septic abortion group.

When this correction was made, the post-abortive sepsis deaths were raised to 278 and the total attributed to abortion to 464, or including those associated with abortion, 554. If it is further desired to make the 1929, 1930, 1931 and 1933 totals comparable with the 1932 figures corrected in this way, the sepsis deaths having no statement numbered 637, 670, 537 and 515 in those years and 4 per cent. of these numbers should be transferred to the abortion totals in Table LXVIII. The 63 deaths mentioned in the note below that table should also be omitted from the "associated with abortion" total in 1929. The effect of these corrections upon the mortality rates from abortion in each year from 1929 is explained in the note below Table LXXIII.

Table LXVI gives particulars of all deaths assigned in 1933 to the puerperal state with *detail of cause* within each international heading 140 to 150, and of criminal abortion deaths, according to the civil condition and age of the deceased. Subdivision of each main heading into 3 lines now makes it possible to distinguish the ages at death from the specified cause for single, married or widowed women separately. The relative distribution of these deaths according to cause is seen from Table LXIX to have undergone considerable changes since 1921. Puerperal sepsis comprised 35.4 per cent. of the total of puerperal deaths plus criminal abortion

Table LXIX.—Deaths from certain puerperal causes per cent. of all puerperal causes plus criminal abortion, 1921-25, 1926-30 and 1933.

	1933.					1921-25.	1926-30.	1933.	
	Single.		Married.						Women of all ages.
	15-25.	25-45.	15-25.	25-35.	35-45.				
Puerperal sepsis (140, 145) ..	41.4	39.5	40.6	41.7	35.5	35.4	39.8	39.3	
Abortion (all forms) ..	35.4	32.6	9.3	14.3	19.9	7	15.0	17.1	
Puerperal hæmorrhage (not abortion).	1.0	5.8	6.0	10.3	13.0	13.5	11.5	10.0	
Puerperal albuminuria and toxæmias.	24.2	18.6	27.6	17.7	16.6	19.4	20.0	18.9	
Puerperal phlegmasia alba dolens.	3.0	3.5	5.0	6.2	8.7	9.1	6.7	6.5	
Other accidents of childbirth.	9.1	8.1	12.3	12.1	11.1	7.8	9.4	11.5	

during 1921-25, but by 1933 the percentage had increased to 39.3. Age and civil condition have little influence upon this ratio. Puerperal phlegmasia alba dolens has declined relatively to the total, though not in recent years, and the proportion of puerperal hæmorrhage deaths has also declined. Increasing precision of certification has probably caused some transfer from these to other groups. The albuminuria and toxæmia deaths continue to form about one-fifth of the total, but the proportion is considerably higher for young women under 25. Other accidents of childbirth formed 7.8 per cent. in 1921-25, but this had risen to 11.5 per cent. by 1933.

Abortion deaths (including those classed to the headings of criminal abortion) form 17.1 per cent. of the total in 1933 compared with 15.0 in the quinquennium 1926-30. Amongst single women, whether under or over 25 years of age, abortion deaths form about one-third of the total, but amongst the married the percentage increases with advancing age from 9.3 at 15-25 to 19.9 at 35-45.

Table LXXVII gives, in detail of the International List, the *non-puerperal causes* to which deaths stated to have been complicated by the existence of the puerperal state were assigned in 1933. The largest numbers in the table are—influenza 129, mitral valve disease 83, tuberculosis of the respiratory system 73, lobar pneumonia 69, chronic nephritis 55, intestinal obstruction 40, and acute yellow atrophy of the liver 34. The number classed to influenza was greater than in the preceding 3 years (23, 94, 55) but less than in the epidemic year of 1929 (155). Phthisis, lobar pneumonia and mitral disease are given precedence over puerperal conditions as a rule on the ground of their infective nature or prior origin in point of time. When lobar pneumonia originates after delivery, some puerperal cause is not infrequently stated on the certificate of death as the "morbid condition giving rise to" the pneumonia (in 10 deaths out of the 69), but the assignment is made in accordance with the rules of precedence in the Manual, that is to the puerperal cause in cases of sepsis or phlegmasia alba dolens but to lobar pneumonia otherwise.

Similar considerations apply to *intestinal obstruction*, and in this instance, owing to increasing attribution of deaths to paralytic ileus following operative procedures involving abdominal section, this group has become somewhat overweighted. Ileus following operative procedures has always been accorded the same preference, in the classification of joint causes, as other forms of ileus, and in 1933 21 deaths attributed to ileus, mostly paralytic, following Cæsarean section are included under the heading 122 (b) Intestinal obstruction in Table LXVII (5 in 1921). Whilst it is desirable that where death from paralytic ileus follows such operations as Cæsarean section the classification should be made to the cause requiring the operation, such a change of classification would interfere with the comparability of the statistics with those of preceding years, and it is considered preferable to continue the assignment of such deaths to this group during the present decade but to indicate the number so included in a note below Table LXVII.

Although no national statistics are available of the frequency with which *Cæsarean section* is resorted to, this frequency has certainly increased during the past decade, and this is reflected in the increasing number of deaths with mention of this operation, partly assigned to puerperal and partly to non-puerperal causes (Table LXX). In 1921-23 and succeeding triennia to 1930-32,

Table LXX—Deaths with Mention of Cæsarean Section, 1921-1933.

	Assigned to Puerperal Causes.					Assigned to non-puerperal causes.			Total with mention of Cæsarean Section.	
	Placenta prævia.	Contracted pelvis.	Albuminuria, etc.	Other specified.	Reason not stated.	Total.	Intestinal Obstruction.	Other Causes.		Total.
1921 ..	4	19	3	13	50	89	5	18	23	112
1922 ..	5	9	9	25	20	68	7	13	20	88
1923 ..	1	8	8	35	33	85	5	18	23	108
1924 ..	7	39	6	32	4	88	11	13	24	112
1925 ..	9	31	8	32	10	90	11	18	29	119
1926 ..	6	40	16	30	5	97	10	12	22	119
1927 ..	5	24	10	56	2	97	8	23	31	128
1928 ..	9	40	16	46	2	113	11	24	35	148
1929 ..	15	55	9	17	8	104	11	35	46	150
1930 ..	11	43	8	25	5	92	23	27	50	142
1931 ..	14	54	16	41	10	135	16	32	48	183
1932 ..	13	46	10	38	9	116	22	30	52	168
1933 ..	10	51	9	39	16	125	21	24	45	170

these deaths averaged 103, 117, 142 and 164 per annum, and in 1933 numbered 170. Prior to 1924 the reason for resorting to Cæsarean section was often unstated, but from that year onwards has been ascertained for all except a small residue of deaths. In 1931-33, 29 per cent. of the total deaths were assigned to contracted pelvis, 7 per cent. each to placenta prævia and eclampsia, 23 per cent. to other specified puerperal causes, 7 per cent. to some unstated puerperal cause, 11 per cent. to intestinal obstruction and 16 per cent. to other non-puerperal causes.

Deaths attributed to *chronic nephritis* in conjunction with puerperal sepsis or phlegmasia alba dolens are assigned as a rule to the puerperal cause, but if associated with other puerperal conditions the assignment is usually to chronic nephritis on the ground of its presumed priority in point of time. An examination of the certificates of the 55 deaths included in Table LXVII reveals the fact that in the case of 10 a preference for the puerperal condition as the underlying cause seemed to be expressed by the certifying practitioner and in the case of 43 a preference for chronic nephritis. A test carried out on the first quarter's deaths of 1934 shows that this over-assignment to chronic nephritis of the non-septic deaths is almost offset by an over-assignment to the puerperal cause of deaths in which a slight degree of sepsis played a part.

Acute yellow atrophy of the liver occupies a somewhat anomalous position in Table LXVII, its exclusion from the category of "other toxæmias of pregnancy" being in accordance with a decision of the International Conference of 1929. It may be noted as an indication of the trend of opinion as to the significance of this disease that in the case of 22 deaths out of 34 assigned to this cause with associated childbearing in 1933, preference for the puerperal condition as underlying cause was expressed by the certifier.

Table 5 for each puerperal cause, but from 1931 rates based upon the total births registered in each year have been substituted (Table 7). Rates of mortality from combined puerperal causes per 1,000 live births have been given in the text of the Reports since 1902, and in Table LXXII such rates are given from 1891-95 according to the classification in use prior to 1911, and from 1911 onwards according to both the old and revised systems.

Reliable statistics of stillbirths have been available since 1928, and as the total births, *i.e.*, live and still births, provide a closer approximation to the number of women exposed to the risk of dying from puerperal conditions than do live births alone, maternal mortality rates have been calculated since that year on both bases, and will continue to be so calculated for a sufficient period to enable statistical continuity to be assured. It will be observed from Table LXXIII that while the rates on the wider basis are naturally lower than those based on live births the relative changes from year to year remain practically unchanged.

Since the mortality assigned to causes No. 144-150 (that is to say, causes other than abortion, ectopic gestation or other accidents of pregnancy) occurs almost entirely in women whose pregnancy has lasted 28 weeks or over, the women at risk of death from these causes would properly be measured by the number of confinements resulting during the year in one or more live or stillbirths *plus* the number of women who died from these causes undelivered *plus* the number of women pregnant over 28 weeks who died from other causes without childbirth supervening. The number in the second category must be small compared with the total deaths from causes No. 144-150, and the number in the last category having no mention of pregnancy on the certificate, which would consequently escape inclusion in Table LXVII, may be presumed to be small compared with the number of deaths after the 28th week of pregnancy which are recorded in that table. It follows that the number at risk to be added to the live and still birth confinements will be less than the total deaths assigned to groups No. 144-150 plus those deaths included in Table LXVII which were not associated with abortion, which would mean an *addition* of 2,859 in 1933, or of 5 per 1,000 to the number of live and still births in the year (605,497). On the other hand, owing to multiple births, the number of confinements resulting in a live or still birth is about 1 per cent. less than the total of all the births registered, which would necessitate a *deduction* of that order from the total live and still births. It may be contended, however, that since the mortality risk is greater in a multiple confinement, the number of births gives as good a measure of the exposures to risk as the number of confinements resulting in those births.

The amount of the net correction of mortality rates for all these factors would be so small and would vary so little from year to year or from place to place that its effect on any comparisons between

rates would be inappreciable, and the calculation of maternal mortality from causes No. 144-150 upon the simple total of live and still births is a practical expedient which seems open to little objection.

Ectopic gestation (No. 142) and other accidents of pregnancy other than abortion (No. 143), which are events presumably tending to occur in a constant proportion of pregnancies from causes not usually under control, may also be related to the births without serious objection as giving an approximate relative measure from year to year or from place to place, though not an absolute measure, of the total pregnancies.

It may be urged with some force, however, that with regard to abortion there is less justification for calculating mortality rates from this cause on the basis of the number of live and still births. The risk of death from abortion is a function of the number of abortions, and there is no particular reason to suppose, since natural processes are allowed to have less complete control than formerly in the matter of child-bearing, that the number of abortions has been falling in recent years in proportion to the number of births, nor indeed that the number has necessarily been falling at all. In the absence of knowledge as to the number of abortions, it would seem reasonable to relate the abortion deaths to the number of women of reproductive age in the population, and to calculate an abortion rate on this basis, together with a maternal mortality rate excluding abortion based on the births.

The various rates of mortality calculated on these different bases for comparability with rates in past and future years are given in Tables LXXIII-LXXVII, the principal rates being collected together

Table LXXIII.—Mortality of Women in or associated with child-birth, 1928-33.

		1928.	1929.	1930.	1931.	1932.	1933.
Per 1,000 Live Births	Puerperal sepsis	1.79	1.80	1.92	1.66	1.61	1.83
	Other puerperal causes	2.63	2.53	2.48	2.45	2.60	2.68
	Total puerperal mortality	4.42	4.33	4.40	4.11	4.21	4.51
	Non-puerperal causes†	1.20	1.49	1.19	1.44	1.16	1.43
Per 1,000 Live and Still-births.	Puerperal sepsis	1.72	1.73	1.84	1.59	1.55	1.75
	Other puerperal causes	2.52	2.43	2.38	2.35	2.49	2.57
	Total puerperal mortality	4.25	4.16	4.22	3.95	4.04	4.32
	Non-puerperal causes†	1.15	1.43	1.14	1.38	1.11	1.37
	Puerperal causes other than abortion Non-puerperal causes, excluding deaths associated with abortion.	3.74 1.03	3.63 1.25	3.59 1.03	3.42 1.27	3.45 0.97	3.70 1.21
Per 1,000,000 women aged 15-45.	Abortion (including criminal)	42	43*	50*	43*	46*	47*
	Non-puerperal causes associated with abortion.	9	12‡	8	8	9	10

NOTE.—Criminal abortion deaths are not included in any of the above rates except where specified.

† Associated with pregnancy or child-bearing.

* If corrected for puerperal sepsis deaths having no statement as to duration of pregnancy (see text) the estimated rates for 1929 to 1933 are raised to 46, 53, 46, 47, 50, and the residual rates in the line above are decreased by about 0.04 per 1,000.

‡ Corrected in accordance with the note below Table LXVIII.

Table LXXVI.—Mortality of Married Women at Separate ages from Various Puerperal Causes other than Abortion (per 100,000 Births—live and still); and of Married and Single Women from Abortion (per 1,000,000 living), 1930–32 and 1933.

List No.		Deaths of Married Women per 100,000 Legitimate Live and Still Births.					
		All ages.	15–25.	25–35.	35–45.		
142–150	Diseases of pregnancy, childbirth, etc., excluding abortion	{ 1930–32 343 1933 .. 363	{ 255 291	{ 318 325	{ 482 519		
142	Ectopic gestation	{ 1930–32 12 1933 .. 14	{ 2 3	{ 11 15	{ 22 22		
143	Other accidents of pregnancy (not abortion)	{ 1930–32 3 1933 .. 3	{ 2 5	{ 2 2	{ 5 2		
144	Puerperal hæmorrhage	{ 1930–32 47 1933 .. 45	{ 21 19	{ 39 39	{ 89 84		
145	Puerperal sepsis not returned as post abortive	{ 1930–32 124 1933 .. 131	{ 109 112	{ 121 125	{ 143 161		
146	Puerperal albuminuria and convulsions	{ 1930–32 56 1933 .. 60	{ 54 61	{ 48 51	{ 74 79		
147	Other toxæmias of pregnancy	{ 1930–32 20 1933 .. 21	{ 17 27	{ 19 16	{ 25 28		
148	Puerperal phlegmasia alba dolens, embolism and sudden death	{ 1930–32 29 1933 .. 29	{ 16 16	{ 27 23	{ 49 57		
149	Other accidents of childbirth	{ 1930–32 42 1933 .. 50	{ 27 39	{ 40 46	{ 59 72		
150	Other or unspecified conditions of the puerperal state (not abortion)	{ 1930–32 10 1933 .. 10	{ 6 7	{ 10 8	{ 16 15		
	Deaths assigned to other causes but associated with Nos. 142–150	{ 1933 .. 118	{ 75	{ 103	{ 189		
		Deaths of Married Women per Million living at ages			Deaths of Single Women per Million living.		
		15–25.	25–35.	35–45.	15–25.	25–35.	35–45.
140	Post-abortive sepsis	{ 1930–32 55 1933 .. 46	{ 53 49	{ 43 38	{ 7	{ 6	{ 7
141	Abortion not returned as septic	{ 1930–32 10 1933 .. 14	{ 22 18	{ 25 26	{ 1*	{ 4*	{ 2*
—	Criminal abortion	{ 1930–32 12 1933 .. 17	{ 14 13	{ 5 6	{ 4	{ 11	{ —
—	Total of above	{ 1930–32 77 1933 .. 77	{ 89 79	{ 66 70	{ 12	{ 20	{ 9
—	Deaths assigned to other causes but associated with No. 140–141	{ 1933 .. 17	{ 21	{ 15	{ —	{ 4*	{ 2*

* Note.—These rates are based upon less than 5 deaths.

Mortality attributed to abortion, including criminal cases, is 47 per million women aged 15–45, compared with average rates of 43 in 1926–28 and 45 in 1929–31, and a rate of 46 in 1932 (Tables LXXIII, LXXV). Abortion with sepsis accounts for 26 deaths per million women of childbearing age (23 in 1926–28, 26 in 1929–31, 27 in 1932) and criminal abortion for 9 (5 in 1926–28, 7 in 1929–31,

7 in 1932). The rate for non-puerperal causes associated with abortion is 10, compared with an average of 9 in the preceding 5 years.

Table LXXV gives the rates of mortality per 100,000 total births to women of various ages from separate causes in each year since 1924. The numbers of live and still births to women of specific ages have been estimated by means of the fertility rates (for live births) at various ages calculated in the census years 1921 and 1931 and given in Table LXXXVIII of the Review for 1932. The rates for years between 1921 and 1931 are first estimated by simple interpolation assuming equal decrements of fertility at a given age to have occurred in each year. By applying these to the estimated populations of married and of single women in the year, and adjusting the resulting expected live births to equal in aggregate the actual total of registered live and still births in the year in question, the required numbers of live and still births at each age of mother are obtained. The assumption is necessarily made that all births occur within the age limits 15–45, an approximation which results in a slight depression of all the rates, and it is also assumed that still births form a constant ratio to live births regardless of age. The errors involved in these assumptions are so small in effect that they may be disregarded. For years since 1931 the fertility rates of that year have been applied, and the calculated total then adjusted as before to the realised total, this being tantamount to assuming that since 1931 fertility has changed to an equal relative extent at each age, this being the simplest assumption in the absence of data. Owing to the progressive uncertainty of estimates both of the married and single populations and of the fertility rates with increasing interval from the census, the calculation of the rates in Tables LXXXV–VI can only be carried on for a few years unless, as is hoped, data of age of mother from birth registration becomes available to replace the numbers of births estimated by this method.

The specific age rates for the abortion and other than abortion components of puerperal sepsis cannot be calculated separately prior to 1931, but the combined rates for both forms of puerperal sepsis per 100,000 total births at the stated age have been as follows in the ten years 1924 to 1933.

	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
All ages	134	150	154	151	172	173	184	159	155	175
15–25	110	133	131	118	139	146	139	141	119	139
25–35	122	136	146	141	160	167	179	150	151	163
35–45	182	190	193	201	238	216	242	207	198	246

At ages 15–25 the average of the sepsis rates in the 5 years 1924–28 was 126, and in 1929–33 it was 137, or 9 per cent. higher; at 25–35 the quinquennial averages were 141 and 162, an increase of 15 per cent., and at 35–45 they were 201 and 222, an increase of 10 per cent. The rates of 1933 were equalled or exceeded at

ages 15-25 in each year 1928 to 1931, at 25-35 in 1929-30 only, and at 35-45 not in any of the preceding 9 years. Sudden increases in the sepsis rates are evident in 1925, 1928 and 1933, and pronounced downward movements in 1931 or 1932.

Table LXXV shows that there has been no consistent change in the rate for puerperal sepsis not returned as post-abortive since 1926, the first year for which it can be calculated; the average rate in 1926-29 was 130 per 100,000 births and in 1930-33 it was 128. Amongst married women alone (Table LXXVI) this rate, based upon legitimate births only, is slightly lower than amongst all women (the successive rates in 1928 to 1933 being 137, 136, 137, 123, 113, 131); in 1930-32 the rates were 109 at 15-25, 121 at 25-35 and 143 at 35-45, the corresponding rates in 1933 being 112, 125 and 161.

Despite the decline in fertility, the death rates from post-abortive sepsis per million women living have tended to increase, the average of the rates during 1926-29 being 23, and during the last 4 years 27. This rate is not greatly influenced by age either in single or married women (Table LXXVI), though when based upon the whole population of women it naturally changes with age owing to the changing proportion of the married as age advances. The rates amongst the married were lower in 1933 than in 1930-32 at each age. The total death rates attributed to abortion (including criminal cases) per million married women in 1930-32 were 77 at ages 15-25, 89 at 25-35 and 66 at 35-45; in 1933 the rates were lower at ages under 35. The estimated rates per million single women at the corresponding ages in 1933 were 12, 20 and 9 (Table LXXVI).

Puerperal hæmorrhage tends to decline slightly, the average of the rates in 1931-33 amongst all women being 19, 39 and 89 per 100,000 births at the three ages, compared with 20, 42 and 95 in 1924-26. This is also true of puerperal albuminuria and convulsions, the averages for 1931-33 being 62, 49, 78 at the three ages, compared with 76, 57, 88 for 1924-26, but this decline is offset by the increase of rates for other toxæmias of pregnancy from 10, 6, 8 in 1924-26 to 22, 20, 26 in 1931-33. The increase in mortality rates assigned to "other accidents of childbirth," from average rates of 22, 33, 59 in 1924-28 to 28, 42, 65 in 1929-33, is also partly offset by a fall in the rates for other or unspecified conditions owing to greater precision in certification.

The distribution throughout the country of the mortality ascribed to childbirth is outlined in Table LXXVII. Sepsis mortality was higher, in the towns than the rural districts, and, as in the preceding year, the London rate was lower than that of the rural aggregate. The sepsis rate was highest in North II, I and III, Wales coming next in order; the East gave the lowest rate.

Mortality from non-septic causes was highest in the small towns and lowest in London, the latter rate being the lowest in the table,

as in 1931 and 1932. Wales registered the highest rates, followed by North II, III and IV. The range of regional variation was, as usual, less for septic than non-septic causes.

Table LXXVII—Distribution throughout England and Wales of Mortality of Women in Childbirth, distinguishing Septic and Other Causes, and of Prevalence of Puerperal Fever and Pyrexia, 1933.

	Per 1,000 Live Births.					Per 1,000 Live and Still Births.					"Puerperal Fever" Cases per 100 Deaths.
	Deaths.			Cases.		Deaths.			Cases.		
	Sepsis.	Other causes.	Total.	"Fever."	"Pyrexia."	Sepsis.	Other causes.	Total.	"Fever."	"Pyrexia."	
England and Wales ..	1.83	2.68	4.51	3.6	10.0	1.75	2.57	4.32	3.5	9.6	197
South-East ..	1.66	2.20	3.86	3.7	11.0	1.61	2.13	3.73	3.6	10.7	225
Greater London ..	1.77	2.06	3.83	4.1	12.7	1.72	1.99	3.71	3.9	12.3	229
Remainder of South-East ..	1.49	2.41	3.90	3.3	8.5	1.44	2.33	3.77	3.1	8.2	218
North ..	2.02	3.19	5.21	3.6	9.9	1.93	3.04	4.97	3.4	9.5	179
North I ..	2.27	2.71	4.98	2.7	7.8	2.18	2.60	4.77	2.6	7.5	119
" II ..	2.32	3.53	5.85	3.1	8.1	2.21	3.37	5.58	3.0	7.7	133
" III ..	2.22	3.50	5.72	4.1	10.4	2.12	3.33	5.45	3.9	9.9	184
" IV ..	1.73	3.14	4.87	3.9	11.0	1.65	2.99	4.64	3.7	10.5	224
Midland ..	1.83	2.16	4.00	3.3	9.5	1.76	2.07	3.83	3.2	9.1	181
Midland I ..	1.94	2.04	3.98	3.7	9.9	1.86	1.96	3.82	3.5	9.5	191
" II ..	1.63	2.40	4.03	2.6	8.8	1.56	2.30	3.86	2.5	8.4	160
East ..	1.40	2.46	3.86	3.5	9.3	1.35	2.37	3.71	3.4	8.9	251
South West ..	1.45	2.76	4.21	3.3	10.4	1.39	2.64	4.03	3.1	10.0	225
Wales ..	2.18	3.91	6.09	4.0	6.9	2.06	3.69	5.75	3.8	6.5	184
Wales I ..	2.20	3.85	6.05	4.4	7.1	2.07	3.64	5.71	4.2	6.7	202
" II ..	2.14	4.07	6.21	2.7	6.3	2.01	3.84	5.85	2.6	5.9	129
County Boroughs* ..	1.89	2.58	4.47	4.7	11.5	1.81	2.47	4.27	4.5	11.0	248
Other Urban Districts* ..	1.85	3.01	4.87	2.8	8.6	1.77	2.88	4.65	2.7	8.2	152
Rural Districts* ..	1.74	3.00	4.74	2.5	6.9	1.67	2.87	4.55	2.4	6.6	143
Greater Admin. County London} Outer Ring ..	1.69	1.97	3.67	4.5	14.8	1.64	1.91	3.54	4.4	14.3	267
	1.86	2.14	4.00	3.6	10.5	1.80	2.07	3.87	3.5	10.1	193

* Excluding Greater London.

Puerperal fever notification.—The records of cases of puerperal fever and pyrexia notified are collated with those of births and of deaths from this cause in Table LXXVII. The proportion to live births of puerperal fever cases notified is 36 per 10,000. This rate rose from 30 in 1927 to 40 in 1930, and fell to 35 in 1932, and may have been affected by the compulsory notification of "puerperal pyrexia," which was in force throughout the period, having commenced on October 1, 1926. The records of notifications under both headings will be found in Tables 28-29 in full detail of locality. The highest fever rates were recorded for Wales I, North III and Greater London, the pyrexia rates being highest in Greater London, North IV and the South West. The fever rate was lowest in Midland II, and the pyrexia rate in Wales II.

The proportion of puerperal fever cases to sepsis deaths is lowest in North I and II and in Wales II as in 1932, and highest in the East, Greater London and the South West; the range of variation in the regions being from 119 to 251 cases notified per 100 deaths. In London the ratio was 267.

186. **Crushing by Motor Vehicles (not on railways).**—Apart from 397 deaths on railways and 49 caused by aircraft, there were 5,934 accidental deaths attributed to mechanically-propelled vehicles in 1933, 4,447 of males and 1,487 of females. The rate of mortality per million persons was 147 compared with 141 in 1932, 147 in 1931 and 159 in 1930. In Table LXXVIII, the allocation of deaths to the different types of mechanically-propelled road vehicles is shown. The deaths classified as "Others" in 1933 are made up as follows:—

Motor cab, 41; motor char-a-banc, 61; motor tractor, 1; steam roller, 3; other or undefined motor, 7, and collisions involving a motor vehicle without statement as to which of the vehicles caused the death, 1,416.

It is regrettable that the last of these items is so large, since the lack of specification of the vehicle causing death renders the analysis of Table LXXVIII less complete than it would otherwise have been. It is also regrettable that the distinction between the occupants of vehicles and pedestrians or cyclists cannot always be made from the records of death certification, nor do the records furnish the information necessary for a satisfactory analysis of deaths according to the locality in which the accident occurred.

Table LXXVIII.—Deaths, and Death Rates per Million Living, caused by various Types of Road Motor Vehicles in each year—1928–33.

	Deaths.						Rate per Million Living.					
	1928.	1929.	1930.	1931.	1932.	1933.	1928.	1929.	1930.	1931.	1932.	1933.
Electric tram ..	101	89	73	74	52	66	2.6	2.2	1.8	1.9	1.3	1.6
Motor car ..	1,550	1,660	1,643	1,688	1,646	1,773	39.2	41.9	41.3	42.2	40.9	43.9
Motor van, lorry, etc.	938	1,162	1,273	1,209	1,111	1,180	23.8	29.3	32.0	30.2	27.6	29.2
Motor omnibus ..	557	584	692	529	447	421	14.1	14.7	17.4	13.2	11.1	10.4
Motor cycle ..	1,043	1,162	1,286	1,083	983	965	26.4	29.3	32.3	27.1	24.5	23.9
Others ..	1,007	1,095	1,375	1,309	1,432	1,529	25.5	27.6	34.5	32.7	35.6	37.9
Total motor vehicles	5,196	5,752	6,342	5,882	5,671	5,934	131.6	145.2	159.3	147.3	141.1	147.1

Deaths attributed to the motor omnibus have fallen progressively since 1930, the total registered deaths in the causation of which this type of vehicle was concerned (alone or in collision with some other vehicle) being 852, 699, 595 and 559 in the four years 1930 to 1933. The same applies to the motor cycle, for which the corresponding totals have been 2,091, 1,797, 1,783, 1,727, but for the motor car this total, after remaining almost stationary during 1930–32, rose sharply in 1933 (2,219, 2,257, 2,291, 2,527).

Pedal cycles are known to have been concerned in or responsible for the following accidental deaths:—

	1929.	1930.	1931.	1932.	1933.
Pedal cycles alone	{ M 207	258	235	308	345
	{ F 47	61	84	95	105
Pedal cycle in collision with other vehicles ..	{ M 232	294	309	431	544
	{ F 23	34	35	49	64
Total (see note below Table LXXX) .. P	509	647	663	883	1,058

DIAGRAM 6. DEATH RATES FROM ACCIDENTS CAUSED BY ROAD
MOTOR VEHICLES AT VARIOUS AGES 1931-33.

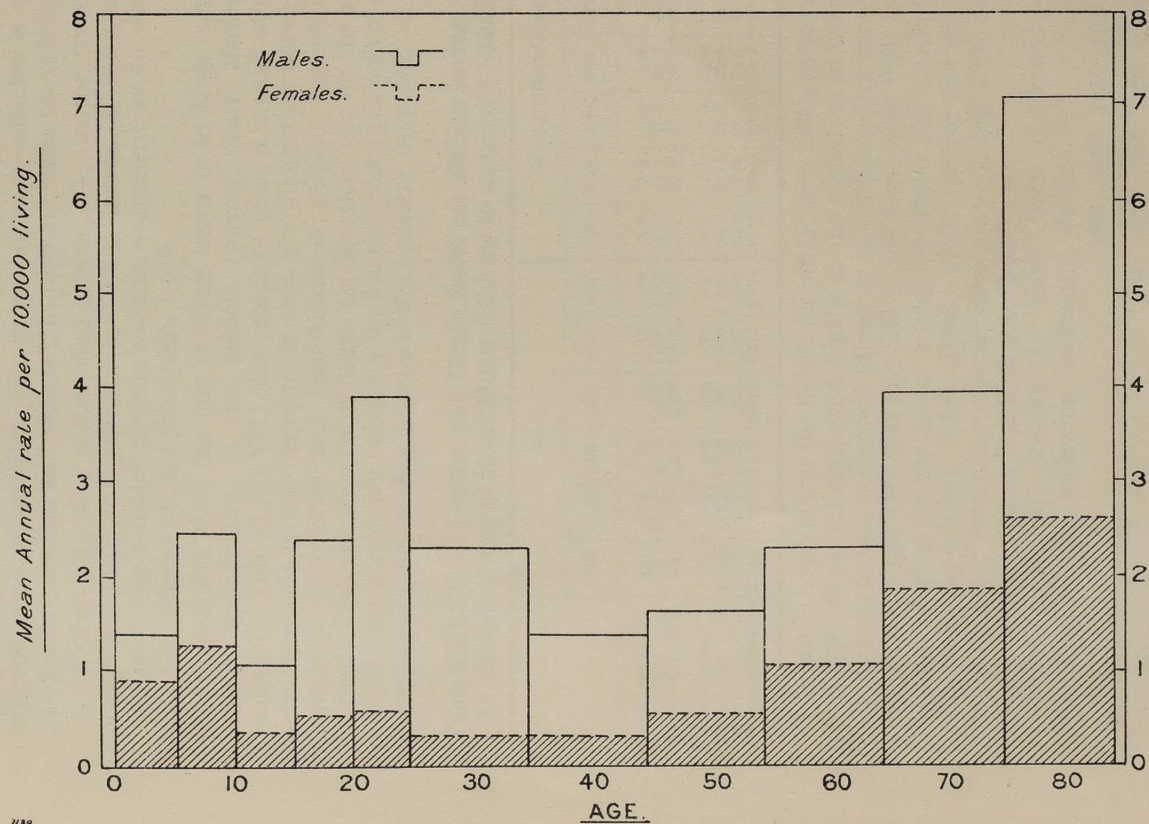


Table LXXIX compares the mean annual death rates per million living due to accidents caused by all forms of road motor vehicles at various ages in 3 triennial periods 1925-27, 1928-30 and 1931-33. In each of these periods the male rate at all ages has been more than three times the female rate. This excess is present at each age, but the ratio of male to female risk increases with age to a maximum exceeding 7 at 20-25, then declines to about 2 at 55-75 and again increases slightly in old age.

Table LXXIX.—Death rates per Million living from All Accidents caused by Road Motor Vehicles, by Sex and Age. 1925-27, 1928-30 and 1931-33.

	Males.			Females.		
	1925-27.	1928-30.	1931-33.	1925-27.	1928-30.	1931-33.
0-	107	142	143	55	87	88
5-	195	250	242	92	129	133
10-	102	132	106	26	40	37
15-	151	231	238	32	50	52
20-	233	365	393	30	57	55
25-	146	221	228	22	31	33
35-	112	147	142	23	33	33
45-	134	166	160	36	57	53
55-	170	239	228	75	95	104
65-	301	400	395	140	190	186
75 and over	490	738	711	179	276	260
All ages	159	226	225	48	71	72

From 1925-27 to 1928-30 the male rate at all ages rose by 42 per cent. and the female rate by 48 per cent. The changes which took place in the mean rates from 1928-30 to 1931-33 were, however, remarkably slight, the female rates remaining almost unchanged at each age under 45, whilst the male rates showed a rise for young adults balanced by a fall for boys of school age and men over 35.

The graphical representation of the relation of mortality rates with age in Diagram 6 clearly indicates the existence of 3 ages of maximal risk, the composite curve being the resultant of the various curves for pedestrians, cyclists and occupants of motor vehicles (which are unfortunately inseparable). These three ages of maximal risk are the age of commencing pedestrian activity uncontrolled by experience, 5-10, the age of great motor driving activity not fully restrained by a sense of responsibility, 20-25, and old age with its physical inability to escape many traffic dangers.

The trend of mortality risks according to age for pedestrians separately in 1933 has been analysed for Great Britain as a whole in the Ministry of Transport's Report on Fatal Road Accidents in that year, and also the numbers of deaths at various ages of motor cyclists and pedal cyclists. The numbers of deaths of pedestrians

resulting from road accidents which were reported to the police during the year, per million total population estimated in Great Britain at each age, as taken from that Report, were as shown below :

Age.	Males.	Females.	Age.	Males.	Females.	Age.	Males.	Females.
0-	149	81	30-	33	13	60-	184	118
5-	219	137	35-	33	18	65-	295	141
10-	44	26	40-	48	23	70-	432	213
15-	30	15	45-	69	32	75-	664	234
20-	23	16	50-	85	47	80-	938	390
25-	14	11	55-	113	78	85-	896	279

At the two ends of life these rates approximate to the mortality rates for 1931-33 comprising all males or females registered as dying as a result of motor accidents in England and Wales (Table LXXIX), but at intermediate ages they bear a ratio to the latter which becomes minimal at ages 20-25 and then increases.

Table 25 analyses according to sex and age the accidental deaths caused by each type of vehicle, and in Table LXXX those caused by the more important motor road vehicles, and also by pedal cycles, during 1931-33 are classified by sex and age. In this table a group of collisions in which a pedal cycle was involved together with another vehicle is shown separately from other collisions but as explained in the note below the table this group does not comprise all such accidents, some being included in other groups.

Table LXXX.—Accidental Deaths* caused by Various types of Road Motor Vehicles and by Pedal Cycles, by Sex and Age. 1931-33.

—		All ages.	Age.													75 & up.
			0-	5-	10-	15-	20-	25-	35-	45-	55-	65-				
Electric tram	M	125	4	5	3	3	2	8	10	17	24	29	20			
	F	67	1	2	1	—	2	2	4	3	12	16	24			
Motor-car	M	3,307	197	426	117	138	224	325	239	348	456	489	348			
	F	1,800	133	235	59	56	78	121	105	199	305	314	195			
Motor-van, lorry	M	2,512	288	488	185	195	182	224	174	180	250	223	123			
	F	988	146	252	56	37	32	33	39	73	105	135	80			
Motor omnibus	M	903	96	143	64	67	53	78	79	88	85	95	55			
	F	494	56	93	26	27	20	30	39	39	69	71	24			
Motor cycle	M	2,424	43	49	13	218	675	643	185	133	162	181	122			
	F	607	33	18	6	47	78	67	52	50	94	98	64			
†Collisions involving pedal cycle	M	1,284	1	22	129	258	168	210	131	141	143	70	11			
	F	148	—	5	19	38	28	22	12	15	6	3	—			
†Other collisions	M	2,160	5	6	15	277	687	649	239	160	76	36	10			
	F	259	7	6	9	41	51	53	34	25	18	12	3			
Other mechanical road transport.	M	272	14	34	16	16	12	26	23	38	38	39	16			
	F	147	10	21	7	9	3	10	8	15	21	26	17			
Total	M	12,987	648	1,173	542	1,172	2,003	2,163	1,080	1,105	1,234	1,162	705			
	F	4,510	386	632	183	255	292	338	293	419	630	675	407			
Pedal cycle	M	888	3	21	67	140	81	96	82	81	117	106	94			
	F	284	5	10	8	20	23	10	10	26	47	74	51			

* Including "open verdicts."

† Comprising only those collisions where it is not known which of the vehicles actually caused death; where this is known the collision is included under the appropriate heading.

The proportion of male to female deaths varies considerably according to the vehicle causing death and according to age, the percentage ratios being as follows :—

	All Ages.						
	0-5.	5-15.	15-25.	25-45.	45-65.	65 and over.	
Motor car	184	148	185	270	250	160	164
Motor bus	183	171	174	255	228	160	158
Motor van, lorry	254	197	219	546	553	242	161
Pedal cycle	313	?	489	514	890	271	160
Motor cycle	399	130	258	714	696	205	187
Collisions between pedal cycle and other vehicle	868	?	629	645	1,003	1,352	2,700

Male excess of deaths is greatest for collisions involving a pedal cycle, motor cycle accidents coming next, and is least for motor car and bus accidents. Even at the early age of 0-5 years the greater risks taken by boys than girls in street play are reflected in the excess of 97 and 71 per cent. for fatalities caused by commercial vehicles and buses respectively and the smaller excess of 48 and 30 per cent. for motor car and motor cycle fatalities, the excess of boys over girls in the population at this age being only 2 per cent. At 5-15 the male excess is greater than at 0-5 for each vehicle, fatalities in which pedal cycles were involved being 5 or 6 times as frequent for boys as for girls, whilst those due to other vehicles were about twice as frequent. The much greater participation of young adult males in the driving of motor cycles and commercial vehicles, and in the riding of pedal cycles, results in male deaths numbering 5 to 10 times the female deaths at 15-45, after which age the contrasts become gradually less except for collisions involving pedal cycles (in which the rider is generally the victim).

Table LXXXI compares the age distributions of deaths, per 1,000 of all ages, in 1931-33 with the corresponding distributions in 1925-30. The quinquennium of age having the greatest number of deaths is 20-25 for accidents involving motor cycles and 5-10 for other types of motor vehicles. For deaths caused by pedal cycles the decennium of age having the greatest number of deaths is 15-25 for males and 65-75 for females, whilst for deaths due to collision involving a pedal cycle 15-25 contributes the greatest mortality for each sex. The distributions of the populations by age, given at the foot of the table, indicate the extent to which the proportions at risk differed in the two periods.

Out of 1,000 male deaths caused by all motor vehicles those of boys at the school ages 5-15 numbered 158 in 1925-30 and 132 in 1931-33, whilst for motor cars alone the proportion fell from 221 to 164 and for motor cycles from 33 to 25. The decline in death rate of boys at ages 10-15 since 1928-30, shown in Table LXXIX, together with these comparisons, seems to indicate that the recent school instruction of boys in the matter of avoiding street accidents has been effective in reducing their excessive liability to these fatalities. Out of 1,000 female deaths caused by motor cars those

Table LXXXI.—Accidental Deaths at Various Ages Caused by Different Types of Road Vehicles, per 1,000 at all ages. 1925–30 and 1931–33.

	Sex.	Period.	All ages.	0–	5–	10–	15–	20–	25–	35–	45–	55–	65–	75 and up
Deaths caused by—														
Electric tram	P	1925–30	1,000	58	45	13	17	26	58	84	132	147	234	186
		1931–33	1,000	26	36	21	16	21	52	73	104	187	235	229
Motor car	M	1925–30	1,000	76	172	49	42	56	77	80	108	130	127	83
		1931–33	1,000	60	129	35	42	68	98	72	105	138	148	105
Motor van, lorry .. .	F	1925–30	1,000	82	166	36	28	34	49	67	111	155	169	103
		1931–33	1,000	74	131	33	31	43	67	58	111	169	175	108
Motor omnibus .. .	P	1925–30	1,000	118	200	98	89	57	77	65	74	89	81	52
		1931–33	1,000	124	212	69	66	61	73	61	72	101	103	58
Motor cycle	M	1925–30	1,000	98	161	77	90	61	87	75	104	103	96	48
		1931–33	1,000	109	169	64	67	52	77	85	91	110	119	57
Motor cycle	F	1925–30	1,000	17	24	9	98	256	228	93	83	75	73	44
		1931–33	1,000	18	20	5	90	279	265	76	55	67	75	50
All mechanically propelled road vehicles	M	1925–30	1,000	68	46	15	91	107	109	56	99	153	159	97
		1931–33	1,000	54	30	10	77	129	110	86	82	155	162	105
Pedal cycle	F	1925–30	1,000	56	105	53	94	143	142	88	94	93	83	49
		1931–33	1,000	50	90	42	90	154	167	83	85	95	90	54
Collisions involving pedal cycle	M	1925–30	1,000	93	152	43	59	63	71	67	98	128	141	85
		1931–33	1,000	86	140	41	57	65	75	65	93	140	149	89
Collisions involving motor cycle	F	1925–30	1,000	3	24	76	158	91	108	92	91	132	119	106
		1931–33	1,000	18	35	28	70	81	35	35	92	165	261	180
Population per 1,000 at all ages .. .	M	1925–30	1,000	87	91	87	95	91	149	131	121	88	45	15
		1931–33	1,000	78	84	88	85	88	164	132	119	94	51	17
	F	1925–30	1,000	79	81	79	87	85	159	143	125	89	51	22
		1931–33	1,000	70	76	79	79	85	162	143	127	96	58	25

at ages 5–15 numbered 202 in 1925–30 and 164 in 1931–33, the corresponding proportions for motor cycles being 61 and 40, but, as Table LXXIX shows, there is no evidence of any recent improvement in the mortality rate for girls of school age when deaths caused by all forms of motor vehicle are combined.

The reduction of the heavy excess mortality of boys over girls since 1925–30 is evidenced by the following ratios of male per 100 female deaths in the two periods, the decline in ratio being greatest at 10–15.

Ages	0–	5–	10–	15–	20–25
1925–30 ..	180	206	362	472	674
1931–33 ..	168	186	296	460	686

Larger proportions of motor car and motor cycle deaths now occur between ages 20 and 35 than formerly (Table LXXXI), the change being greater than can be accounted for by the age distributions of the population. This is doubtless due to the more rapidly increasing use of motor vehicles by young adults than at other ages. The increases noticeable in the proportions at ages over 55 are mainly accounted for by the higher proportion of old people in the populations at risk.

199, 200. **Ill-defined Diseases.**—These headings in the International List of Causes of Death, to which 1,315 deaths have been allocated, exclude the ill-defined diseases of infancy and old age,

Table LXXXII.—Replies to Inquiries respecting Indefinitely Certified Causes of Death, 1933.

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
Croup	11	10	Diphtheria 1, Laryngismus stridulus 3, Laryngitis 3.
Membranous laryngitis	1	1	Diphtheria 1.
Pyæmia, septicæmia, etc.	175	133	Diseases of the teeth and gums 7, Diseases of the tonsils 19, Puerperal sepsis 3, Diseases of the skin 28.
Tuberculosis.. ..	144	144	Tuberculosis of the respiratory system 88, Tuberculosis of central nervous system 5, Tuberculosis of intestines and peritoneum 6, Tuberculosis of vertebral column 7, Tuberculosis of other bones and joints 4, Tuberculosis of skin and subcutaneous tissues 2, Tuberculosis of lymphatic system 7, Disseminated tuberculosis 8, Other forms of tuberculosis 5.
Cancer (part or organ not stated).	1,189	1,118	Part or organ stated in 1,092 cases.
Cerebral tumour (P.M. cases).	281	256	Tuberculosis of central nervous system 3, Cancer 133, Glioma 60.
Tumour of other sites	847	644	Syphilis 6, Cancer 477.
Rheumatism.. ..	602	600	Rheumatic fever 192, Chronic rheumatism 2, Rheumatoid arthritis 2, Rheumatic heart disease 396.
Encephalitis.. ..	217	179	Influenza 25, Polioencephalitis 4, Encephalitis lethargica 69, Tuberculosis of central nervous system 2, Syphilis 10, Other forms of encephalitis 26.
Basal or basic meningitis.	19	15	Cerebro-spinal fever 2, Tuberculosis of central nervous system 4, Meningitis—other forms 4.
Posterior or post basal or post basic meningitis.	33	29	Cerebro-spinal fever 19, Tuberculosis of central nervous system 2, Meningitis—other forms 3.
Cerebro-spinal meningitis	119	112	Cerebro-spinal fever 97, Tuberculosis of central nervous system 1, Meningitis—other forms 8.
Spinal sclerosis ..	22	19	Other diseases of the spinal cord 8, Disseminated sclerosis 8.
Cerebral sclerosis ..	7	7	Disseminated sclerosis 2.
Paraplegia	23	15	Syphilis 1, Other diseases of the spinal cord 4, Disseminated sclerosis 2.

Table LXXXII—continued.

Subject of Inquiry.	Replies received	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
General paralysis (outside asylums).	16	15	General paralysis of the insane 14.
Paralysis	18	14	Other diseases of the spinal cord 1.
Aortitis, arteritis and endarteritis.	102	88	Syphilis 41, Aneurysm 2, Arterio-sclerosis 2.
Fibroid phthisis ..	77	73	Tuberculosis of respiratory system 60, Chronic interstitial pneumonia 8.
Hæmoptysis	23	18	Tuberculosis of respiratory system 9, Aneurysm 1.
Stomatitis	18	18	Thrush, aphthous stomatitis 1.
Stricture of œsophagus	23	19	Cancer 10.
Hæmatemesis ..	25	19	Cancer 3, Ulcer of stomach or duodenum 10.
Pyloric stenosis, obstruction, etc.	48	43	Cancer 13, Ulcer of stomach or duodenum 24.
Jaundice	41	29	Cancer 4, Biliary calculi 3.
Peritonitis	95	84	Influenza 1, Cancer 9, Ulcer of stomach or duodenum 6, Appendicitis 22, Hernia 2, Intestinal obstruction 4, Puerperal sepsis 5.
Pemphigus of infants	41	36	Syphilis 6.
Hydrocephalus ..	52	46	Cerebro-spinal fever 2, Tuberculosis of central nervous system 2, Congenital hydrocephalus 31.
Violence	457	433	Precise form of suicide 106, Drowning 3, Injury by fall 68, Injury in mines and quarries 27, Injury by crushing 95.
Syncope, Heart Failure.	116	100	Influenza 1, Tuberculosis of respiratory system 2, Diseases of the heart 61, Arterio-sclerosis 5, Bronchitis 5.
Operation	590	561	Cancer 40, Tumours of female genital organs 50, Ulcer of stomach or duodenum 47, Appendicitis 13, Hernia, Intestinal obstruction 44, Biliary calculi 88, Other diseases of the gall bladder 21, Diseases of the prostate 22, Diseases of the female genital organs 38, Congenital malformations 4, Violence 7.
Other indefinite forms of certification.	2,356	1,988	—
Total	7,788	6,866	—

158 and 162 (b). In the more comprehensive sense resulting from their inclusion, the deaths from ill-defined causes in 1933 numbered 19,300, or 3·89 per cent. of the total, as compared with 4·19 in 1932 and 9·67 in 1911.

Inquiries sent to medical practitioners and coroners requesting further information as to indefinitely certified deaths amounted to 8,485, and to these 7,788 replies were received, with results to classification, some of the most important of which are set out in Table LXXXII.

The total additions to certain definite headings resulting from these inquiries were as follows:—To influenza, 75; to encephalitis lethargica, 72; to cerebro-spinal fever, 122; to tuberculosis of the respiratory system, 186; to other forms of tuberculosis, 117; to venereal diseases, 133; to cancer, 748; to diseases of the spinal cord, 29; to general paralysis of the insane, 16; to disseminated sclerosis, 17; to arterio-sclerosis, 40; to ulcer of stomach and duodenum, 140; to appendicitis, 63; to biliary calculi, 113; to chronic nephritis, 57; to diseases of the prostate, 55; to puerperal sepsis, 81; to congenital malformations, 70.

In addition to the foregoing, 1,821 inquiries were addressed to medical practitioners who had initialled statement "B" on the back of the new form of medical certificate, thereby indicating the possibility of their being in a position to furnish additional information respecting the certified cause of death as the result of a P.M. or laboratory examination which was not available at the time of signing the certificate. Of the 1,582 replies received to these inquiries, 810 amended the original certification.

Anæsthetics.—The usual annual statement of deaths during or connected with the administration of an anæsthetic is continued. This is obtained by secondary tabulation of these deaths, since the primary tabulation, represented by Table 21, classified all such deaths to the disease or injury on account of which the anæsthetic was administered.

The total number of deaths in Table LXXXIII, 768, is 19 more than in 1932, and is the largest number yet recorded. During the years for which fully comparable figures can be stated these deaths first increased slowly from 276 in 1911 to 366 in 1920, declined to 336 in 1922, rose to 446 and remained about that level to 1925. They then increased rapidly to 730 in 1929, and have risen further in the last two years.

For the years before 1911 the record is contained in the tables of accidental deaths, but certain causes—strangulated hernia and cancer—were at this time preferred in tabulation to the anæsthetic used. In 1933 the 768 deaths included 113 associated with cancer, and 40 with hernia. So for comparison with the years prior to 1911 the number of deaths should be reduced to 615. But during 1901–10 the deaths ranged from 133 (1901) to 234 (1910).

The increase since 1911-15 is very general in its application to sex and age, but is relatively greater at ages over 55, and least for males aged 25-45.

Prior to 1921 deaths of males were in excess of those of females

Table LXXXV.—Deaths under or associated with the Administration of Various Anæsthetics in each year, 1922 to 1933.

	Sex.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
<i>Anæsthetics of the Methane series:—</i>													
Chloroform (alone) ..	M.	36	54	56	43	54	48	75	63	51	58	52	52
	F.	27	33	32	40	47	53	36	41	37	37	36	31
Ether (alone) ..	M.	39	73	60	61	105	101	118	142	126	134	130	134
	F.	31	50	52	52	67	72	108	121	130	114	118	115
Chloroform and Ether	M.	48	73	90	91	89	100	120	116	115	126	103	91
	F.	34	53	61	57	78	69	80	93	87	79	68	87
A.C.E. mixture ..	M.	3	10	9	11	9	9	5	3	1	10	3	4
	F.	6	6	2	3	8	2	—	6	3	—	5	1
Ether and Ethyl chloride	M.	—	1	1	7	10	15	9	12	16	28	24	31
	F.	1	—	1	3	7	17	7	13	16	10	19	26
Other mixtures, including chloroform or ether.*	M.	1	5	3	5	4	4	6	8	5	2	8	6
	F.	1	5	5	2	7	7	3	4	5	8	11	11
Ethanesal ..	M.	1	1	—	1	—	—	—	—	—	—	—	—
	F.	5	—	—	—	—	—	—	—	—	—	—	—
Ethyl chloride (alone)	M.	1	3	1	5	4	8	6	7	6	3	7	8
	F.	1	3	1	6	3	6	3	3	4	11	7	4
Barbituric Acid group—Nembutal, Evipan	M.	—	—	—	—	—	—	—	—	—	—	—	1
	F.	—	—	—	—	—	—	—	—	—	3	—	1
Avertin (alone) ..	M.	—	—	—	—	—	—	—	1	1	2	5	5
	F.	—	—	—	—	—	—	—	1	1	3	4	4
Avertin with cocaine derivative.	M.	—	—	—	—	—	—	—	—	—	1	2	—
	F.	—	—	—	—	—	—	—	—	—	—	—	—
Nitrous oxide ..	M.	6	8	9	5	9	13	18	27	23	21	36	34
	F.	1	6	4	4	6	19	12	11	18	22	27	24
Opium or Morphine and their preparations with atropine, hyoscyne or cocaine derivative.	M.	—	—	—	1	—	1	—	—	1	—	1	—
	F.	—	1	—	—	—	—	—	—	1	1	1	—
<i>Cocaine and its preparations and substitutes (without any of above):—</i>													
Stovaine ..	M.	5	6	2	2	3	4	2	3	4	2	6	5
	F.	6	—	1	5	6	5	3	6	3	2	6	5
Novocaine ..	M.	3	—	2	2	2	5	9	12	10	6	20	18
	F.	3	1	1	2	1	3	6	3	11	4	9	8
Percaïne ..	M.	—	—	—	—	—	—	—	1	7	10	11	—
	F.	—	—	—	—	—	—	—	1	2	6	13	13
Others ..	M.	—	—	—	—	2	4	2	7	3	7	8	18
	F.	1	—	2	1	3	1	4	4	2	4	5	10
<i>Miscellaneous or unspecified, including combinations of, or containing the above, not distinguished.</i>	M.	42	28	12	15	15	16	14	13	12	7	3	7
	F.	34	26	22	18	17	14	10	9	12	5	2	3
Total ..	M.	185	262	245	249	306	328	384	414	375	413	416	425
	F.	151	184	184	193	250	268	272	316	332	310	333	343

* Including combinations of chloroform or ether with morphia, atropine, nembutal or cocaine derivatives or substitutes.

at almost every age; but in each year since, except 1923, females have been in excess at 25-45 and in a few years at 15-25 and 45-55 also.

The anæsthetic agents recorded on death certificates have altered considerably in recent years, as may be seen from Table LXXXV. A further increase is recorded in 1933 in the deaths associated with ethyl chloride in combination with ether, which numbered 57. The increasing employment of cocaine derivatives is reflected in the very rapid rise in the number of deaths associated with this group of anæsthetics, from 38 in 1931 to 86 in 1933.

It need scarcely be pointed out that these fatalities depend upon the extent to which the various agents are used as well as upon the risk attaching to them. But unfortunately the deaths associated with each type of anæsthetic cannot be collated with the number of its administrations. It is not even possible to say whether, or to what extent, the rapid increase in the number of these deaths implies increased mortality under anæsthetics. The number of administrations is known to be increasing very rapidly, but cannot be estimated. The deaths tabulated, moreover, can only be those under, not those caused by, anæsthesia. It is impossible from certification to distinguish between deaths from operation under anæsthesia and deaths due to the anæsthetic itself.

Of the 768 deaths in 1933 shown in Table LXXXIV, 618 (80 per cent.) were classed to the 22 headings enumerated in Table LXXXVI, the remainder being of very varied causation. The composition of this list changes little from year to year.

Table LXXXVI.—Classification of Deaths under or associated with Anæsthesia, 1933.

	Cause to which Death was assigned.	Males.	Females.		Cause to which Death was assigned.	Males	Females.
24-32	Non-respiratory tuberculosis.	9	7	122 b	Intestinal obstruction.	24	17
45-53	Cancer	65	48	126	Biliary calculi ..	7	9
66 b	Exophthalmic goitre	2	11	127 (pt.)	Diseases of the gall bladder.	3	8
89 b	Diseases of the mastoid sinus.	12	14	136 a	Stricture of the urethra.	4	—
104	Diseases of the nasal fossæ and annexa.	5	1	137	Diseases of the prostate.	14	—
110: 1	Empyema	14	5	138 (pt.)	Circumcision ..	5	—
115: 1	Extraction of teeth.	13	6	54 a (pt.)	Uterine fibroids ..	—	10
115: 3	Diseases of the tonsils.	26	13	140-150	Childbirth and abortion.	—	50
117	Ulcer of the stomach or duodenum.	31	4	154	Acute infective osteomyelitis.	5	2
121	Appendicitis ..	38	27	157	Congenital malformations.	12	7
122 a	Hernia	30	10	163-198	Violence	30	20

The numbers of deaths reported from different classes of institutions, etc., in various regions of the country are stated in Table LXXXVII, in which, as place of occurrence is evidently of more interest for these deaths than place of residence, they have been tabulated by area of registration.

Table LXXXVII.—Deaths under Anæsthetics Registered in 1933.
Distribution by Part of Country and Place of Occurrence.

	Greater London.	South-East excluding Greater London.	North.	Midland.	East.	South-West.	Wales.	England and Wales.
Hospitals	{M. F. 89 71	{44 31	{119 90	{34 21	{15 14	{11 13	{19 13	{331 253
Poor Law Institutions	{M. F. 25 23	{1 2	{22 21	{10 12	{1 —	{— 1	{1 2	{60 61
Mental Hospitals ..	{M. F. — —	{— —	{— —	{— —	{— —	{— —	{— —	{— —
Nursing Homes	{M. F. 3 6	{1 2	{4 4	{2 —	{2 —	{1 —	{2 —	{15 12
Elsewhere	{M. F. 2 1	{1 3	{4 7	{6 1	{3 3	{1 2	{2 —	{19 17
Total	{M. F. 119 101	{47 38	{149 122	{52 34	{21 17	{13 16	{24 15	{425 343

Since most of these deaths occur in institutions to which patients are drawn from wide areas, it is not surprising to find that the ratio of anæsthetic deaths to resident population is highest in Greater London, 26 to each million, and lowest in the Midland and South-West regions, where the ratios are respectively 12 and 14 to each million.

Status Lymphaticus and Anæsthetics.—The deaths from status lymphaticus primarily classified to diseases of the thymus (67) in Table 21 reached a maximum of 202 in 1929, but then fell somewhat precipitately to 138 in 1930. In the last 3 years they have numbered 143, 154 and 153. In addition to these 153 deaths, there were, in 1933, 50 deaths under anæsthetics in the case of which record was made of the presence of this condition but which have been referred in tabulation to the condition occasioning the administration of the anæsthetic.

The sex and age distribution of these was as follows:—

	All Ages.	0—	5—	10—	15—	20—	25—	35—
Males	32	14	8	3	2	4	1	—
Females	18	7	5	1	1	1	2	1

WINTER MORTALITY FROM VARIOUS CAUSES IN 1921–33 IN RELATION TO THE MEAN AIR TEMPERATURE AND INFLUENZA RATE.

In the Supplement to the 81st Annual Report, all deaths registered during the influenza pandemic of 1918–19 with mention of influenza on the certificate were tabulated according to the associated cause, and estimates were also made of the deaths attributed to phthisis, pneumonia, bronchitis and heart disease, which, although influenza was not mentioned as a contributory cause, probably resulted from the epidemic. Thus, during the first quarter of 1919 it was estimated that 32,212 deaths assigned to influenza, 4,738 to pneumonia, 7,402 to bronchitis, 2,010 to heart disease and 821 to phthisis were really attributable to the epidemic. The importance of influenza epidemics in producing fluctuations in the annual deaths attributed to various causes has become increasingly manifest in the last decade and has been frequently pointed out in the Annual Reviews, though no attempt has been made to estimate the amount of this effect since the 1918–19 epidemic.

Since 1920 the epidemics have been virtually confined to the first quarter of the year, as may be seen from the distributions of individual months in the 13 years 1921–33 according to the annual death-rate from influenza per 10,000 in that month (Table LXXXVIII).

Table LXXXVIII.—Months of 1921–1933 distributed according to their Influenza death-rate, and months of the first quarters of these years distributed also according to their Mean Air Temperatures.

Influenza death-rate per 10,000.	December.	January.	February.	March.	April.	Other months.	Months of March quarters distributed according to their mean air temperatures.						
							33°—	35°—	37°—	39°—	41°—	43°—	45°—
0—	12	7	5	6	9	13	—	—	1	2	7	5	3
5—	1	3	—	3	4	—	—	1	—	3	1	1	—
10—	—	1	3	—	—	—	—	—	1	3	1	—	1
15—	—	—	1	1	—	—	—	—	1	—	—	—	—
20—	—	—	2	—	—	—	—	—	—	1	2	—	—
25—	—	—	—	—	—	—	—	—	—	—	—	—	—
30—	—	2	2	—	—	—	—	—	1	—	—	—	—
35—	—	—	—	1	—	—	—	—	—	—	—	1	—

Any correlation between influenza deaths and those attributed to other causes is therefore most likely to be found in the mortalities of January, February and March.

The tabulation of monthly deaths from separate causes (Table 23) since 1921 makes it possible to calculate the deaths expected from a given cause in January, February or March on the basis of the general secular trend due to changes in population, or prevalence of the disease or fashions in certification, and then to relate the fluctuations above or below the expected number to two factors not quite independent of one another, the mean air temperature of the month in England and Wales and the influenza death rate in the

month. The mean air temperatures of the three months in the 12 years 1921-32 were respectively 41.1°F ., 40.0°F . and 42.4°F .; and the meteorological conditions may be regarded as sufficiently alike to allow January, February and March to be dealt with together. The tendency for coldness of these months to be attended by greater influenza mortality is indicated by the distribution of the 39 first quarters' months of the 13 years according to their mean temperatures (Table LXXXVIII).

Table LXXXIX shows the percentage ratios of actual to expected deaths attributed to various causes in groups of 4 of the 36 months of January, February and March in the 12 years 1921-32, after first arranging them in ascending order of influenza death rate, separating into the 12 months of lowest rate, 12 of intermediate and 12 of highest rate, and then arranging each set of 12 in order of decreasing mean air temperature in England and Wales. The expected deaths from a given cause in each month have been calculated by drawing a straight line through the mean annual deaths in 1921-26 and in 1927-32, and assuming that the average rate of annual decrement due to progressive secular changes, as given by the slope of this line, was the same for each individual month as for the whole year. The total January deaths in 1921-32 were then distributed over the 12 Januaries on this assumption, and so for the February and March deaths. The deaths which actually occurred in a group of 4 months are then expressed as a percentage of the sum of the calculated deaths in those months.

The mean influenza death rates in each group of months are given at the head of the table and the mean air temperatures in England and Wales at the foot. In the 12 months of lowest influenza the rate ranged from 184 to 346 per million, in the 12 moderate months from 352 to 1,007, and in the 12 epidemic months of highest influenza from 1,012 to 3,519. The mean air temperatures of the 3 groups of 12 were 42.5° , 41.1° and 39.9° , respectively, indicating the tendency for influenza mortality to be greater when the temperature is lower. In Diagram 7 the effect of this correlation between the two variables, which must be borne in mind when using Table LXXXIX, is almost eliminated by plotting the curves on a scale of temperature, so that the effect of the presence of influenza under given temperature conditions is represented by the amount of vertical separation of the graphs at that temperature, and the effect of increasing cold between certain limits of influenza mortality can be inferred from the amount of upward or downward slope of the graphs. As a rough measure of the relative importance of the two factors in their association with the deaths attributed to a specific cause, one may compare the average vertical distance between the overlapping portions of the graphs for high and low influenza with the difference between the vertical heights of the extremities of the graph for low influenza. It is not safe to draw conclusions from the slope of the graph for high influenza.

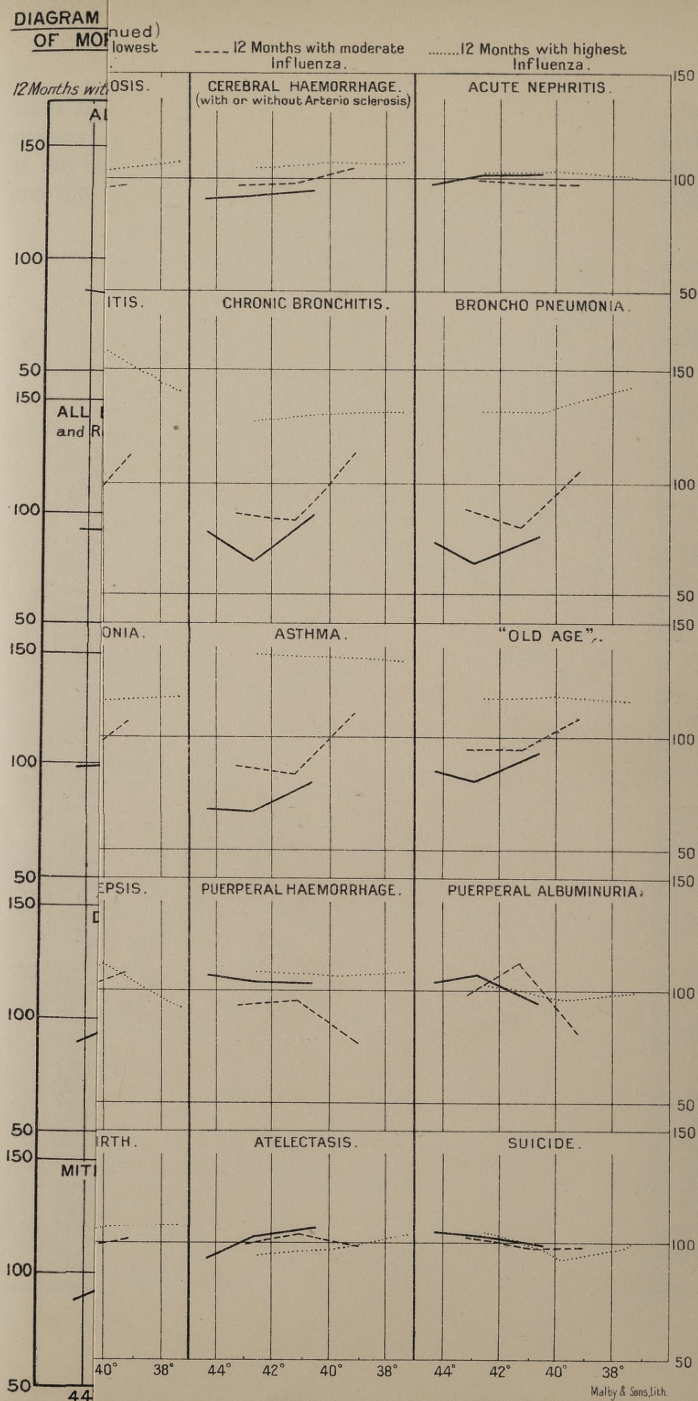


DIAGRAM 7. ASSOCIATION WITH INFLUENZA AND MEAN AIR TEMPERATURE OF MORTALITY FROM VARIOUS CAUSES IN THE FIRST THREE MONTHS OF THE YEARS 1921-1932.

12 Months with lowest Influenza — 12 Months with moderate Influenza — 12 Months with highest Influenza

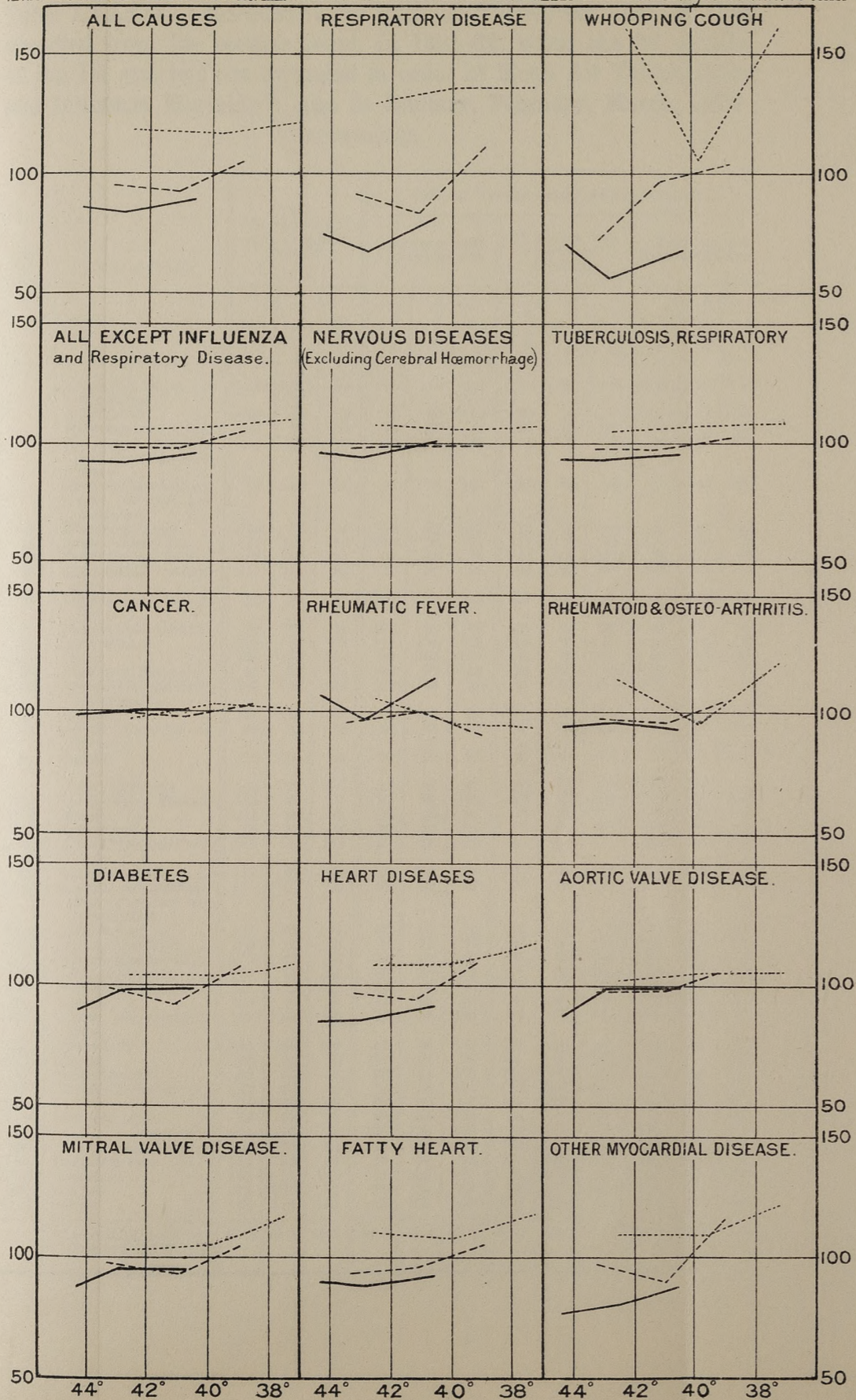


DIAGRAM 7 (Continued)

— 12 Months with lowest Influenza. - - - 12 Months with moderate Influenza. 12 Months with highest Influenza.

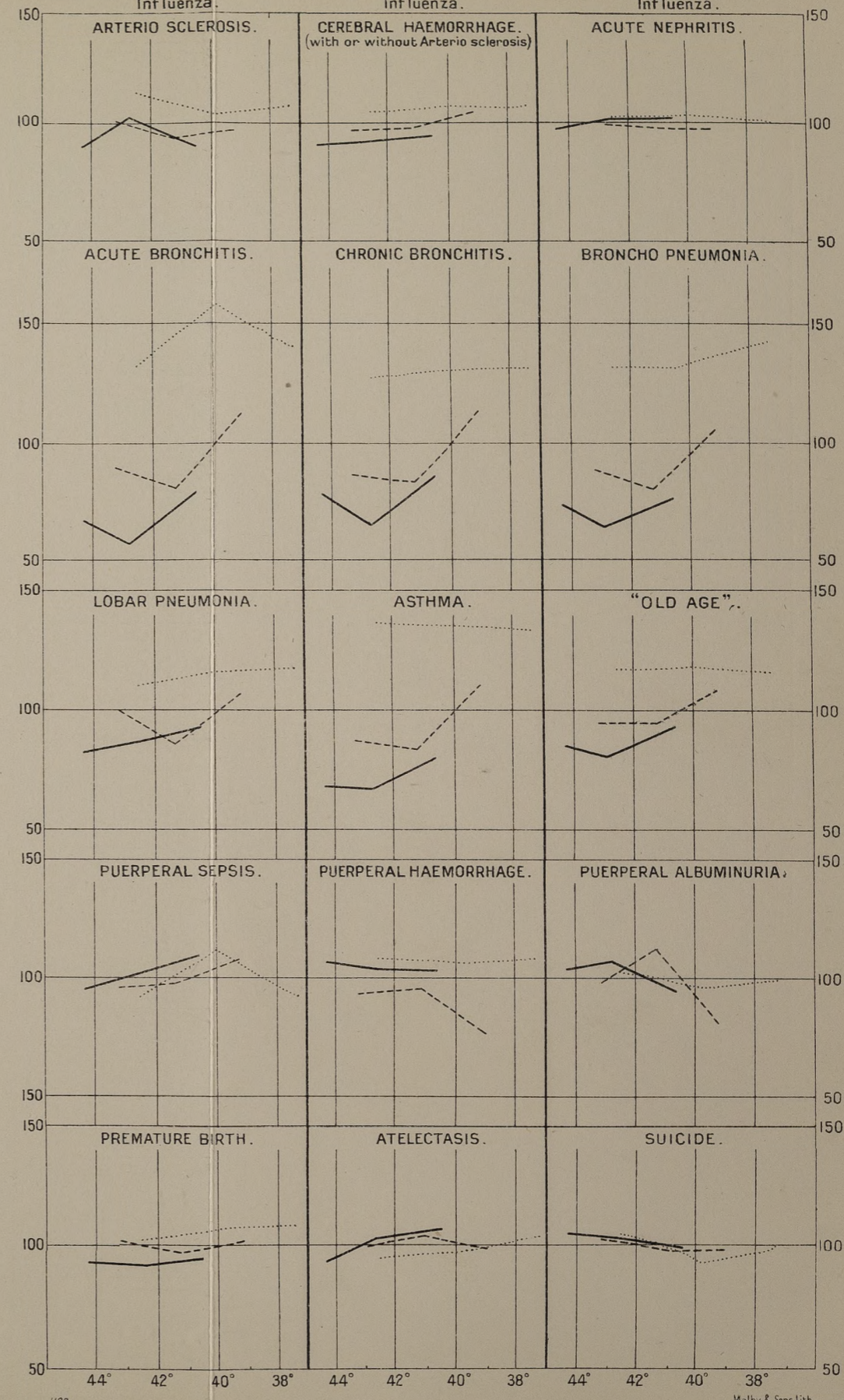


Table LXXXIX.—Mortality from Various Causes, per cent. of that expected from the secular trend, in 1921-32, when the 36 months of the 1st quarters are arranged in order of Mean Air Temperature and Influenza Mortality: also in January, February, March, 1933 separately.

List No. (1931).	Cause of Death.	1933. Death rate per cent. of rate in 1928-32.			1921-32. Actual deaths per 100 expected.								
		Jan.	Feb.	Mar.	12 months with lowest Influenza.			12 months with moderate Influenza.			12 months with highest Influenza.		
					4 Warm.	4 Medium.	4 Cold.	4 Warm.	4 Medium.	4 Cold.	4 Warm.	4 Medium.	4 Cold.
	INFLUENZA (Mean rate per Million).	3,356	2,305	354	290	260	246	571	720	594	2,032	1,877	2,212
	ALL CAUSES	138	105	78	85	83	89	95	93	103	117	115	120
	RESPIRATORY DISEASES	141	86	52	74	67	81	91	83	109	129	135	135
	All except Influenza and Respiratory Diseases.	115	102	90	92	92	96	98	97	104	105	106	109
	NERVOUS DISEASES except cerebral hæmorrhage.	94	94	78	95	93	100	97	98	99	107	105	106
9	Whooping Cough . . .	128	78	44	70	55	67	72	96	103	169	106	161
16	Acute Poliomyelitis . .	152	174	85	100	76	79	111	116	98	116	88	126
18	Cerebro spinal fever . .	183	160	111	94	68	70	112	109	111	90	145	91
23	Tuberculosis, respiratory.	117	101	84	92	92	95	98	98	102	105	107	111
24	Tuberculosis, Nervous System.	82	89	97	104	98	99	99	100	101	98	103	96
25	Tuberculosis, Intestinal	83	75	81	102	99	102	105	93	98	96	108	98
36	Septicæmia	109	85	75	114	108	120	86	97	79	111	98	89
45-55	Cancer	109	102	103	99	100	100	100	99	101	98	102	101
56	Rheumatic Fever . . .	97	87	84	106	97	115	96	100	92	106	95	94
57(2)	Rheumatoid and Osteoarthritis.	107	102	84	92	94	91	97	95	104	114	95	118
59	Diabetes	121	108	101	89	97	98	99	92	106	104	104	108
83	General Paralysis of Insane.	98	98	78	88	98	97	96	93	104	109	117	103
85	Epilepsy	98	104	84	93	92	96	100	102	105	98	107	105
	HEART DISEASES . . .	144	117	96	84	85	91	96	94	109	108	109	117
92(1)	Aortic Valve Disease	110	97	84	87	99	100	98	98	105	102	105	105
92(2)	Mitral	114	90	82	88	95	95	98	94	104	103	105	116
93b1	Fatty heart	96	80	75	90	89	93	94	96	103	110	107	116
93b2, 3	} Other Myocardial disease.	169	136	105	77	80	88	97	91	111	109	109	120
93c													
97	Arterio sclerosis . . .	111	99	84	90	102	90	101	95	97	113	104	107
82,97(1)	Cerebral hæmorrhage with or without arteriosclerosis.	111	107	90	91	92	96	97	97	105	105	108	108
106(a)	Acute Bronchitis . . .	177	92	44	66	57	78	89	81	112	132	158	140
106(b)	Chronic Bronchitis . .	143	88	55	78	66	87	87	84	113	128	134	135
107	Broncho-pneumonia . .	155	87	54	72	64	75	87	78	106	137	137	142
108	Lobar pneumonia . . .	116	83	60	82	86	92	100	86	107	110	116	118
109	Pneumonia undefined .	115	73	55	76	70	84	98	84	110	119	139	133
112	Asthma	154	80	46	67	66	80	87	84	110	136	135	133
117	Gastric and duodenal ulcer.	103	89	88	97	98	104	96	96	102	100	107	96
121	Appendicitis	114	106	105	99	99	100	104	98	101	100	99	99
118(1)	Gastritis	68	77	73	101	101	90	101	99	100	93	114	103
130	Acute Nephritis	83	81	96	98	101	102	100	98	97	102	102	101
131	Chronic Nephritis . . .	101	85	88	91	98	102	99	100	104	101	98	105
135(a)	Cystitis	74	95	62	89	92	93	104	104	94	109	113	102
140, 145	Puerperal sepsis	78	77	78	95	100	109	95	97	108	91	111	93
144	hæmorrhage	104	112	76	106	104	103	93	95	78	108	107	109
146	albuminuria	66	79	62	104	107	95	99	113	82	103	97	99
159	Premature birth	113	92	84	93	92	95	101	98	102	102	108	110
161(a)	Atelectasis	130	75	104	93	102	107	99	104	99	95	97	104
162	Old Age	113	101	72	85	80	93	95	95	108	117	117	116
163-171	Suicide	113	113	116	105	103	98	103	97	97	106	92	98
	Mean Air Temperature (England and Wales)	37.5	40.1	45.4	44.3	42.8	40.5	43.2	41.1	39.1	42.5	39.8	37.3

A simple measure of the amount of increase in the mortality attributed to various causes during influenza epidemics, based upon comparison of months of the same average temperature, is obtained by calculating the vertical distance between the uppermost and lowest graphs at 41.5° F., the mid-point on the temperature scale of the overlapping portion of these graphs, and expressing it as a percentage of the height of the lower graph at that temperature. This indicates the percentage increase in mortality which accompanied a known moderate degree of epidemic influenza when freed from the effects of temperature, and has been calculated for certain causes in Table XC. When multiplied by the deaths per month which occurred during the 8 coldest months of low influenza rate, comparative figures are obtained in the second column representing the monthly excess of deaths attributed to each group of causes which was associated with the monthly excess of influenza deaths at the head of the column, and in parentheses these have been expressed in terms of 100 influenza deaths.

Table XC.—Increase in Monthly Mortality associated with Epidemic Influenza, comparing months of similar temperature in the March quarters of 1921–32.

	Increase per cent. (from graphs at 41.5° F.).	Estimated excess of deaths per month.
Influenza	656	5,360 (100)
Whooping-cough	136	431 (8)
Tuberculosis, respiratory ..	13	361 (7)
Diseases of Respiratory System	74	5,408 (101)
Heart diseases	22	1,558 (29)
Old age	34	701 (13)
Other causes	—	1,070 (20)
All causes except Influenza ..	22	9,529 (178)

Table LXXXIX also gives the death-rates in January, 1933, from the various causes, expressed as percentages of the mean rate in the previous 5 Januaries, and similarly for February and March. Compared with the previous 12 years, January, 1933 was remarkable in having the highest influenza death-rate of any January and the lowest mean air temperature save in January, 1929. February had the highest influenza rate of any February except 1927 and 1929, its mean air temperature being average, whilst March had a low influenza rate and the highest mean air temperature of any March in the period.

Whooping-cough.—Mortality attributed to this cause in the first quarter of the year was more profoundly associated with the

presence of influenza than that attributed to any of the causes in Diagram 7 except perhaps acute bronchitis and broncho-pneumonia. Temperature seems to have no consistent relation with mortality in months of low or moderate influenza level. After allowing for the possible effects of coldness (Table XC), whooping-cough mortality was more than doubled, the average excess amounting to over 400 deaths per month, or about 8 to each 100 additional influenza deaths. It is, therefore, a matter of some importance to ascertain the reason for this.

In the absence of national notification statistics of whooping-cough it remains uncertain whether it is the prevalence or the fatality of whooping-cough which tends to move in sympathy with influenza mortality. In the former event it would be necessary to postulate some common factor, but in the latter event the explanation might lie in superimposed catarrhal infections transmitted from persons with influenza or its secondary infections to children with whooping-cough.

Deaths attributed to whooping-cough stated jointly with influenza are assigned to the former, but during the epidemic of January and February, 1933, influenza was mentioned on only 22 out of 801 certificates of deaths classed to whooping-cough. Only a small fraction of the whooping-cough deaths in excess of expectation during influenza epidemics have any mention of influenza as a complication, and if the explanation lies in a superimposed infection which is specially fatal, it is evident that the double infection is not usually recognised as such.

Respiratory diseases.—Deaths attributed to respiratory disease with mention of influenza are of course assigned to the latter, and the respiratory deaths in Table LXXXIX and Diagram 7 are those without mention of influenza as an associated cause. When months of low or moderate influenza mortality are compared, it is evident from the graphs that a low mean air temperature tends to be accompanied by a rise in mortality, but that this is not so important as the association with influenza in months of similar temperature. The temperature effect is more pronounced for bronchitis and broncho-pneumonia than for lobar pneumonia, and the graphs suggest an optimum mean temperature for the bronchial affections in the March quarter round about 42° F., high or low average monthly temperatures having been alike more conducive to mortality in the period under review.

The association with influenza is greatest for acute bronchitis, deaths so attributed being more than doubled during influenza epidemics in winter months of average temperature. For broncho-pneumonia and chronic bronchitis the association is almost as great, but for lobar pneumonia the enhancement of mortality during epidemics has been only of the order of 20 per cent. Asthma shows a degree of association both with temperature and influenza similar to that of broncho-pneumonia. After allowing for the effect

of low temperatures in enhancing mortality from both influenza and respiratory disease, Table XC shows that the latter increased by 74 per cent. during epidemics, the excess of deaths attributed to respiratory diseases without mention of influenza being approximately equal to the excess of deaths attributed to influenza (with or without respiratory complications).

Heart Disease.—Mortality manifests a slight increase with falling temperature in the influenza-free months, this being most apparent for aortic disease and for myocardial disease other than fatty. The bulk of the mortality from other myocardial disease is, of course, that of old people. After allowing for coldness as a common factor in enhancing mortality, it appears (Table XC) that influenza epidemics have been accompanied by an increase of about 22 per cent. in mortality attributed to heart diseases, and that this is equivalent to an excess of more than 1,500 deaths per month. The separation between the graphs in Diagram 7 at 41.5° indicates that deaths from aortic disease were increased by about 5 per cent., mitral disease by about 10 per cent., fatty heart by about 18 per cent. and other myocardial disease by about 22 per cent. during the months with high influenza mortality. It must be remembered that deaths attributed to bronchitis with associated myocardial disease, a description now very frequently used on death certificates, are assigned by the operation of rules of precedence to the heart disease, and it would probably be found that most of the increase in myocardial disease recorded during influenza epidemics consists of such deaths.

Deaths assigned to "old age" without mention of influenza were increased by 34 per cent., corresponding to an excess of 700 deaths per month during epidemics, and this and the high rates of increase for "myocardial disease" and for "rheumatoid and osteo-arthritis" suggest that a great deal of extra mortality results amongst old people during epidemics of influenza for which the latter is not recognised as a causative factor, or at least not mentioned on the death certificate as such.

Arterio-sclerosis shows no consistent relation with temperature, but cerebral hæmorrhage deaths increased slightly with coldness. Mortality from each of these causes was enhanced during severe influenza epidemics.

Death-rates from *phthisis* increase slightly with greater coldness, but are more sensitive to the presence of influenza, an average excess of 361 deaths per month occurring during epidemics (Table XC), or about 7 to each 100 influenza deaths. Examination of the mortality in months subsequent to epidemics shows, however, a compensatory fall, and the excess represents in the main an acceleration of the fatal issue in tuberculous patients, with resulting concentration of the year's deaths into the first quarter, rather than an addition to the year's mortality from this cause.

Of other causes, cancer, rheumatic fever and acute nephritis show a conspicuous absence of any effect, either of influenza or of air temperature (Diagram 7), upon the mortality assigned to them, and no consistent relation with either factor is shown by puerperal sepsis, hæmorrhage or albuminuria. Deaths from premature birth are only slightly influenced by temperature, but are considerably increased in numbers during influenza epidemics, whereas atelectasis deaths increase with coldness but are less frequent during influenza epidemics. Suicides were more frequent when the winter months were warm than when they were unusually cold, and no relation with influenza is apparent.

Table XC shows that, after allowance for the association with temperature, mortality from all causes other than influenza increased by 22 per cent. during influenza epidemics, the excess amounting to 178 deaths to every 100 additional influenza deaths.

Validity of Certification.

Table XCI shows, for every division of the International List of causes having 5 or more deaths, and for some of its subdivisions (each with 5 or more deaths), the extent to which the diagnosis had been confirmed by an autopsy, by a pathological or bacteriological examination after death without autopsy, or by other means such as an operation recorded on the death certificate. This table for 1933 may be compared with Table LXIX in the Review for 1928, bearing in mind the changes caused by revision of the International List in 1931. The tables do not include deaths certified after an inquest unaccompanied by an autopsy (such deaths being of course mainly from violent causes).

The form of medical certificate in use since 1927 requires statement for each death as to whether a *post mortem* examination has been made or not, and it also includes a blank form of notice by the

TABLE XCI.—Deaths from Causes confirmed by a pathological or bacteriological Post Mortem Examination or by operation mentioned on the Death Certificate per 1,000 Deaths ascribed to each Cause.—1933.

International List No.	Causes of Death.	Fe- Males.	Per- males.	Per- sons.	International List No.	Causes of Death.	Fe- Males.	Per- males.	Per- sons.
	ALL CAUSES	134	100	117	10	Diphtheria	45	63	54
1-44	I.—Infectious and Parasitic Diseases.	84	63	74	11	Influenza	37	34	35
1 & 2	Typhoid and paratyphoid fevers.	226	255	239	13	Dysentery	518	472	500
1	Typhoid fever	181	295	230	(a)	Amœbic	400	—	333
2	Paratyphoid fevers	474	100	282	(b)	Bacillary	586	333	500
5	Undulant fever	—	—	—	(c)	Other or unspecified	455	600	524
7	Measles	31	14	23	15	Erysipelas	99	49	76
8	Scarlet fever	74	69	71	16	Acute poliomyelitis	185	253	213
9	Whooping cough... ..	34	25	29	17	Encephalitis lethargica	100	83	92
					18	Cerebro-spinal fever	206	240	221
					22	Tetanus	263	214	250

Table XCI—continued.

International List No.	Causes of Death.	Fe- Males.	Per- males.	Per- sons.	International List No.	Causes of Death.	Fe- Males.	Per- males.	Per- sons.
136	Diseases of the urethra, urinary abscess, etc.	195	—	193	162	XVI.—Old Age ...	13	14	13
137	Diseases of the prostate...	255	—	—	163-198	XVII.—Deaths from Violence.	285	276	282
138	Diseases of the male genital organs.	429	—	—	163-171	Suicide ...	237	302	257
139	Diseases of the female genital organs	—	475	—	163	By solid or liquid poisons and corrosive substances.	519	428	480
	(a) Diseases of the ovary, Fallopian tube and parametrium.	—	463	—	164	By poisonous gas ...	262	259	261
	(b) Diseases of the uterus	—	495	—	165	By hanging or strangulation.	129	173	138
140-150	XI.—Diseases of Pregnancy, Childbirth, and the Puerperal State.	—	265	—	166	By drowning ...	200	231	211
140 & 145	Puerperal sepsis ...	—	321	—	167	By firearms ...	159	200	160
140	Post-abortion sepsis ...	—	525	—	168	By cutting or piercing instruments.	130	144	132
141	Abortion not returned as septic.	—	306	—	169	By jumping from high places.	422	500	452
142	Ectopic gestation ...	—	467	—	170	By crushing ...	193	409	229
143	Other accidents of pregnancy.	—	182	—	171	By other means ...	182	671	605
144	Puerperal hæmorrhage ...	—	141	—	172-175	Homicide ...	690	634	657
	(a) Placenta prævia ...	—	139	—	172	Infanticide (under 1 year).†	—	—	—
	(b) Other puerperal hæmorrhage.	—	144	—	173	By firearms ...	833	417	556
145	Puerperal sepsis not returned as post-abortion.	—	256	—	174	By cutting or piercing instruments.	600	565	579
146	Puerperal albuminuria and convulsions.	—	180	—	175	By other means ...	697	682	688
147	Other toxæmias of pregnancy.	—	371	—	176-194	Accidental deaths ...	287	241	272
148	Puerperal phlegmasia alba dolens, embolism and sudden death.	—	149	—	176	Attack by venomous animals.	240	211	227
149	Other accidents of childbirth.	—	254	—	177	Food poisoning... ..	833	167	611
150	Other or unspecified conditions of the puerperal state.	—	158	—	178	Accidental absorption of irrespirable or poisonous gas.	575	483	543
151-153	XII.—Diseases of the Skin and Cellular Tissue.	176	121	151	179	Other acute accidental poisoning (not by gas).	544	592	566
151	Carbuncle, Boil ...	157	165	160	180	Conflagration ...	300	125	239
152	Cellulitis, Acute abscess...	242	139	197	181	Accidental burns (conflagration excepted).	112	102	106
153	Other diseases of the skin and its annexa.	102	72	85	182	Accidental mechanical suffocation.	661	597	638
154-156	XIII.—Diseases of the Bones and Organs of Locomotion.	281	240	264	183	Accidental drowning ...	174	191	176
154	Acute infective osteomyelitis and periostitis.	348	303	330	184	Accidental injury by firearms.	224	—	214
155	Other diseases of the bones	174	132	157	185	Accidental injury by cutting or piercing instruments.	100	500	214
156	Diseases of the joints and other organs of locomotion.	236	213	226	186	Accidental injury by fall, crushing, etc.	282	233	266
157	XIV.—Congenital Malformations.	235	173	207	187	Cataclysm ...	—	—	—
158-161	XV.—Diseases of Early Infancy.	71	66	69	188	Injury by animals (poisoning by venomous animals excepted).	351	500	366
158	Congenital debility ...	68	66	67	189	Hunger or thirst ...	778	500	727
159	Premature birth ...	38	34	36	190	Excessive cold ...	200	143	189
160	Injury at birth ...	186	226	201	191	Excessive heat ...	204	189	199
161	Other diseases peculiar to early infancy.	178	169	174	192	Lightning ...	154	—	133
	(a) Atelectasis ...	187	161	177	193	Electricity (lightning excepted).	333	429	343
	(b) Icterus neonatorum	119	140	127	194	Other and unstated forms of accidental violence.	548	712	598
	(c) Other diseases included under 161.	203	200	202	195	(1) Inattention at birth	885	936	909
	(1) Diseases of the umbilicus.	419	346	391	195	Violent deaths of unstated nature (i.e., accidental, suicidal, etc.).	444	572	480
	(2) Pemphigus neonatorum.	—	—	—	196	Wounds of war ...	405	—	—
		—	—	—	198	Execution ...	444	—	—
199-200	XVIII.—Ill-defined Diseases.	75	55	66	199	Sudden death ...	98	35	71
199	Sudden death ...	98	35	71	200	Cause of death unstated or ill-defined.	67	61	64
200	Cause of death unstated or ill-defined.	67	61	64					

† Deaths from this cause are included under headings 173-175 (Homicide).

certifying practitioner that he may at a later date be in a position to afford information as to the cause of death additional to that in his certificate, thus providing for cases where the autopsy or other pathological examination was not complete at the time of framing the certificate. Diagnosis was thus stated or ascertained to have been confirmed after death or by operation in 11·7 per cent. of all deaths in 1933, 13·4 per cent. for males and 10·0 for females. The corresponding percentages in 1928 were 11·9 for persons, 13·2 for males and 10·6 for females.

The proportions vary greatly for different causes of death. Thus for the group of infectious and parasitic diseases the proportion per 1,000 deaths was 74, for cancer 150, aortic valve disease 195, coronary disease 274, fatty heart 414, peptic ulcer 433, appendicitis 456 and pericarditis 543. It must be remembered that no account is taken in these rates of confirmation of diagnosis during life by bacteriological, radiological or other means except by an operation so recent or important in its effects as to be mentioned on the death certificate. The more complete the confirmation during life becomes the smaller need there is for post mortem confirmation, and it follows that a decline of a rate in the table compared with 1928 may be the outcome of increasing resort to confirmatory methods of establishing the diagnosis before a fatal issue is reached. In other instances it may indicate a decreasing resort to operative measures.

Noteworthy decreases in the rates of Table XCI. compared with 1928 are evident for typhoid fever (314 to 230), diphtheria (88 to 54), cancer, diseases of the pancreas and spleen, appendicitis, intestinal obstruction and urinary calculi. The rate for all sites of cancer has declined from 170 to 150, for cancer of the breast from 269 to 183, cancer of the skin from 115 to 82 and cancer of the female genital organs from 153 to 124.

On the other hand considerable increases since 1928 in the proportions per 1,000 confirmed are evident for acute poliomyelitis, tuberculosis of the central nervous system and intestines, disseminated tuberculosis, syphilis (204 to 266), septicæmia, rheumatic fever, diseases of the mouth and pharynx, and of the respiratory system, cirrhosis and acute yellow atrophy of the liver and injury at birth.

Inquests and Uncertified Deaths in 1933.

The changes which have occurred since 1881 in the proportions of deaths certified in various ways or remaining uncertified are outlined in Table XCII. The quinquennial figures represent averages of the rates for individual years. There has been a significant increase since 1928 in the proportion of deaths certified by coroners after *post-mortem* examination without inquest, from 1·41 to 1·92 per cent. (6,496 deaths in 1928, 9,528 in 1933). A corresponding fall has occurred in the proportion of deaths registered after inquest, though the actual number of such deaths was almost

the same in 1933 (31,391) as in 1928 (31,220), an increase in the violent deaths being almost offset by a decrease in deaths from other causes. In London, deaths certified by coroners after *post mortem* have increased from 2,031* to 2,909, in the county boroughs from 1,996* to 2,811, in other urban districts from 1,663* to 2,736 and in rural districts from 797* to 1,072. London inquest deaths have fallen, however, from 4,208* to 3,540, whereas those in other urban areas have increased.

Table XCIII analyses the inquest deaths according to sex, age and the class of area in which the death was registered, and Table XCV similarly analyses the deaths certified by coroners without an inquest, these being comparable with Tables LXXI and LXXIII in the Review for 1928 though the classification of causes is of necessity somewhat different.

In England and Wales as a whole, inquest deaths from violence numbered 22,158, an increase of 1,093 over the corresponding group† in 1928, whilst inquest deaths from causes other than violence totalled 9,233, a decrease of 922. Deaths from non-violent causes certified by coroners after *post mortem* examination numbered 9,490, an increase of 3,020 over the corresponding total in 1928. The transfer here indicated of non-violent deaths from the "inquest" to the "no inquest" group was evidently most pronounced for deaths due to circulatory disease, but was also shared by the respiratory and infantile groups as may be seen by comparing the details of Table XCV with the corresponding table for 1928. The increase or decrease in the numbers of deaths certified in each year by coroners (a) after inquest and (b) after *post mortem* without inquest, and the proportions in groups (a) and (b) per 1,000 total deaths from the causes specified, were as follows:—

	Increase or decrease in No. of deaths in 1933 compared with 1928.		Proportions in (a) or (b) per 1,000 deaths from the causes specified.			
	(a)	(b)	1928.		1933.	
			(a)	(b)	(a)	(b)
All causes	+171	+3,032	68	14	63	19
Nervous diseases ..	-374	+20	28	14	21	16
Circulatory disease ..	-416	+1,703	34	32	24	38
Respiratory disease ..	-130	+417	18	15	16	24
Digestive disease ..	No change	+134	28	14	29	19
Puerperal state ..	+28	+31	70	24	88	39
Malformations; infantile disease‡ ..	-107	+82	19	12	15	17
All causes except violence‡	-922	+3,020	23	15	19	20

* Non-civilians are excluded from these totals for 1928.

† Including "lack of care," No. 163, with the violent deaths in 1928.

‡ Lack of care (No. 163 in 1928) is classed with the violent deaths.

The increase in deaths assigned to circulatory diseases after *post mortem* without inquest (from 3,330 in 1928 to 5,033 in 1933) is partly accounted for by the transfer due to dispensing with an inquest and partly reflects the general increase, amounting to about 25 per cent. in the five years, in all deaths attributed to these causes.

Table XCVI shows in detail for which causes of death coroners more frequently dispensed with inquests in 1933, and for which causes the holding of an inquest was the general rule. Of deaths from violence, 98 per cent. were certified after inquest, and other causes with high inquest rates are tetanus, septicæmia, diseases of the thymus, chronic poisoning, chronic interstitial pneumonia, abortion and acute osteomyelitis. An inquest was dispensed with for more than half of the deaths referred to the coroner and assigned to diphtheria, syphilis, diseases of the thymus, meningitis, cerebral hæmorrhage, pericarditis, valvular heart disease, fatty heart, angina pectoris, aneurysm, arteriosclerosis, pneumonia and congestion of the lung, peptic ulcer, diseases of the pancreas, chronic nephritis, atelectasis and icterus neonatorum.

Table XCII.—Certified and Uncertified Deaths and Inquest Cases, in 1881-1910 and in 1915, 1920, 1925, 1928 and 1933.

	Proportion per 100 Deaths.			
	Certified by:—			Uncertified Deaths.*
	Registered Medical Practitioners.	Coroners after Inquest.	Coroners after P.M.	
1881-85	90.86	5.38	—	3.76
1886-90	91.34	5.55	—	3.11
1891-95	91.58	5.86	—	2.56
1896-1900 ..	91.76	6.25	—	1.99
1901-05	91.56	6.73	—	1.71
1906-10	91.54	7.03	—	1.43
1915	91.67	6.96	—	1.37
1920	92.14	6.65	—	1.21
1925	92.08	6.91	—	1.01
1928	90.82	6.78	1.41	0.99
1933	90.81	6.32	1.92	0.95

Table XCIV analyses the uncertified deaths, and may be compared with Table LXXII in the Review for 1928. Most of the differences

* Deaths without certificate of registered medical practitioner in attendance (which since 1914 must be referred by Registrar to Coroner) where Coroner declined to hold inquest.

MEDICAL CERTIFICATION.

Under the title of "Medical Certification" a section has been included in each year's Statistical Review since 1928 inclusive, dealing with the extent to which the certification of a death by a medical practitioner is conditioned by the fact of his having seen the body of the deceased person either after death or within a reasonable period before the date of death. The circumstances under which it was arranged to include statistics on this subject were set out in the 1928 report, and figures for that year were given with a special degree of elaboration intended to serve as a datum line for comparison with any future occasion on which similarly full examination might be made. Since then, abridged summaries have appeared in each Statistical Review from 1929 to 1932, and on this, the sixth occasion the analysis has been extended to cover the fuller circumstances dealt with in the original reference of 1928.

It will be borne in mind throughout that the Regulations require a death to be reported to the Coroner if the medical attendant certifying the cause of death had seen the deceased neither after death nor within 14 days before death.

Table CI provides a comparative statement in regard to the immediate question upon which the figures are more specifically intended to bear, viz., the extent to which death registration and burial take place on the strength of the certificate of a medical attendant who has seen the body of the deceased after death. In any statistical analysis it is necessary for all practical purposes to group with such cases those where the death was the subject of a Coroner's inquest or post mortem examination, or came under review by a Coroner prior to registration and burial. These cases are, therefore, included under the head of "seen."

Table CI.—Summary of Certification of Deaths Registered, 1928 and 1933.

	Registered Medical Practitioner.		Inquest or Coroner's P.M. without Inquest.		Other Cases reviewed by Coroner.*		Total Deaths registered.			
	1928.	1933.	1928.	1933.	1928.	1933.	Number.		Percentage.	
							1928.	1933.	1928.	1933.
Seen after Death ..	183,062	211,062	37,716	40,919	13,984	14,716	234,762	266,697	51.0	53.7
Not seen after Death ..	223,519	228,839	—	—	—	—	223,519	228,839	48.5	46.1
No statement ..	2,108	929	—	—	—	—	2,108	929	0.5	0.2
Total ..	408,689	440,830	37,716	40,919	13,984	14,716	460,389	496,465	100.0	100.0

* Includes all deaths of inmates of Mental Hospitals not subject to Inquest or Coroner's P.M. (9,406 in 1928 and 9,988 in 1933), and also all deaths without certificate of registered medical practitioner in attendance (4,578 in 1928 and 4,728 in 1933) where coroner decided to hold no inquest or P.M.

It will be observed that in 1933 the proportion of "seen" cases was 53.7 per cent. of the total deaths registered as compared with 51.0 per cent. five years ago. The figures have been subject to slight irregularity over the intervening period, the percentages for 1929 to 1932 being 49.7, 52.0, 51.8 and 52.7 respectively, but on the whole the advance, if slow, has been in a favourable direction.

The improvement in the proportion of "seen" cases is, of course, complemented by a decline in the "not seen," which stood in 1933 at 46.1 per cent. of the total. But, as was explained in 1928, this apparently high percentage requires important qualification in view of the varying circumstances it embraces. In the following table the "not seen" cases are analysed according to the interval between death and the time last seen alive by the certifying medical practitioner.

Table CII.—"Not Seen" after Death—Interval between Death and Date when last seen alive—1928 and 1933.

	Percentage of Deaths "Not Seen."		Percentage of total Deaths.	
	1928.	1933.	1928.	1933.
Same day	44.1	45.4	21.4	21.0
1 day before	39.6	40.0	19.2	18.4
2 days before	8.0	7.6	3.9	3.5
3-6 days before ..	6.3	5.6	3.1	2.6
7 or more days before ..	2.0	1.4	0.9	0.6
Total seen after death or seen alive on same day as death			72.4	74.7
Total seen after death or seen alive within 1 day of death			91.6	93.1
Total seen after death or seen alive within 2 days of death			95.5	96.6

The distribution of the "not seen" according to the interval categories used in the table is very similar in the two years compared, but such change as is disclosed may be said to be favourable rather than otherwise, since the proportions at the shorter durations have increased, and those at the longer intervals declined. In 45.4 per cent. of the "not seen" cases of 1933 the deceased was actually seen on the very day of death, and in another 40.0 per cent. on the day before. Many of those seen on the day before death must, of course, have been seen within a few hours only of death since the day runs from midnight to midnight. It thus becomes clear that of the 228,839 deaths returned in Table CI as "not seen," in 85.4 per cent., or 195,410 cases, the deceased was seen alive by the medical

attendant on the day of death or the day before, and if these cases, representing 39·4 per cent. of the total deaths, are added to those seen after death, as conforming to a standard which satisfies reasonable requirements, the proportion of such cases is increased to 93·1 per cent. as compared with 91·6 per cent. in 1928. Further, if those seen alive within two days of death are added, the total is increased to 96·6 per cent. (95·5 in 1928).

A further circumstance which is of importance in the consideration of the 228,839 cases returned as "not seen" after death lies in the fact that a substantial portion, viz., 75,815, were in respect of deaths which occurred in hospitals and other residential institutions. Such grounds of dissatisfaction as may be felt in regard to the less satisfactory types of certification can hardly apply to the case of deaths under the care and organised attention which is afforded in the institutions in question. The statutory certificate of cause of death must be given by the practitioner in attendance upon the deceased during his last illness, and where in the course of institutional routine the deceased is seen after death by some other practitioner than the practitioner who attended him in life, the latter, who should normally give the certificate required, would be unable to certify that he had seen the deceased after death.

The following table compares the incidence of the "not sees" in institutions and in private practice :—

Table CIII.—Proportion of "Not Seens" (Coroners' Cases and "No Statement" cases excluded).

	Public Assistance Institutions.	Voluntary Hospitals.	Public Assistance Institutions and Voluntary Hospitals combined.	Private Practice.
	Per cent.	Per cent.	Per cent.	Per cent.
1928	63·6	30·2	49·3	57·3
1929	65·8	30·2	51·6	58·0
1930	65·2	29·7	50·0	56·0
1931	65·4	29·6	50·4	55·7
1932	65·2	29·8	50·4	54·6
1933	67·3	39·2	49·4	53·4

Beyond the fact that the proportions shown for Public Assistance Institutions have been about double those for Voluntary Hospitals over the whole period, and that the excess has tended to increase

rather than diminish, the 1933 record cannot properly be compared with those of preceding years owing to the fact that many infirmaries and other former Public Assistance Institutions which have been appropriated to Public Health Act or Maternity and Child Welfare purposes have now been transferred to the Voluntary Hospitals group. When the two categories are combined so as to eliminate the effect of transfers between them the institution proportion of "not sees," viz., 49·4 per cent. in 1933, is shown to be practically the same as it was in 1928, whereas the corresponding percentage assigned to private practice shows a fall from 57·3 to 53·4 during the same period.

When, however, the interval between death and the date last seen alive is taken into account, the differences suggested by the preceding table are considerably modified, as is shown by the following analysis :—

Table CIV.—Comparative Analysis of Proportions for Institutions and Private Practice of Cases "Seen" after Death and "Not Seen" after Death, but seen alive within Two Days of Date of Death (Coroners' Cases excluded), 1928 and 1933.

	Public Assistance Institutions.		Voluntary Hospitals.		Public Assistance Institutions and Voluntary Hospitals combined.		Private Practice.	
	1928.	1933.	1928.	1933.	1928.	1933.	1928.	1933.
Seen after Death ..	36·4	32·7	69·8	60·8	50·7	50·6	42·7	46·6
Seen alive on day of Death	33·6	34·0	17·6	22·9	26·8	26·9	23·1	21·9
Seen alive one day before Death	26·5	28·0	11·1	14·9	19·9	19·7	22·6	21·4
Total	96·5	94·7	98·5	98·6	97·4	97·2	88·4	89·9
Seen alive two days before Death	2·3	3·7	0·9	0·8	1·7	1·9	5·5	5·1
Total seen after Death or seen alive within two days of date of Death (though not seen after Death)	98·8	98·4	99·4	99·4	99·1	99·1	93·9	95·0

In respect of regional or district comparisons, the institution element is so frequently influenced by the practice of individual large institutions that local figures are of little relative value. The

records from private practice are free from this disability, and it is interesting to observe that the proportions of "seen" cases are highest in London, where they reach 69·5 per cent., and in neighbouring South Eastern Counties with percentages usually in excess of 60, whereas at the other extreme in the Northern Counties of Wales the figure falls below 30 per cent. With minor exceptions the local variations are much the same now as they were in 1928, though usually at an improved level, as is partially illustrated in the following table giving the proportions for certain Registration "Counties" (or aggregates of such "Counties") in which the percentage of "seen" in private practice is below 40. The figures are obtainable only by reference to existing registration units of area, and cannot, it is regretted, be given under present conditions for administrative areas.

Table CV.—Registration Sub-divisions in which the percentage of "Seen" Cases in Private Practice in 1933 was under 40.

Registration Sub-Division	Counties comprised in the Registration Sub-division.	Percentage of "Seen" cases.	
		1933.	1928.
XI b	Cardiganshire, Brecknockshire, Radnorshire, Montgomeryshire, Flintshire, Denbighshire, Merionethshire, Caernarvonshire and Anglesey	27·3	25·2
VI b	Staffordshire	29·7	28·2
VII a	Leicestershire, Rutlandshire and Lincolnshire	34·3	32·7
XI a	Monmouthshire, Glamorganshire, Carmarthenshire and Pembrokeshire	35·0	34·7
VII b	Nottinghamshire and Derbyshire	35·4	33·5
VI c	Worcestershire	35·5	32·1
VIII c	Lancashire (part of), viz.: Unions of Wigan, Warrington, Leigh, Bolton, Bury and Barton-upon-Irwell	36·1	35·0
X a	Durham	37·2	34·2
IX c	Yorkshire (part of), viz.: Unions of Wakefield, Pontefract, Hemsworth, Barnsley, Penistone, Wortley, Sheffield, Rotherham, Doncaster, Thorne, Goole, Selby and Tadcaster	37·7	33·3
IV b	Norfolk	38·7	34·5
III b	Northamptonshire, Huntingdonshire, Bedfordshire and Cambridgeshire	39·1	34·0

It will be observed from Table CI that the "No Statement" cases have diminished from 2,108 in 1928 to 929 in 1933, and now represent 2 per 1,000 of the total deaths registered. The decline in this unsatisfactory class has been progressive over practically the whole period, but its disappearance has not been quite so rapid or complete as had been originally anticipated. Nearly 60 per cent. of the current cases relate to institution deaths where their continued existence is of less significance in so far as they arise from the special circumstances attending institution certification which have already

been referred to, and it is more gratifying to note that the fall has been relatively greater amongst private practice certifications where the current 395 omissions are now but little more than 1 per 1,000 of the total deaths certified.

Table CVI.—Number of "Not Stated" Cases in Institutions and in Private Practice, 1928-1933.

Year.	Institutions.	Private Practice.	Total.
1928	1,091	1,017	2,108
1929	670	1,041	1,711
1930	692	645	1,337
1931	721	488	1,209
1932	390	218	608
1933	534	395	929

POPULATION.

The total population of England and Wales as at the 30th June, 1933, has been estimated at 40,350,000 persons, 19,357,000 being males and 20,993,000 females.

The current year's total is 149,000 in excess of the corresponding mid-1932 estimate and represents an estimated rate of growth of 0·37 per cent. per annum during the past year, a figure which may be compared with the 10-year increases of 5·53 per cent. and 4·93 per cent. recorded in respect of the decennia 1921-31 and 1911-21 respectively. (See General Tables Volume Census, 1931, Table I.)

The method adopted in arriving at the current estimates is that which has been used with apparent success in past periods and consists of taking the 1931 Census as a starting point, adding the births and immigrants and deducting deaths and emigrants between the date of the Census and the 30th June, 1933. Of the elements entering into the computation, the records of births and deaths are believed to be precise and complete, so that such estimation error as may be inherent in the final result may be regarded as attaching almost wholly to the allowances included in respect of migration. For the latter, recourse is had to the statistics of migration periodically compiled by the Board of Trade and to departmental records of the movements of the Defence Forces; these are incomplete however, in that they afford no guide to the passenger traffic between the several countries of the United Kingdom nor to the possible effect on the home population of changes in the personnel of the mercantile marine, the allowance for which is a matter of judgment based upon past experience qualified as may seem to be required by current conditions. The error to which the population estimates are subject is one which may be expected to grow in degree as the preceding census becomes more remote.

The mid-1933 population estimate of 40,350,000 is some 398,000 in excess of the 1931 census figure, of which excess about 264,000 may be assigned to natural increase, leaving 134,000 to be ascribed to the miscellaneous movements summed up in the term migration. It is of interest to observe (from Part II. of the Statistical Review Table S) that the net balance of migration which for several decades has, on the whole, been consistently outward in character, appears since about 1930, to have shown a definite inward tendency, thus affording some numerical compensation for the continued decline in the numbers of births.

Age Distribution.—The estimated sex-age distribution of the national population, shown in Table 1 of Part I of the Tables section of this volume, has been obtained from a revised 1932 distribution based on graduated census figures by the survivorship method customarily adopted for the purpose; this briefly consists of (1) obtaining the year's deaths arising from the population at each age in 1932, and treating the survivors as the population at the next higher age in 1933, (2) completing the table by the addition of the population aged 0-1, represented by the survivors at the middle of 1933 of the births occurring between the middle of 1932 and the middle of 1933, and (3) adjusting the results of these two operations in respect of the balance of population movement in accordance with such age statistics as are available in respect thereof.

The average ages of the mid-1933 population according to the estimated age distribution are 32·2 and 33·9 for males and females respectively, figures which compare with averages of 31·8 and 33·5 in 1931 or 29·9 and 31·2 in 1921.

Local Populations.—The 1933 estimates of the populations of all Boroughs, Urban Districts and Rural Districts in England and Wales are shown in Table 17 of Part I and Table E of Part II of the Tables section of the current Annual Review.

As for the country as a whole, so for each of the component areas within the country the present mid-year estimate has been obtained by estimating the local movement which has taken place since the date of the 1931 census and modifying the 1931 position in respect of such movement. It may be mentioned that the local estimates purport to represent the resident populations of the several areas and are, in this respect, different from census populations as generally understood in this country, which consist simply of the persons enumerated in the several areas on census night, whether resident in the area of enumeration or not.

The principles and procedure governing the identification of the basic 1931 resident population and the estimation of the changes in that population which have taken place since 1931 are similar in all general respects to those adopted for the purpose of the 1932 estimates and for their fuller discussion reference may be made to the population section of the text portion of the Annual Review for 1932.

Non-Civilian Populations.—The merging of non-civilian and civilian deaths in the local mortality records from 1932 onwards has rendered unnecessary the identification of civilian apart from total populations, and the former, shown prior to 1932 in footnotes to Tables 17 and E, are accordingly now omitted.

Institutions.—In the Census classification of population according to residence, the populations of institutions, *e.g.*, Public Assistance Institutions, Infirmaries, Hospitals, Mental Institutions, etc., were dispersed to their home areas where it was anticipated that they would be discharged within a period of six months; otherwise they were retained in the Institution area. This convention is reflected in the current population estimates but is not precisely identical with the procedure in the areal classification of deaths where it is customary to transfer all institution deaths to former area of residence (if known) irrespectively of the time spent in the Institution.

Local Age Distributions.—Sex and age distributions for large geographical regions of the country, which formerly appeared in the text portion of the Review, are now shown in Table 2 of Part I. The populations at ages under five were obtained by the survivorship method (*see* page 164), and for later ages the predetermined total populations, obtained as described in the preceding section, were distributed in accordance with the recent census age and sex distribution of the unit, the resulting figures being thereafter modified to allow for the slight change between the date of the Census and the middle of the year (1933) in the age distribution of the total population of the country.

United Kingdom and Irish Free State.—The populations of each of the countries of the United Kingdom and of the Irish Free State as estimated by their respective Registrars-General, are shown for each year from 1894 in Table A.

MARRIAGES

The marriages registered in England and Wales during the year 1933 numbered 318,191, corresponding to a rate of 15·8 persons married per 1,000 of the population of all ages and conditions. The number so registered is 11,007, or 3·58 per cent. more than the number registered in 1932, and apart from the year 1915 and the years immediately following the war, 1919-1921, is the largest number in any year since the commencement of civil registration in 1837. (*See* Tables B and C.)

The preference for the third quarter, noticeable in the records since the beginning of the present century, was maintained in 1933, the marriages in this period being 32·4 per cent. of the total, while the fourth, formerly the outstanding favourite, now ranks third out of the four. The rate for the first quarter, 8·9 persons

married per 1,000 population, was lower than in any first quarter since 1837, and the actual number of marriages, 44,298, lower than in any first quarter since 1901. The proportion of marriages contracted in the first quarter was only 13·9 per cent. of the total.

In the following table (CVII) the marriages of a series of years are compared with the unmarried population at all ages over 15. By eliminating the progressively falling proportion of children under 15 from the population at risk, the rates of recent years are scaled down slightly in relation to those of earlier periods, but the principal interest of the table is in showing the difference in the course of the rates as between the two sexes. The actual difference between the male and female ratios is of course due to the inequality of the numbers of unmarried men and women in the population, and since the former have always been in a minority—which has been unduly exaggerated as a result of the

Table CVII.—Annual Number of Marriages of Men and Women per 1,000 Unmarried Population of each Sex aged 15 and over, 1871–1933.

NOTE.—For the census years 1871 to 1931 the annual numbers of marriages have been taken as the average of the three years about each census. From 1920 the rates for individual years are shown.

Year.	Bachelors, Widowers, Spinsters and Widows.	Bachelors and Widowers.	Spinsters and Widows.
1871	57·2	62·3	52·9
1881	51·5	56·0	47·6
1891	49·8	54·6	45·7
1901	48·7	53·5	44·7
1911	46·3	50·8	42·5
1921	54·1	62·7	47·6
1931	46·7	53·3	41·5
1920	61·7	71·5	54·7
1921	52·1	60·4	45·8
1922	48·2	55·8	42·5
1923	46·6	53·9	41·1
1924	46·6	53·6	41·2
1925	46·2	53·3	40·9
1926	43·4	50·0	38·3
1927	47·5	54·8	41·9
1928	46·4	53·7	40·9
1929	47·7	55·2	41·9
1930	47·8	55·6	42·0
1931	46·8	53·4	41·6
1932	46·1	52·6	41·1
1933	48·1	54·9	42·8

war—it is their numbers which primarily determine the marriageability of the population, so that, from one point of view, the male ratios may be regarded as providing the better indexes to the variations which have occurred from time to time in the incidence of marriage. In Table C (Part II), the series is taken back to 1893.

Fluctuations of the general Marriage-rate in different Sections of the Country.—In Table CVIII comparison is made of the year's marriages and marriage-rates in large geographical sections of the country, and an analysis of the rates in regions and counties is shown in Table F.

The determination of marriage-rates for localities is not wholly satisfactory. In a large proportion of cases the district of registration is the district of residence of only one of the parties and in some cases of neither. This difficulty, however, is probably of less moment in comparisons between large sections of the country than between smaller areas.

Among males, the highest frequencies occur in North III and Midland II, which retain the position they held in 1932, but in reverse order. Among females the highest places are occupied by Wales I and North I. The lowest frequency, for both males and females, is recorded in Wales II.

From the analysis in Table F it will be seen that, among the counties there compared, the 1933 marriage-rate was highest in

Table CVIII.—Marriage-rate per 1,000 Unmarried Population aged 15 and over in Geographical Sections of the Country.*—1932 and 1933.

Area.	Ratio of un-married males per 1,000 un-married females aged 15 and over (Census 1931).	Rate per 1,000 Unmarried Population aged 15 and over.				Ratio of local rate to England and Wales rate (taken as 1,000).			
		1932.		1933.		1932.		1933.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
England and Wales.	778	52·6	41·1	54·9	42·8	1,000	1,000	1,000	1,000
South-East ..	711	53·7	38·3	56·3	40·2	1,021	932	1,026	939
North ..	796	52·8	42·2	55·1	44·0	1,004	1,027	1,004	1,028
North I ..	959	50·5	48·7	54·1	52·1	960	1,185	985	1,217
North II ..	866	47·1	40·9	48·1	41·9	895	995	876	979
North III ..	794	55·9	44·6	57·9	46·2	1,063	1,085	1,055	1,079
North IV ..	736	53·2	39·3	55·5	41·0	1,011	956	1,011	958
Midland ..	807	54·2	43·9	56·3	45·6	1,030	1,068	1,026	1,065
Midland I ..	797	53·3	42·7	55·9	44·7	1,013	1,039	1,018	1,044
Midland II ..	826	56·0	46·4	57·1	47·3	1,065	1,129	1,040	1,105
East ..	878	48·0	42·3	50·6	44·6	913	1,029	922	1,042
South-West ..	743	50·7	37·8	51·5	38·4	964	920	938	897
Wales ..	986	46·5	46·0	49·0	48·5	884	1,119	893	1,133
Wales I ..	1,060	48·4	51·6	51·5	54·9	920	1,256	938	1,283
Wales II ..	833	41·4	34·6	42·3	35·4	787	842	770	827

* For the constitution of the several sections, see page 6.

London, where it exceeded the mean for the country by 20·3 per cent. followed in order by Bedfordshire, Glamorganshire, Warwickshire and the West Riding of Yorkshire, with excesses ranging from 2·5 to 4·4 per cent. The lowest rates occur in Wales where the counties of Anglesey, Cardigan, Merioneth, Montgomery and Radnor all return lower rates than any among the English counties.

The City of London returns a rate nearly four-and-a-half times as high as the average, and of the Metropolitan Boroughs several have high rates, notably Holborn and Westminster, where rates more than twice the average are found. Such rates give support to the belief that many persons who usually live in the provinces or abroad come to London to be married. At the census of 1931 these three areas returned higher proportions of population living in hotels, boarding-houses, etc., than any of the other Metropolitan Boroughs. Only three of the Metropolitan Boroughs—Bethnal Green, Lewisham and Stoke Newington—have rates which are lower than the average for England and Wales. Among the county boroughs distinguished, the highest rates occur in Leicester, Reading and Brighton, and the lowest in Barrow-in-Furness and Canterbury.

Marriage rates by ages, which provide a more exact statement of the incidence and intensity of marriage than the aggregate rates just considered, are shown in Table CIX. The rates for 1871 to 1931, being based on enumerated populations, are liable to rather smaller errors than those for 1932 and 1933 which are based on post-censal estimates of population.

It will be observed from the last column of Table CIX, which compares the actual marriages of each year with a standard number, viz., those expected according to the age rates of 1921, and which makes allowance, therefore, for the changing age constitution of the unmarried population, that of the four sections distinguished, bachelors, widowers, spinsters and widows, the 1933 frequencies are all lower than those of 1921, the percentages to the 1921 frequencies being, in order, spinsters 99·6, widowers 84·8, bachelors 82·9, and widows 70·5. On this basis of comparison the marriage frequency among bachelors is higher than in 1901 but lower than in previous years; that for widowers lies between the ratios of 1901 and 1911; that for spinsters lies between the ratios of 1881 and 1891; while that for widows differs only slightly from the ratio of 1932, and is much lower than any previously recorded for this class in the table.

From the age analysis shown in the earlier columns of Table CIX, it will be seen that the 1933 rates for all four sections have decreased as compared with those for 1921 in all age-groups from 20 to 55 (except for spinsters, aged 25–35), and that the decrease among bachelors, widowers and widows is continued into the final group, age 55 and over. The only noteworthy increase occurs among spinsters under 20 years of age. The maintenance of

the marriage-rate of young spinsters at a point well in excess of the corresponding rates of pre-war years has been a feature of the returns of recent years. With both bachelors and spinsters, the

Table CIX. — Annual Marriage-rate per 1,000 Bachelors, Widowers, Spinsters and Widows respectively at each of several Age Periods, 1871–1933.

NOTE.—Prior to 1921 the annual numbers of marriages have been taken as the average of the three years about each Census.

Year.	Annual marriage-rate per 1,000 in each age group.						Marriage-rate per 1,000 population over 15 in each class.	Ratio to corresponding rate for 1921.	Marriage-rate which would have resulted had the 1921 age rates been in operation.	Ratio of actual marriage rate (Col. 8) to rate in previous column (10).
	15—	20—	25—	35—	45—	55 and over.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
BACHELORS.										
1871 ..	6·0	122·4	119·3	43·3	15·3	3·2	61·7	987	62·3	990
1881 ..	4·6	106·8	112·4	40·5	14·3	3·0	55·7	881	62·4	893
1891 ..	3·1	94·7	122·4	43·4	15·2	3·5	54·8	877	63·8	859
1901 ..	2·5	85·9	123·7	44·2	14·6	3·3	54·7	875	66·6	821
1911 ..	2·2	74·8	120·6	44·4	14·9	3·9	52·6	842	69·2	760
1921 ..	3·4	94·4	181·1	61·6	19·7	5·5	62·5	1,000	62·5	1,000
1931 ..	3·3	72·3	140·3	32·7	18·1	5·7	56·2	899	67·7	830
1932 ..	3·4	69·7	136·9	51·1	16·9	5·2	55·5	888	68·7	808
1933 ..	3·4	70·4	142·2	51·3	18·3	5·4	58·2	931	70·2	829
WIDOWERS.										
1871 ..	11·5	229·0	288·5	181·5	88·3	15·9	65·8	1,475	56·0	1,175
1881 ..	30·6	192·9	246·5	157·8	76·9	16·0	58·2	1,305	56·0	1,039
1891 ..	14·1	153·4	231·7	151·1	74·7	15·5	53·4	1,197	53·7	994
1901 ..	—	132·6	201·7	134·1	65·3	13·5	44·4	996	51·0	871
1911 ..	—	121·6	171·2	117·9	59·4	12·7	36·9	827	47·4	778
1921 ..	14·3	163·7	229·3	153·2	73·5	15·8	44·6	1,000	44·6	1,000
1931 ..	62·5	98·1	179·8	122·3	65·4	14·8	33·1	742	38·5	860
1932 ..	—	103·9	177·6	124·3	62·7	14·0	31·8	713	38·1	835
1933 ..	—	95·3	177·2	125·6	64·9	14·2	31·9	715	37·6	848
SPINSTERS.										
1871 ..	26·8	133·7	85·9	30·4	11·9	1·7	63·1	1,164	55·8	1,131
1881 ..	21·5	121·9	80·6	26·3	10·4	1·6	56·9	1,050	55·8	1,020
1891 ..	16·2	112·4	85·7	26·4	10·3	1·7	54·4	1,004	57·1	953
1901 ..	12·9	104·9	88·6	25·3	9·1	1·5	53·0	978	58·6	904
1911 ..	11·2	97·7	91·1	24·4	8·5	1·8	50·6	934	58·0	872
1921 ..	14·8	114·4	100·0	25·6	8·9	2·0	54·2	1,000	54·2	1,000
1931 ..	17·1	106·9	97·2	22·3	8·3	2·2	51·9	958	53·9	983
1932 ..	17·7	105·1	96·4	22·1	7·8	2·1	51·6	952	54·1	954
1933 ..	18·7	109·2	101·2	22·5	8·1	2·3	54·3	1,002	54·5	996
WIDOWS.										
1871 ..	55·4	170·5	125·5	55·7	20·8	2·6	21·1	1,172	19·6	1,077
1881 ..	56·6	155·3	114·5	50·2	18·6	2·6	18·2	1,011	18·5	984
1891 ..	49·3	150·4	114·3	50·3	17·8	2·4	16·3	906	16·8	970
1901 ..	54·9	140·7	115·9	48·9	15·6	2·1	14·4	800	15·6	923
1911 ..	30·0	151·2	114·1	48·9	15·6	2·1	12·5	694	13·6	919
1921 ..	36·1	191·4	120·3	50·6	17·6	2·5	18·0	1,000	18·0	1,000
1931 ..	57·1	140·8	93·0	33·2	13·6	2·2	8·7	483	11·7	744
1932 ..	14·3	153·2	84·8	31·9	12·3	2·1	8·0	444	11·4	702
1933 ..	45·5	137·7	87·0	32·2	12·2	2·1	7·9	439	11·2	705

rates for the age period 25-35, at which practically one-half and one-third respectively of the marriages of these classes take place, are higher than those of any pre-war year shown in the table, while for bachelors the excess extends to all higher ages. For both classes the rates show an increase over those of 1932 at all ages except for bachelors under 20 at which 3.4 is shown for both years.

Widowers' and widows' rates as compared with 1921 show a consistent fall in all the age divisions identified except widows at 15-20 where the numbers are insignificant. Widowers' rates are largely in excess of the corresponding bachelors' rates, except under 20 years of age, so that it may be said that re-marriages in the case of males are relatively more frequent than first marriages. As compared with 1932, most of the rates are slightly higher, the chief exception being at ages 20-25 where rather substantial decreases occur, but having regard to the small numbers of marriages among those classes at 20-25, the decreases are probably of little significance.

Comparison of the rates for spinsters and widows shows that the latter have the advantage in all age groups except at 25-35 and 55 and over. The age analysis serves to call attention to the misleading nature of the comparison suggested by the aggregate marriages per 1,000 population shown in column 8 of Table CIX; owing to the concentration of the single population at the younger ages where marriages are numerous, and the widowed population at the later ages where they are few, the aggregate rate for the single of each sex appears to be vastly in excess of that of the widowed, whereas, if allowance be made for the difference in their age constitutions, the relative positions are modified and, for all age-groups among males and nearly all age-groups among females, are in favour of the widowed.

Table CX shows how the proportions of first marriages and re-marriages have varied from 1918 to 1933. In 1933 there was a higher proportion of first marriages, and consequently, a lower proportion of re-marriages, than in any of the previous years. This trend is observable for both sexes, and especially for women, since 1919.

Tables L and K, which now appear in Part II of this Review, continue the series shown in previous issues of the Text Volume (Tables LXXXVI and LXXXVII in the volume for 1930). They classify by age the marriages of a number of years, the former giving the mean ages of the persons married in each of the possible combinations and the latter extending the analysis into a number of age-groups. Table K shows that, during the last 45 years or so, the modal age of marriage has tended to increase steadily. In each of the four sections the proportion marrying under 21 years of age has decreased. For bachelors, the most popular age has passed from 21-25 to 25-30, and for widowers, from 35-40 to 50-55; while for spinsters and widows, although the modal group has not changed

—being throughout 21-25 for the former and 35-40 for the latter—the position of the mode has risen within the group. The distribution for 1933 as shown in Table K, and the average ages shown in Table L fluctuate in no significant way from the data of the previous few years.

Table CX.—Proportions of First Marriages and Re-marriages in 1,000 Marriages, 1918-1933.

Year.	Men.		Women.		Bachelors who married.		Widowers who married.	
	Bachelors.	Widowers.	Spinsters.	Widows.	Spinsters.	Widows.	Spinsters.	Widows.
1918	901	99	894	106	837	64	57	42
1919	897	103	875	125	816	81	59	44
1920	907	93	894	106	839	68	55	38
1921	911	89	909	91	855	56	54	35
1922	913	87	920	80	866	47	54	33
1923	915	85	929	71	875	40	54	31
1924	916	84	932	68	880	36	53	31
1925	916	84	937	63	884	32	53	31
1926	917	83	940	60	887	30	53	30
1927	918	82	942	58	890	28	52	30
1928	921	79	943	57	893	28	50	29
1929	920	80	946	54	894	26	51	29
1930	923	77	949	51	897	25	51	27
1931	924	76	950	50	900	24	50	26
1932	925	75	953	47	903	22	50	25
1933	926	74	954	46	904	22	50	24

Table G (Part II, p. 61) shows that more men married at age 25 and more women at age 23 than at any other age. Table J (Part II, p. 63) shows the ages of husbands and wives in combination. Among those under 25, for whom the data are given by single years of age, there is a tendency for brides to be about a year younger than bridegrooms.

Marriages of Minors.—Of the males married during the year, 12,981, or 4.08 per cent., were under the age of 21, and of the females 50,227, or 15.79 per cent., as compared with 4.36 per cent., and 16.04 per cent. last year respectively (*see* Tables M and CXI). The male rate is lower than any recorded since 1925. Females, who have always greatly outnumbered the males in this class—in the present year the ratio is nearly 4 to 1—naturally show the highest rates and the greatest changes in the rate; they formed 18.8 per 1,000 of the unmarried and widowed

Table CXI.—Minors Married per 1,000 Marriages at all Ages, 1876-1933.

Year.	Husbands.	Wives.	Year.	Husbands.	Wives.
1876-80 ..	77.8	217.0	1920 ..	46.8	142.9
1881-85 ..	73.0	215.0	1921 ..	48.2	149.2
1886-90 ..	63.2	200.2	1922 ..	44.4	144.4
1891-95 ..	56.2	182.6	1923 ..	42.5	142.9
1896-1900 ..	51.2	168.0	1924 ..	40.4	140.3
1901-05 ..	46.3	153.1	1925 ..	40.6	142.3
1906-10 ..	40.3	139.4	1926 ..	43.3	147.5
1911-15 ..	39.2	136.6	1927 ..	41.4	146.1
1916-20 ..	42.6	133.3	1928 ..	43.5	151.5
1921-25 ..	43.3	143.9	1929 ..	41.8	151.7
1926-30 ..	42.5	150.5	1930 ..	42.6	155.3
1917 ..	41.7	134.2	1931 ..	43.5	158.5
1918 ..	42.6	129.0	1932 ..	43.6	160.4
1919 ..	43.7	129.4	1933 ..	40.8	157.9

females aged 15-21 in 1911, were 26.6 in 1920, and are now 27.1, while the corresponding rates for males were 5.5, 8.8 and 6.8 per 1,000 respectively (see Table CXII).

Comparative figures are shown in Table CXII for certain years back to 1901, before which the age-group 15-21 was not identified in the population returns; an indication of the trend of youthful marriage-rates in earlier periods may be gained from Table CXI.

Table CXII.—Annual Marriage-rate per 1,000 Unmarried and Widowed Persons in the age-group 15-21 in 1901, 1911, 1921, 1931 and 1927-33.

Year.	Males.		Females.	
	Rate.	Ratio to 1921. Per Cent.	Rate.	Ratio to 1921. Per Cent.
1901	6.7	87	21.6	92
1911	5.5	71	18.8	80
1921	7.7	100	23.4	100
1931	6.7	87	24.8	106
1927	6.0	78	21.6	92
1928	6.2	81	22.1	94
1929	6.2	81	23.0	98
1930	6.4	83	24.0	103
1931	6.7	87	24.8	106
1932	6.8	88	25.4	109
1933	6.8	88	27.1	116

The proportions of males and females marrying under age are summarised for regions in Table CXIII, and the numbers are stated in Table M. Much of the variation there shown is but a reflex of the incidence of the general marriage-rate (Table CVIII), and regard must necessarily be had to the latter in considering how far the former provides evidence of local custom regarding early marriage. In 1933 the three areas in which the proportion of male minors marrying was highest were, in order, North III, Wales I and Midland II. For females, the corresponding areas were Wales I, North I, and North II.

Table CXIII.—Marriage-rate of Minors per 1,000 Unmarried Population aged 15-21 in Geographical Sections of the Country, 1932 and 1933.

Area.	1932.				1933.			
	Rate per 1,000 Unmarried Population 15-21.		Ratio of local rate to England and Wales rate taken as 1,000.		Rate per 1,000 Unmarried Population 15-21.		Ratio of local rate to England and Wales rate taken as 1,000.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
England and Wales.	6.8	25.4	1,000	1,000	6.8	27.1	1,000	1,000
South-East	5.9	22.4	868	882	5.7	23.9	838	882
North	7.7	27.3	1,132	1,075	7.8	28.8	1,147	1,063
North I ..	7.8	34.5	1,147	1,358	7.1	36.7	1,044	1,354
North II ..	7.5	29.7	1,103	1,169	7.8	31.7	1,147	1,170
North III ..	8.0	28.7	1,176	1,130	8.4	29.8	1,235	1,100
North IV ..	7.5	23.5	1,103	925	7.8	25.1	1,147	926
Midland	7.0	25.2	1,029	992	7.4	27.0	1,088	996
Midland I ..	6.4	23.5	941	925	7.1	25.8	1,044	952
Midland II ..	8.0	28.3	1,176	1,114	7.9	29.3	1,162	1,081
East	6.8	28.6	1,000	1,126	6.8	31.4	1,000	1,159
South-West ..	6.0	25.7	882	1,012	5.6	25.9	824	956
Wales	6.5	31.3	956	1,232	7.1	34.4	1,044	1,269
Wales I ..	7.6	34.7	1,118	1,366	8.0	38.6	1,176	1,424
Wales II ..	3.3	21.8	485	858	4.3	22.5	632	830

Divorces and Remarriages of Divorced Persons.—The annual numbers of marriages dissolved or annulled are shown in Table O and again in Table CXIV in terms of the persons involved, for each of the past thirteen years and for each quinquennium back to 1876-80.

During the year 1933, 3,934 divorces and 108 annulments were obtained, the number of persons involved being twice these figures, or a total of 4,042 of each sex.

The number of divorces is higher than that recorded in any previous year—though only slightly greater than the earlier record of 1928—and is more than four times as great as in 1916.

From Table CXIV it will be seen that the number of persons who on remarriage described themselves as divorced shows an increase and is greater than the corresponding figure recorded for any earlier year. The regularity and continuity of the analysis generally confirms the incidence of remarriage tendencies in this class, but it should be borne in mind that the numbers may understate the facts owing to misdescription of status in the registers.

The reduction in the number of divorced men and women intermarrying, after a long series of almost continuous increases, is a noteworthy feature.

Table CXIV.—Annual Number of Persons Divorced, and of Divorced Persons who Remarried, 1876–1933.

Period.	Number of Persons Divorced.	Annual Number of Divorced Persons who remarried.							
		Total.	Men.	Women.	Divorced men marrying spinsters.	Divorced men marrying widows.	Divorced men and women intermarrying.	Divorced women marrying bachelors.	Divorced women marrying widowers.
1876–80 ..	554	104	56	48	42	12	4	31	15
1881–85 ..	671	128	68	60	53	12	6	42	15
1886–90 ..	707	169	80	89	65	11	8	65	20
1891–95 ..	744	214	110	104	89	15	12	75	23
1896–1900 ..	980	345	172	173	138	24	20	126	37
1901–05 ..	1,126	509	262	247	205	38	38	181	47
1906–10 ..	1,247	693	356	337	276	53	54	253	57
1911–15 ..	1,312	820	411	409	330	50	62	309	69
1916–20 ..	3,115	1,264	683	581	525	127	62	439	111
1921–25 ..	5,467	3,050	1,708	1,342	1,316	295	194	976	269
1926–30 ..	6,716	3,917	2,128	1,789	1,662	270	392	1,225	368
1921.. ..	7,044	2,878	1,592	1,286	1,182	330	160	939	267
1922.. ..	5,176	3,374	1,913	1,461	1,457	360	192	1,062	303
1923.. ..	5,334	3,008	1,679	1,329	1,307	279	186	1,002	234
1924.. ..	4,572	2,903	1,627	1,276	1,267	275	170	931	260
1925.. ..	5,210	3,088	1,729	1,359	1,367	229	266	944	282
1926.. ..	5,244	3,124	1,710	1,414	1,325	231	308	995	265
1927.. ..	6,380	3,576	1,924	1,652	1,509	244	342	1,133	348
1928.. ..	8,036	4,125	2,268	1,857	1,764	302	404	1,299	356
1929.. ..	6,792	4,427	2,408	2,019	1,886	307	430	1,357	447
1930.. ..	7,126	4,331	2,330	2,001	1,826	267	474	1,342	422
1931.. ..	7,528	4,668	2,517	2,151	1,963	299	510	1,456	440
1932.. ..	7,788	4,824	2,537	2,287	2,011	259	534	1,539	481
1933.. ..	8,084	5,068	2,747	2,321	2,135	318	294	1,571	456

In Table P are given certain particulars concerning the marriages in respect of which suits for dissolution or annulment were commenced during the year. 3,723 petitions were filed at the Principal Registry in London and 1,072 at 38 District Registries. In respect of the petitions filed at the Principal Registry in London it will be seen that the most frequent duration of marriage at the date of the commencement of the proceedings is from 5–10 years with an average of 223 for each of those years of duration, but the maximum is not of particular significance, for this period only accounts for 30 per cent. of the cases, there being 17 per cent. of shorter duration, while in 53 per cent. the marriages have subsisted

for 10 years or more. Forty-one per cent. of the marriages in question were childless, and in a further 31 per cent. there was one child only. These figures are substantially similar to those recorded in 1931 and 1932.

Buildings in which Marriages may be Solemnized.—At the end of the year 1933 the numbers of churches or chapels of the Established Church and of the Church in Wales and of registered buildings in which marriages could be legally solemnized, were as follows:—

		Increase per cent. since 1921.
Established Church and Church in Wales	16,472	2.0
All other religious denominations ..	20,706	14.4
Total	37,178	8.5

The increase upon the numbers at the end of the previous year was:—Established Church and Church in Wales 27, other religious

Table CXV.

Denomination.	Buildings certified to the Registrar-General as meeting-places for Religious Worship.	Buildings registered for the Solemnization of Marriages.*	Increase or decrease (–) per cent. since 1921 in the number of buildings certified for Religious Worship.
Roman Catholics	1,929	1,788	23.7
Methodist Church †	14,165	8,609	1.4
Congregationalists	3,499	3,226	4.0
Baptists	3,384	3,051	6.1
Calvinistic Methodists	1,384	1,097	6.5
Presbyterians	469	461	4.7
Unitarians	185	198	0.5
New Church	60	63	9.1
Catholic Apostolic Church	62	50	–11.4
Countess of Huntingdon's Connexion	45	40	–4.3
Salvation Army	1,434	338	26.2
Society of Friends	421	†	–2.3
Jews	307	†	18.5
Other Denominations	5,039	1,785	51.1
All Denominations	32,383	20,706	10.4

* Of these buildings nearly 1,000 were certified before 1852, as Places of Meeting for Religious Worship, to some other authority than the Registrar-General and therefore are not included in the preceding column.

† It is not necessary for buildings to be registered for the solemnization of Quaker or Jewish marriages. Under section 31 of the Births, Deaths, and Marriages Registration Act (1836), Registering Officers of the Society of Friends and Secretaries of Jewish Synagogues who have been certified to the Registrar-General record the marriages in each case.

‡ Includes Wesleyan Methodist, Primitive Methodist and United Methodist Churches.

denominations 220. The number of these buildings belonging to the various denominations is shown for the several geographical regions in Table N.

By the Acts 15 and 16 Vict. c. 36, and 18 and 19 Vict. c. 81, it was enacted that all places of religious worship not being churches or chapels of the Established Church, should, if the congregations desired, be certified as such to the Registrar-General, certification for public religious worship being a necessary preliminary to the registration of a building for the solemnization of marriages.

The number of places of meeting for religious worship on the official register on the 31st December, 1933, and the number of buildings registered for the solemnization of marriages are shown in Table CXV.

The Marriage Act, 1898, provided that under specified conditions marriages might be solemnized in registered buildings in the presence of duly authorised persons without the attendance of a Registrar of Marriages. The governing bodies of some of the registered buildings have availed themselves of this provision, and at the end of the year 1933, the number of such buildings which had been brought under the operation of the Act, and so remained, was 6,593 out of the total of 20,706. The numbers of these buildings, and the denominations to which they belonged, were as follows:—

4,333	Methodist Church.
948	Congregationalists.
683	Baptists.
160	Calvinistic Methodists.
469	Other Denominations and Unsectarian.
<hr/>	
6,593	All Denominations.

LIVE BIRTHS.

The live births registered during 1933 numbered 580,413, corresponding to a birth-rate of 14·4 per 1,000 of the population living. (Tables B and C.)

The number of births is 33,559 less than those of 1932, a decrease of 5·47 per cent.

The current rate of 14·4 per 1,000 is the lowest so far attained in the records of this country. The recent fall in the rate had been showing signs of diminution in immediately preceding years, and it might have been inferred from the rates for 1929 and 1930—16·3 in both—that the particular phase of movement associated with post-war adjustments was drawing to a close. The 1931 returns, however, showed a further decline to 15·8, and this was followed by 15·3 in 1932 and 14·4 in 1933. As explained on page 189, the present rate of recruitment is well below that which is necessary if a diminution of the total population is to be avoided in the future.

The birth-rate in this country attained its highest values since the commencement of civil registration during the period 1865-1880, when it exceeded 35 per 1,000 population, and from that time it diminished by gradual and practically continuous stages to 23·8 in 1914; the present rate of 14·4 per 1,000 is considerably less than half the maximum figure of 36·3 recorded in 1876.

The recent history of the birth-rate in this country may be compared with those of other countries of which particulars are at hand by reference to Table Q. The record extends over the period from 1911 to 1933 (for earlier years, see the Registrar-General's Annual Report for 1910) and covers therefore not only the years of the war period itself when the movements were quite abnormal, but a number of earlier and later years. Of the countries for which 1933 returns are available, only one—the Irish Free State—records increase in its birth-rate as compared with 1932, while the remaining 23 show decreases. Two only of these countries, Austria (14·3 per 1,000 population) and Sweden (13·7) have lower rates than that of England and Wales (14·4). In view of the experience recorded in this table, it is clear that tendencies cannot be discerned from the past year's movements that might herald any change of direction in the falling trends noted for most countries in the past decade.

In all the countries listed except France, Spain, Portugal, and Japan the recent rates show a large fall in comparison with pre-war experience, a fall which in respect of England and Wales is the more serious since the position of this country in relation to that of others was already a low one before the war. The case of France is somewhat exceptional in that the current rate is not much lower than it was before the war, so that instead of being outstandingly the lowest in the series as formerly, it now ranks above England and Wales, Austria, Germany, Norway and Sweden, and is equal to that of Belgium.

The crude birth-rate, or ratio of births to population of all ages, is a convenient form of statement when the object in view is to record the aggregate effect of all the various factors governing reproduction. It sums up the effects of all the influences governing the rate at which the community is reproducing itself and is, therefore, in conjunction with the corresponding form of mortality statement, the crude death-rate, the appropriate means of measuring natural increase. The number of births in the country, however, depends mainly upon the number of married women at the reproductive ages, and as they form less than one-eighth of the total population the variation of their numbers and ages over a period of time may be different from that of the whole population, in which case the crude birth-rates form but an imperfect measure of the changes in fertility, *i.e.*, of the rate of reproduction in proportion to the opportunity of reproduction. In the absence

of any knowledge of the constitution of the general population the crude rate is often used as an index of fertility, but always on the implied assumption of a fixed proportion of potential mothers, an assumption which may reasonably be made only in respect of short periods of adjacent years.

In order to exclude the effect of changing age-constitution of the population, and so obtain a better statement of variations of fertility, a method of standardization was introduced in the Statistical Review (Text) for 1922, and has been in use since then. A description of the method, together with a series of fertility rates calculated for England and Wales in 1921 and 1931 were given in the Registrar-General's Statistical Review for 1932 (Text, pp. 135, 136).

Summarized comparisons based on these fertility rates are given in the last column of Table CXVI for groups of three years about each census from 1871 to 1931, and for the individual years 1931 to 1933. The results are contrasted in that table with the more familiar comparisons given by the crude birth-rates whether calculated per 1,000 total population or per 1,000 married women between ages 15 and 45. Thus, in 1870-72, 2,148 legitimate births were recorded for every 1,000 that would have occurred under the standard fertility rates, the 1931 experience being in the aggregate less than half of that of 60 years before. From 1871 the rates diminished steadily and progressively to 1,592 in 1910-12. Since 1920-22 the even more rapid drop, commented upon in dealing with the crude rates, is shown by the further reductions in the index, from 1,460 to 1,000 in 1931. It will be observed that over the earlier years shown in the table the decrease in fertility was overstated by the crude rates, and that since 1920-22 the tendency has been in the other direction.

Illegitimate Births.—The live births registered during 1933 include 25,408 of illegitimate children, a decrease of 1,603 on the number in 1932, coincident with the decrease of 33,559 in total births. Illegitimate births have thus decreased by 5.9 per cent., and legitimate births by 5.4 per cent. As a result of these changes, the proportion of illegitimate to total births has fallen from 4.40 per cent. last year to 4.38 per cent., figures which compare with the minimum of 3.95 per cent. recorded for the period 1901-1905 and the maximum of 6.26 per cent. attained in 1918.

In addition to the crude rate comparison, an attempt has been made in Table CXVI to allow for the age distribution of the potential mothers in respect of illegitimate as well as legitimate births in the manner described above. In using the rates for illegitimate fertility, it must be remembered that they are of much less authority than the rates for legitimate fertility.

Seasonal Distribution of Births.—The number of births registered in each quarter of the year and their frequency per 1,000 population are shown in Table D. Since 1923 the highest rate has occurred in

every case in the second quarter. This contrasts with the experience of 1841 to 1890 when the highest rates usually occurred in the first quarter. The lowest rate is recorded consistently in the fourth quarter.

Table CXVI.—Birth-rates and Fertility, 1871-1933.

	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 Married Women, 15-45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
Legitimate Live Births.					
1870-72	33.3	2,205	292.5	2,380	2,148
1880-82	32.3	2,139	286.0	2,327	2,117
1890-92	29.4	1,947	263.8	2,146	1,983
1900-02	27.5	1,821	235.5	1,916	1,797
1910-12	23.4	1,550	197.4	1,806	1,592
1920-22	21.7	1,437	178.9	1,456	1,460
1930-32	15.1	1,000	122.4	996	999
1931	15.1	1,000	122.7	1,000	1,000
1932	14.6	967	118.0	962	964
1933	13.8	914	110.4	900	905
	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 Unmarried Women, 15-45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
Illegitimate Live Births.					
1870-72	1.96	2,800	17.0	2,982	2,886
1880-82	1.65	2,357	14.1	2,474	2,375
1890-92	1.31	1,871	10.5	1,842	1,755
1900-02	1.12	1,600	8.5	1,491	1,419
1910-12	1.03	1,471	7.9	1,386	1,363
1920-22	1.04	1,486	8.1	1,421	1,430
1930-32	0.71	1,014	5.8	1,018	1,002
1931	0.70	1,000	5.7	1,000	1,000
1932	0.67	957	5.6	982	974
1933	0.63	900	5.4	947	936
	Births per 1,000 Total Population.	Ratio to 1931.	Births per 1,000 total Women, 15-45.	Ratio to 1931.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
All Live Births.					
1870-72	35.3	2,234	153.7	2,387	2,179
1880-82	34.0	2,152	147.7	2,293	2,128
1890-92	30.7	1,943	129.7	2,014	1,972
1900-02	28.6	1,810	114.8	1,783	1,775
1910-12	24.5	1,551	98.3	1,526	1,581
1920-22	22.8	1,443	91.1	1,415	1,459
1930-32	15.8	1,000	64.3	998	1,000
1931	15.8	1,000	64.4	1,000	1,000
1932	15.3	968	62.6	972	964
1933	14.4	911	59.4	922	906

The seasonal distribution of births is thus consistent with the seasonal distribution of marriages, the frequency of which, as has already been noted (p. 165) is a maximum in the third and a minimum in the first quarter.

The degree of association between the frequency of marriages and that of births some nine to twelve months afterwards tends to increase with the progressive reduction in the size of families, and the consequent increase in the proportion of first-born children in the total.

Birth-rates of Different Parts of the Country.—The birth-rates, total and illegitimate, of individual administrative areas tabulated in Table E are summarized in Table CXVII for the geographical regions, and their sub-divisions.

The method for comparing the fertility of England and Wales in different years by the use of standard fertility rates applies equally well to the comparison of fertility in different sections of the population of which the sex, age and marital condition constitution is known, and the crude rate comparisons are supplemented in this table by the addition of a series of figures in which variations in birth-rates due solely to differences in the age and marital condition proportions of the several populations, as far as possible, have been eliminated.

Table CXVII shows for each of the specified divisions of the country the crude birth-rates of 1932 and 1933, the ratio of the crude rate to that of the country as a whole, and the corresponding ratio obtained by the use of the standard fertility rates of 1931.

The birth changes which have occurred between 1932 and 1933 in the geographical regions and types of area shown in the table are in general consonance with the movement in the country as a whole. Comparison of the 1933 crude rates for the several areas shows that the highest for all births are found in North I and II, and the lowest in the South-West and in Greater London. Crude rates for illegitimate births are highest in Wales II and North II, and lowest in Midland I.

The ratios shown in column (2) are based upon the crude rates and reflect therefore not only differences of fertility but also the varying incidence of sex, age and marital condition in the populations from which they arise. When the latter factors are eliminated as in column (4) of Table CXVII, the process may result in altering materially the relative position of an area; for instance, the ratio for Wales II rises from 993 (crude) to 1,210 (standardized) while Midland II falls from 1,007 to 954. If the areas be examined from the point of view of urbanization the change from the crude to the standardized comparison is also notable. By the crude rates the position of rural areas is distinctly understated, since from the point of view of fertility alone they are shown to be the most productive of all areas, and as compared with 1932 show an increase in relation to urban areas.

The extent of illegitimacy in different classes of area and parts of the country may be gathered from the right half of Table CXVII. Except for a wider range of variation generally the

Table CXVII.—Birth-rates by Geographical Regions, 1932 and 1933.

(For the constitution of the several regions, see page 6).

Region.	All Births.				Illegitimate Births.			
	Birth-rate per 1,000 Population.	Ratio to Rate for England and Wales, taken as 1,000 (Crude Rates).	Ratio of Actual Births per 1,000 of those which would have occurred had the Standard age rates been operating.	Ratio compared with that for England and Wales, taken as 1,000.	Birth-rate per 1,000 Population.	Ratio to Rate for England and Wales, taken as 1,000 (Crude Rates).	Ratio of Actual Births per 1,000 of those which would have occurred had the Standard age rates been operating.	Ratio compared with that for England and Wales, taken as 1,000.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1932								
England and Wales ..	15.3	1,000	964	1,000	0.67	1,000	974	1,000
Regional Summary—								
South-East	14.5	948	910	944	0.67	1,000	914	938
Greater London ..	14.6	954	890	923	0.65	970	830	852
Remainder of South-East.	14.3	935	945	980	0.69	1,030	1,074	1,103
North	15.9	1,039	998	1,035	0.70	1,045	1,018	1,045
North I	18.5	1,209	1,130	1,172	0.76	1,134	1,230	1,263
North II	17.0	1,111	1,119	1,161	0.96	1,433	1,487	1,527
North III	15.1	987	914	948	0.67	1,000	996	1,023
North IV	15.2	993	972	1,008	0.64	955	876	899
Midland	15.8	1,033	975	1,011	0.60	896	881	905
Midland I	16.0	1,046	1,002	1,039	0.58	866	836	858
Midland II	15.6	1,020	927	962	0.65	970	969	995
East	15.3	1,000	1,023	1,061	0.86	1,284	1,416	1,454
South-West	13.9	908	943	978	0.61	910	972	998
Wales	15.8	1,033	1,026	1,064	0.67	1,000	1,078	1,107
Wales I	16.2	1,059	991	1,028	0.59	881	987	1,013
Wales II	14.9	974	1,146	1,189	0.86	1,284	1,303	1,338
Density Summary of all Areas outside Greater London—								
County Boroughs ..	16.0	1,046	991	1,028	0.71	1,060	994	1,021
Other Urban Districts	15.0	980	945	980	0.61	910	927	952
Rural Districts ..	15.4	1,007	1,035	1,074	0.72	1,075	1,220	1,233
1933.								
England and Wales ..	14.4	1,000	906	1,000	0.63	1,000	936	1,000
Regional Summary—								
South-East	13.5	938	851	939	0.62	984	869	928
Greater London ..	13.5	938	822	907	0.60	952	789	843
Remainder of South-East.	13.7	951	900	993	0.64	1,016	1,020	1,090
North	15.0	1,042	941	1,039	0.65	1,032	963	1,029
North I	17.2	1,194	1,052	1,161	0.69	1,095	1,158	1,237
North II	16.0	1,111	1,049	1,158	0.89	1,413	1,420	1,517
North III	14.4	1,000	868	958	0.61	968	930	994
North IV	14.4	1,000	918	1,013	0.59	937	835	892
Midland	14.7	1,021	905	999	0.57	905	855	913
Midland I	14.8	1,028	928	1,024	0.56	889	833	890
Midland II	14.5	1,007	864	954	0.58	921	900	962
East	14.4	1,000	963	1,063	0.81	1,286	1,366	1,459
South-West	13.4	931	904	998	0.60	952	987	1,054
Wales	15.4	1,069	993	1,096	0.67	1,063	1,101	1,176
Wales I	15.7	1,090	963	1,063	0.58	921	977	1,044
Wales II	14.3	993	1,096	1,210	0.91	1,444	1,409	1,505
Density Summary of all Areas outside Greater London—								
County Boroughs ..	15.0	1,042	931	1,028	0.67	1,063	962	1,028
Other Urban Districts	14.1	979	891	983	0.57	905	891	952
Rural Districts ..	14.7	1,021	985	1,087	0.67	1,063	1,172	1,252

distribution is not significantly different from that of all births. The highest rates occur as a rule in the rural districts. It will be seen that whereas for all births the rural aggregate rate is 8.7 per cent. above the mean, for illegitimate only it is 25.2 per cent. above.

Sex Proportions at Birth.—Births of males in England and Wales in 1933 numbered 296,729 and those of females 283,684; the proportion of male to female births was 1,047, 1,021, and 1,046 to 1,000 for legitimate, illegitimate, and total births respectively. The corresponding proportions for total births in each year from 1893 onwards and in groups of years since the commencement of registration are shown in Table C (Part II). The extreme range during the last 50 years was from 1,032 per 1,000 in 1898 to 1,060 in 1919. During this period the highest ratio recorded prior to the war was 1,041 (in 1884, 1906 and 1909), which has also been the lowest point touched since 1919 (in 1926).

The extent to which different classes of area or portions of the country contribute to the preponderance of male births is shown in Table CXVIII. In 1931 the highest ratio, 1,073, occurred in the

Table CXVIII.—Male Births per 1,000 Female Births, 1931, 1932 and 1933.

	1931.	1932.	1933.
England and Wales	1,049	1,050	1,046
Regional Summary—			
South-East	1,047	1,046	1,044
Greater London	1,048	1,052	1,047
Remainder of South-East	1,046	1,036	1,039
North	1,045	1,050	1,048
North I	1,050	1,054	1,065
North II	1,072	1,036	1,055
North III	1,041	1,046	1,050
North IV	1,040	1,054	1,039
Midland	1,054	1,053	1,042
Midland I	1,052	1,048	1,040
Midland II	1,058	1,064	1,047
East	1,029	1,040	1,038
South-West	1,073	1,057	1,046
Wales	1,056	1,057	1,059
Wales I	1,060	1,054	1,044
Wales II	1,043	1,066	1,103
Density Summary of all Areas outside Greater London—			
County Boroughs	1,043	1,047	1,044
Other Urban Districts	1,057	1,050	1,052
Rural Districts	1,048	1,052	1,039

South-West, and the lowest, 1,029, in the East; in 1932, the highest 1,066, in Wales II, and the lowest, 1,036, in the South-East (excluding Greater London) and in North II; while, in 1933, the highest, 1,103, was in Wales II and the lowest, 1,038, in the East. The inconsistency of some of these ratios is illustrated by Wales II which was the highest in 1932 and 1933 and one of the lowest in 1931 and by the South-West which fell from 1,073 in 1931 to 1,057 in 1932 and to 1,046 in 1933.

STILLBIRTHS.

Stillbirths registered in England and Wales as a whole are shown for each year in Part II of the Statistical Review, Table B, and for each quarter in Table D. The numbers occurring in metropolitan and county boroughs, and in the aggregates of urban and of rural districts in administrative counties are shown in Part I, Table 18, to which is prefixed a summary for the several larger regions into which the country is divided.

In England and Wales the stillbirths registered during 1933 numbered 25,084 in all, 13,576 being males and 11,508 females; the numbers representing 41, 44 and 39 per 1,000 total births or 43, 46 and 41 per 1,000 live births respectively. The total compares with the figure of 26,471 recorded last year.

Prior to 1st July, 1927, the date on which stillbirth registration became operative in this country under the Births and Deaths Registration Act, 1926, the only record of stillbirths in England and Wales was that obtained from notifications received by Medical Officers of Health. These were published in the successive reports, from 1919 onwards, of the Chief Medical Officer to the Ministry of Health and were summarised in the 1927 Statistical Review. (Text p. 128.)

The distribution of the total according to sex, legitimacy and geographical incidence in 1932 and 1933 is summarised in rate form in Table CXIX: in this Table columns have been included from which comparisons may be made between the incidence of stillbirths on the one hand and that of live births or of infant mortality on the other. Wherever the numbers are large enough to form a satisfactory basis of fact, the frequency of stillbirth amongst males is shown to be definitely greater than it is amongst females. The male excess for legitimate births is almost the same as that of last year, and it is maintained with considerable uniformity throughout the several sections distinguished. For illegitimate births, also, male excess is usually found, but exceptions are recorded in 1933 in North II, North IV, Midland II and in both sections of Wales. As between legitimate and illegitimate births, the latter exhibit the higher rates in all sections (the males of Wales II excepted), the amount of the excess being on a somewhat larger scale than that indicated in the comparison between the sexes.

Table CXXIII shows for 1931-33 the rate of natural increase in various sections of the country, representing the combined effect of the several sectional birth and death-rates. Attention may be drawn to the large differences between the different sections of the regions, namely, North I (Durham and Northumberland), and North IV (Cheshire and Lancashire), and between Wales I (Brecknockshire, Carmarthenshire, Glamorganshire and Monmouthshire), and Wales II (the remainder of Wales). The figure for Wales II, 0·1 per 1,000, represents in the statistical sense an almost stationary population.

Table CXXIII.—Natural Increase per 1,000 living, 1931-1933.

	1931.	1932.	1933.
England and Wales	3·5	3·3	2·1
Regional Summary—			
South-East	3·4	3·0	2·0
Greater London	3·9	3·5	2·3
Remainder of South-East	2·9	2·3	1·7
North	3·2	3·4	1·9
North I	6·1	6·4	4·9
North II	4·2	4·5	3·0
North III	2·7	2·7	1·6
North IV	2·3	2·5	0·8
Midland	4·6	4·1	2·9
Midland I	4·7	4·2	3·0
Midland II	4·6	4·2	2·8
East	3·4	2·9	1·9
South-West	1·0	0·8	0·4
Wales	3·4	3·2	2·3
Wales I	4·5	4·2	3·0
Wales II	0·7	0·8	0·1
Density Summary of All Areas outside Greater London—			
County Boroughs	3·4	3·5	1·9
Other Urban Districts	3·1	2·9	1·7
Rural Districts	3·7	3·4	2·6

Table S, which provides an analysis of migration from 1911 onwards, shows that the balance of passenger movement, which for many years had been in the outward direction, has been reversed during the last four years. The net passenger movement into the United Kingdom was nearly 48,000 in 1933. This contrasts with about 77,000 in 1932 and 91,000 in 1931, and with an outward balance of 100,000 so recently as 1926.

GREAT BRITAIN AND IRELAND.

Population.—The first complete census of the United Kingdom was taken in 1821, when the population numbered 20,893,584 persons; during the 100 years 1821-1921 this number increased by about 126 per cent., the sum of the final census figures for

Table CXXIV.—Great Britain and Ireland. Vital Statistics. 1921-30, 1931, 1932 and 1933.

	Great Britain and Ireland.	England and Wales.	Scotland.	Northern Ireland.	Irish Free State.
<i>Estimated Population in the middle of the year 1933 (in thousands).</i>					
Males	23,863	19,357	2,364	618	1,524
Females	25,663	20,993	2,548	653	1,469
Persons	49,526	40,350	4,912	1,271	2,993
<i>Marriages.</i>					
1933	374,028	318,191	34,215	7,630	13,992
Persons married per 1,000 living :—					
1921-1930	14·9	15·5	13·8	12·1	9·5
1931	14·9	15·6	13·5	11·8	8·9
1932	14·6	15·3	13·6	11·0	8·8
1933	15·1	15·8	13·9	12·0	9·3
<i>Births.</i>					
1933	748,924	580,413	86,546	24,601	57,364
Per 1,000 living :—					
1921-1930	18·8	18·3	21·5	22·1	20·2
1931	16·5	15·8	19·0	20·5	19·3
1932	15·9	15·3	18·6	19·9	18·9
1933	15·1	14·4	17·6	19·4	19·2
<i>Deaths.</i>					
1933	620,006	496,465	64,848	18,154	40,539
Per 1,000 living :—					
1921-1930	12·5	12·1	13·7	15·1	14·5
1931	12·6	12·3	13·3	14·4	14·5
1932	12·4	12·0	13·5	14·1	14·5
1933	12·5	12·3	13·2	14·3	13·5
<i>Deaths of Infants under 1 year.</i>					
1933	49,681	36,960	7,019	1,960	3,742
Per 1,000 live births :—					
1921-1930	74	72	89	81	70
1931	69	66	82	73	69
1932	69	65	86	83	72
1933	66	64	81	80	65

Great Britain and of the estimated population of Ireland in June, 1921, amounting to 47,123,196. Up to the date when the 1931 Census was taken there was a further increase of 4 per cent. The populations of the several portions of the United Kingdom for each census year from 1821 and for individual years from 1894 are set out in Table A.

Marriages.—The marriages during the year 1933 numbered 374,003, corresponding to a rate of 15.1 persons married per 1,000 of the total population. This rate was 0.5 per 1,000 above the corresponding rate in 1932 and 0.2 above the average rate in the ten years 1921–1930.

Births.—The live births registered in the year 1933 numbered 748,984, and were in the proportion of 15.1 per 1,000 of the total population. This rate was 0.8 below the corresponding rate in 1932 and 3.7 per 1,000 below the average in the ten years 1921–1930.

Deaths.—The deaths registered in the year 1933 numbered 620,117, and were in the proportion of 12.5 per 1,000 of the total population. This rate was 0.1 per 1,000 above the corresponding rate in 1932, and was the same as the average in the ten years 1921–1930.

Infant Mortality.—The deaths of infants under one year of age during the year 1933 numbered 49,657, representing a rate of 66 per 1,000 live births. This rate was 3 per 1,000 below that recorded in 1932 and 8 per 1,000 below the average in the ten years 1921–1930.

BIRTHS AND DEATHS AT SEA.

Marine Register Book.—In accordance with the Births and Deaths Registration Act of 1874 and the Merchant Shipping Act of 1894, Commanding Officers of ships trading to or from British ports are required to transmit returns of all births and deaths occurring on board their ships to the Registrar-General of Shipping and Seamen, who furnishes certified copies of such returns to the Registrars-General of Births and Deaths for England, Scotland, Northern Ireland and the Irish Free State. Similar returns are furnished to the Registrars-General of Births and Deaths by Officers in command of His Majesty's ships. The returns of births and deaths at sea received by the Registrar General constitute the "Marine Register Book." During the year 1933 this register was increased by the addition of 59 entries of birth and 912 entries of death.

REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

Progress of Registration.—The names in the alphabetical indexes of births, deaths and marriages recorded in the national registers of England and Wales were increased during the year 1933 by 1,713,260, this addition raising the total of names in the indexes, which at the end of 1933 embraced a period of 96½ years, to 163,122,074 (Table T).

Searches and Certificates.—Besides the certified copies of the registered births, deaths and marriages kept in England and Wales pursuant to the Registration Acts, a large number of other registers and records are deposited in this Office under statute or other arrangement. A revised list of these various registers and records will be found on pages 149–155 of the Review for 1925. Searches may be made in any of these registers, and certificates obtained on payment of the prescribed fees.

Table CXXV affords an indication of the extent to which the copies of the records kept in this Office have been utilized by the public for legal evidence of births, deaths and marriages since 1866.

Table CXXV.

Years.	Total Searches.	Gratuitous Searches.	Searches paid for by Fees.	Certificates Issued.	Amount Received.
1866 (52 weeks) ..	12,135	—	12,135	10,017	£ 1,860 15 6
1875 (52 weeks) ..	26,356	—	26,356	20,282	3,879 15 6
1885 (52 weeks) ..	36,450	—	36,450	27,682	5,317 13 6
1895 (52 weeks) ..	53,289	—	53,289	35,727	7,200 12 6
1905 (52 weeks) ..	65,142	—	65,142	50,310	9,611 9 0
1906 (52 weeks) ..	64,340	—	64,340	49,429	9,458 6 0
1907 (52 weeks) ..	69,249	—	69,249	53,058	10,194 9 0
1908 (53 weeks) ..	72,370	—	72,370	54,870	10,550 8 0
1909 (52 weeks) ..	132,169	58,626*	73,543	54,674	10,568 8 0
1910 (52 weeks) ..	126,716	—	51,347	57,019	10,939 5 6
1911 (52 weeks) ..	140,496	65,491	75,005	56,347	10,875 6 0
1912 (52 weeks) ..	149,752	69,151	80,601	61,143	11,752 6 0
1913 (52 weeks) ..	150,540	71,225†	79,315	60,356	11,613 19 0
1914 (53 weeks) ..	188,040	104,593	83,447	65,817	12,482 11 6
1915 (52 weeks) ..	202,939	118,788	84,151	69,746	13,007 10 0
1916 (52 weeks) ..	303,334	197,669	105,665	88,265	16,379 17 0
1917 (52 weeks) ..	272,199	177,403	94,796	80,374	14,859 14 0
1918 (52 weeks) ..	255,462	146,504	108,958	90,898	16,889 0 0
1919 (52 weeks) ..	301,913	170,670	131,243	107,067	20,017 14 6
1920 (53 weeks) ..	284,194	149,447	134,747	108,684	20,415 0 0
1921 (52 weeks) ..	258,461	131,167	127,294	99,911	18,949 10 6
1922 (52 weeks) ..	263,047	143,088	119,959	90,400	19,028 12 6
1923 (52 weeks) ..	269,822	144,118	125,704	93,701	20,875 16 0
1924 (52 weeks) ..	337,521	178,990	158,531	121,890	27,109 15 0
1925 (53 weeks) ..	488,781	339,790	148,991	115,378	25,610 2 6
1926 (52 weeks) ..	541,916	407,687	134,229	105,560	23,305 6 6
1927 (52 weeks) ..	1,002,345	854,084	148,261	115,009	25,733 16 0
1928 (52 weeks) ..	600,678	452,953	147,725	114,731	25,678 17 0
1929 (52 weeks) ..	550,742	402,853	147,889	116,768	25,903 18 0
1930 (52 weeks) ..	1,207,344	1,053,047	154,297	121,549	26,964 12 0
1931 (53 weeks) ..	651,414	509,267	142,147	109,163	24,323 1 6
1932 (52 weeks) ..	598,624	464,985	133,639	104,420	23,086 13 0
1933 (52 weeks) ..	591,668	455,664	136,004	108,050	23,790 11 0

* Including some searches made in 1908.

† In addition, there were 91,917 gratuitous searches made for National Insurance Audit purposes.

The 455,664 gratuitous searches during 1933 comprise 42,103 searches made for the purpose of verifying the ages of persons aged 70 and upwards claiming old age (non-contributory) pensions and 214,432 for persons claiming pensions under the Old Age Contributory Pensions Acts, 1925 and 1929; 123,349 for verification purposes in connexion with claims to widows' and orphans' pensions under the Widows', Orphans', etc., Acts, 1925 and 1929; 32,619 to assist dependents of men of H.M. Forces to produce evidence of marriage and of the births of children in connexion with claims to naval and military pensions, separation allowances, etc., and to verify the ages of certain classes of youths and men in connexion with service in the Army, Navy and Air Force; 26,752 for verification of age, etc., in connexion with National Health and Unemployment Insurance; and 16,409 for other public purposes.

Offences against the Registration Acts.—In 1933 fifteen persons, on prosecution by order of the Registrar-General, were convicted of offences in connexion with registration. The offences for which convictions were obtained were as under:—

(a) For failing to register a birth	4
(b) For failing to re-register a birth under the Legitimacy Act	None
(c) Giving false information when registering a birth, stillbirth or death	8
(d) Giving false information for the purpose of procuring marriage	3

In addition to the above cases proceedings were taken and convictions obtained by the Director of Public Prosecutions in cases reported through the Registrar-General, the offences including those of false registration and making false declarations when giving notice of marriage.

RE-REGISTRATION OF BIRTHS UNDER THE LEGITIMACY ACT, 1926.

Under the Legitimacy Act, 1926, an illegitimate child of parents who married after the birth of the child was, subject to certain conditions, legitimated; and the Act contained incidental provision to enable the births of such children to be re-registered. During the year 1933 authority was issued for the re-registration of the births of 2,968 children, being 176 less than the preceding year. It is still difficult to speak with any certainty as to the normal figure to be expected in future years, as a large number of applications are not made shortly after the marriage of the parents but are postponed until the children's birth certificates are required on entering or leaving school or attaining the age of 21.

The number of authorities issued during each quarter is as follows:—

Quarter.	1927.	1928.	1929.	1930.	1931.	1932.	1933.
March	1,265	1,401	1,075	996	981	854	752
June	1,256	1,170	1,105	1,001	908	762	724
September	1,381	1,242	933	1,006	797	709	718
December	1,593	1,070	933	986	825	819	774
Totals	5,495	4,883	4,046	3,989	3,511	3,144	2,968

ADOPTION OF CHILDREN UNDER THE ADOPTION OF CHILDREN ACT, 1926.

The Adoption of Children Act, 1926, provided for the legal adoption of children by Order of the Court, and established a system of registration of such adoptions in an Adoption Register to be kept by the Registrar-General. The number of children whose adoption was registered during 1933 is 4,528. Table CXXVI furnishes an analysis of the Adoption Orders made by reference to the several classes of Courts and the quarterly distribution of the total figure.

PARLIAMENTARY AND LOCAL GOVERNMENT ELECTORS.

The returns of Parliamentary and Local Government Electors published in Tables U and V summarise the Register of Electors compiled under the Representation of the People (Equal Franchise) Act of 1928 in respect of the qualifying period of three months ending on the 1st June, 1933.

The particulars have been taken from statements furnished to the Registrar-General by the Registration Officers of the several

Table CXXVI.

Year.	Number of Adoption Orders dealt with.				Corresponding number of children, <i>i.e.</i> , Entries made in Adopted Children Register.				
	Total.	High Court.	County Court.	Court of Summary Jurisdiction.	Year's Total.	March Quarter.	June Quarter.	September Quarter.	December Quarter.
1927 ..	2,943	133	184	2,626	2,967	329	990	774	874
1928 ..	3,278	124	236	2,918	3,303	851	844	705	903
1929 ..	3,294	72	224	2,998	3,307	722	787	857	941
1930 ..	4,511	74	317	4,120	4,517	1,084	1,196	983	1,254
1931 ..	4,119	68	274	3,777	4,127	873	1,049	1,046	1,159
1932 ..	4,465	38	264	4,163	4,467	1,073	1,178	1,000	1,216
1933 ..	4,524	61	262	4,201	4,528	1,029	1,258	1,004	1,237

areas, or in the case of a University forming the whole or part of a University constituency, by the Chancellor, Registrar or other officer dealing with Parliamentary registration.

Registration Officers were instructed that the return of Parliamentary Electors should be the net total of individual Parliamentary Electors in each constituency, all duplicate entries being omitted from the count. In the case of Local Government Electors the number of names on the register was to be given. The instructions further directed that the names of "out voters" (that is, persons whose names appear twice in the Register, by reason of a claim under Rule 24 of the First Schedule to the 1918 Act) should be counted once only in respect of that qualification.

Table U refers to Parliamentary electors, and shows for each Parliamentary constituency in England and Wales, including the University constituencies, the numbers of males and females on the Register, and also the numbers registered in respect of business premises qualifications and the numbers on the absent voters list.

Table V refers to Local Government electors, and shows the numbers of each sex registered in respect of every local government area, *i.e.*, county borough, metropolitan borough, municipal borough, urban district and rural district in England and Wales.

The figures for the whole country are summarised in Table CXXVII and are shown in conjunction with the figures of previous Registers made since the passing of the 1918 Act.

Table CXXVII.—Parliamentary and Local Government Electors, 1918-1933.

Register.	Parliamentary Register (including University Constituencies).					Local Government Register.		
	Persons.	Males.	Females.	Business Premises Qualifica- tions.	Persons on Absent Voters' List (included in Cols. b-d).	Persons.	Males.	Females.
				Males only up to 1928. Persons from 1929 (included in Cols. b-d).				
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>h</i>
1918 (Autumn)	17,222,983	10,281,054	6,941,929	159,013	3,362,028	13,930,130	6,998,665	6,931,465
1919 "	17,465,638	10,234,887	7,230,751	205,461	1,157,061	14,361,123	7,176,019	7,185,104
1920 "	17,584,552	10,176,750	7,407,802	203,471	254,866	14,712,453	7,364,912	7,347,541
1921 "	17,795,784	10,237,344	7,538,440	194,737	185,227	15,019,348	7,527,861	7,491,487
1922 "	18,001,692	10,312,248	7,689,444	199,904	162,901	15,322,625	7,700,198	7,622,517
1923 "	18,388,833	10,488,179	7,890,654	208,694	151,953	15,691,962	7,873,461	7,818,501
1924 "	18,806,842	10,719,922	8,086,920	211,257	165,564	16,015,033	8,007,384	8,007,649
1925 "	19,167,275	10,897,545	8,269,730	217,509	167,406	16,345,290	8,157,607	8,187,683
1926 "	19,346,954	10,982,128	8,364,826	206,199	161,460	16,574,549	8,284,181	8,290,368
1927 "	19,585,972	11,094,031	8,491,941	205,538	155,436	16,865,666	8,444,718	8,420,948
1928 "	19,866,649	11,226,396	8,640,253	205,793	154,432	17,179,487	8,608,017	8,571,470
1929 (Spring)	25,095,793	11,866,784	13,225,999	371,594	174,731	18,620,395	8,825,225	9,795,170
1930 (Autumn)	25,730,507	12,101,108	13,629,399	364,762	174,270	18,879,147	8,905,768	9,973,379
1931 "	26,135,944	12,288,852	13,847,092	365,090	174,274	19,156,018	9,036,870	10,119,148
1932 "	26,439,713	12,440,109	13,999,604	367,684	172,234	19,418,156	9,160,409	10,257,747
1933 "	26,715,526	12,578,340	14,137,186	365,734	168,684	19,659,678	9,274,801	10,384,877

It will be observed that the sex distribution of the electorate which, in respect of the Parliamentary Register, was formerly in the proportion of about 1.3 men to each woman, was completely altered by The Representation of the People (Equal Franchise) Act of 1928. That Act, which placed women on the same footing as men in regard to the franchise, added about $4\frac{1}{2}$ million women to the Parliamentary electorate and nearly $1\frac{1}{4}$ million to the Local Government electorate, and as a consequence women now outnumber men by approximately 12 per cent. in the case of each. The somewhat abnormal increase in the male electorate between 1928 and 1929—an interval of six months, it should be noted, in place of the usual 12 months period—cannot be explained by the new Act which left the male franchise unaltered apart from a trifling addition—approximately 3,700—in respect of men registered in respect of their wives' occupation of business premises, and must be mainly ascribed to the special procedure, adopted for the first time in connexion with the 1929 register, of the universal service of a compulsory form of return which disclosed and made good omissions from the registers on the pre-1928 Act franchise.

Including a certain amount of plural representation in the case of those persons registered in more than one constituency by reason of their possessing the necessary residence or business qualification, or being entitled to be registered in respect of a University constituency, the total Parliamentary electorate of 26,715,526 represents 66.2 per cent. of the estimated total population, or 65.0 per cent. of the male and 67.3 per cent. of the female population; in the case of the rather more restricted Local Government franchise, the numbers are somewhat less and the proportions correspondingly lower, the total electorate being 48.7 per cent. of the whole population, or 47.9 per cent., and 49.5 per cent. in the case of males and females separately.

Of the total of the Parliamentary Registers, the bulk, *viz.* 26,617,720, represents the aggregate voting strength in the 509 geographical constituencies into which England and Wales is divided, the balance of 97,806 representing the five University constituencies. Eleven of the Boroughs, and three University constituencies, however, each return two members, so that the total representation in Parliament is by 528 members, 520 in respect of the geographical divisions, with an average electorate of 51,188 per member and eight in respect of the Universities, with an average electorate of 12,226.

MISCELLANEOUS.

Other tables appearing in Part II of the Statistical Review which have not formed the subject of special comment in the foregoing pages are:—

Table W, showing the Population, Births, Deaths, Infant Mortality and Marriages, with Rates in British Islands and Dominions, 1933.

Tables X and Y, showing the census populations respectively of the British Empire, Dominions, etc., and of Foreign Countries.

Appendix, showing changes in boundaries of various local government districts and the areas and populations involved.

WEATHER OF THE YEAR 1933. ENGLAND AND WALES.

The year 1933 was distinguished by an exceptional deficiency of rainfall. Other important features were the marked excess of sunshine, the unusual warmth experienced from March to October, the great snowstorm in February and the abnormal sequence of thunderstorms in June.

The percentage of the normal rainfall over England and Wales as a whole was 83. The year was not as dry as 1921 with 70 per cent. or 1887 with 74 per cent. but, since 1870, the only other comparable years were 1893 with 83 per cent. and 1870 with 82 per cent. February, March and October alone gave an excess of rainfall, the excess being marked in February (160 per cent.). The deficiencies were outstanding in August, November and December and the long sequence of dry months, from April to September inclusive, was exceptional. The total rainfall for the year exceeded the average only to the east of the Pennines from Sunderland to Goole and locally in Hampshire.

With regard to temperature, the year under review was noteworthy. Mean temperature exceeded the normal in all districts, the excess varying from 1.0° F. in the Channel Islands to 2.0° F. in north-east England. An unusually cold spell occurred from January 20th to 29th, while mean temperature for February was, on the whole, rather above the normal. There followed a sequence of eight warm months. March was excessively mild: at Greenwich there is no other March with such persistent warmth by day in a record which goes back to 1841 and at Southport no warmer March has occurred in 62 years' records. The outstanding feature of the summer months was the unusual warmth of the period June to September as a whole. As far as can be ascertained the mean temperature of the four consecutive months exceeded that of any other similar period since before 1881. The very mild weather lasted until 25th October. It was not, however, until about 25th November that really cold weather set in and continued until the end of the year. The persistent and severe cold in December, particularly in southern districts, was perhaps as striking as the exceptionally warm summer. At several places in the southern half of England it was the coldest December since 1890, and at some individual stations the deviation from the normal mean temperature was more than -7° F.

Sunshine was excessive, particularly from January to March and June to September. Over the country generally the total sunshine during June to September probably exceeded that of any four consecutive months since the similar period in 1911.

Further information.—Tables relating to meteorological elements are given in Part I (Tables 30-32). A description of the weather of each month appears in the Quarterly Return of the Registrar-General and a summary of the observations at Greenwich for each month of the year appears in Table XI of the Return for the fourth quarter.

Charts showing the distribution of pressure, temperature, sunshine and rainfall for the year, together with summaries of the observations at numerous stations will be found in the Annual Summary of the Monthly Weather Report issued by the Meteorological Office.

A list of the publications of the Meteorological Office will be found in "List M" issued by H.M. Stationery Office.

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Census of England and Wales

1931

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